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## **How Much do Hospitals Cost Shift? A Review of the Evidence**

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## **How Much do Hospitals Cost Shift? A Review of the Evidence**

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## **Abstract**

**Context:** Hospital cost shifting—that private payers are charged more in response to shortfalls in public payments—has long played a role in debate over health care policy. Though there is considerable theoretical and empirical literature on the subject, it has not been critically reviewed and interpreted since Morrissey did so nearly 15 years ago (Morrissey 1993, 1994, 1996). Much has changed since then, both in terms of empirical technique and in the health care landscape. In this paper I critically examine the theoretical and empirical literature on cost shifting since 1996, synthesize the predominant findings, suggest their implications for the future of health care costs, and put them in the current policy context.

**Methods:** Relevant literature was identified by database search. Papers providing descriptive policy context are considered first since policy shapes the health care market landscape within which cost shifting may or may not occur. Theoretical work is examined second as theory provides hypotheses and structure for empirical work. Then the empirical literature is analyzed in the context of the policy environment and in light of theoretical implications for appropriate econometric specification.

**Findings:** Analyses and commentary based on descriptive, industry-wide hospital payment-to-cost margins by payer provides a false impression that cost shifting is a large and pervasive phenomenon. More careful theoretical and empirical examinations suggest that cost shifting can and has occurred, but usually at a relatively low rate. Margin changes are also strongly influenced by the evolution of hospital and health plan market structures and changes in underlying costs.

**Conclusions:** Policymakers should take hospital and insurance industry claims of inevitable, large scale cost shifting with a grain of salt. Though a modest degree of cost shifting may result from changes in public payment policy, it is just one of many possible effects. Moreover, changes in the balance of market power between hospitals and health care plans also have a significant impact on private prices. Since they may increase hospital market power, provisions of the new health reform law that may encourage greater provider integration and consolidation should be implemented with caution.

**Keywords:** cost shifting, Medicare, hospital charges, health insurance, health policy

## 1.0 Introduction

The definition, existence, and extent of hospital “cost shifting” are points of debate among participants and stakeholders in discussions of health care policy and reform. The academic literature precisely defines the term and characterizes the range of its effect. Though that literature has grown considerably in recent years, not since the mid-1990s has it been systematically reviewed and summarized (Morrisey 1993, 1994, 1996; see also Coulam and Gaumer 1991). In this paper, I update those older reviews, summarize the relevant features of and changes to the health care policy landscape, and place the results in today’s policy context.

It is well-known that hospitals charge different payers (health plans and government programs) different amounts for the same service *even at the same point in time*, a phenomenon known to economists as “price discrimination” (Reinhardt 2006). It is also widely believed that hospitals charge more to one payer *because* it received less (relative to costs or trend) from another, a dynamic, causal process I’ll call “cost shifting,” following Morrisey (1993, 1994, 1996) and Ginsburg (2003), among others. Price discrimination and cost shifting are related but different notions. The first depends on differences in market power, the ability to profitably charge one payer more than another but with no causal connection between the two prices charged. In the second, there is a direct connection between prices charged. In cost shifting, if one payer pays less relative to costs (Medicare, say), another necessarily pays more (a private insurer, say). Cost shifting implies price discrimination but the existence of price discrimination does not imply cost shifting has occurred or, if it has, at what rate (i.e. how much did one payer’s price change relative to that paid by another).

That hospitals shift their costs among payers is intuitively appealing. Public payments—from Medicare or Medicaid—go down (again, relative to cost or trend, qualifiers I’ll omit hereafter) and, as a consequence, private payments go up, health insurance premiums along with them. Describing cost shifting, Karen Ignagni, President and CEO of America’s Health Insurance Plans (AHIP), said, “If you clamp down on one side of a balloon, the other side just gets bigger.” (Sasseen and Arnst 2009). It’s a simple hydraulic effect according to Dobson, DaVanzo, and Sen (2006): “[A]s some pay less, others must pay more.”

Is this intuition correct? Are costs immutable and simply shifted from one payer (that pays less) to another (that necessarily pays more)? If providers shift costs, by how much do they do so? When casually expressed or generously interpreted, the cost shift idea (defined above) leads one to conjure a dollar-for-dollar trade-off—a

dollar less paid by Medicare or Medicaid results in a dollar more charged to private payers. That level of cost shifting has been assumed in at least one recent health insurance industry-funded report (PWC 2009).

Some health care policy stakeholders have an interest in convincing policymakers that cost shifting is inevitable and large. Continuing the cost shifting assumption (and ignoring a countervailing one of profit maximization, to which I will return later), if public payments are relatively less generous than hospitals would raise private prices more than they would otherwise. In turn, premiums for policies offered by insurers and health care costs borne by self-insured firms would rise more quickly, making private purchase and sponsorship of health care coverage relatively more difficult for consumers and firms, respectively. Thus, convincing policymakers to be concerned about cost shifting aligns with the interests of the privately insured, employers, and the insurance and hospital industries, all of whom benefit from higher public payments so long as the cost shifting rate is nonzero. Individuals and firms would rather not spend more for care that cost shifting implies, insurance companies do not relish the pressure to charge higher premiums, and hospitals would prefer higher public payments for their services.

Of course, if costs could be shifted significantly, public payment policy would have little leverage on total health care costs. In that case, cost shifting amounts to price adjustments such that private payers largely subsidize public program payment shortfalls. Thus, the question of the extent of cost shifting is an important one. Is it dollar-for-dollar or is it less? If less, by how much? In other words, how much leverage does public payment policy have on total health care costs? How much does it influence private prices and premiums? For how much cross-subsidization does it account? The literature, as I will review, answers these questions.

From the literature several broad conclusions emerge that modify Morrisey's (1993, 1994, 1996) main finding that cost shifting was a small to nonexistent phenomenon. First, from theoretical considerations alone, the conditions necessary for cost shifting are possible but circumscribed. Cost shifting can occur but cannot always and forever be a large and persistent phenomenon. Second, the empirical literature finds that to the extent it has occurred at all cost shifting usually has done so at a low rate. The vast majority of shortfalls from public payers are accommodated by cost cutting not cost shifting. Third, private payment-to-cost ratios are influenced by many factors other than public payment rates. Thus, changes in the former cannot and should not always or fully be explained by changes in the latter. Fourth, the rate of cost shifting depends strongly on the

degree of price competition in the private market for hospital services, that is, the relative market power of hospitals and health care plans. A critical implication is that one cannot assume cost shifting estimates from one era or one market apply at another time or in another place. Fifth and finally, private and public prices and margins can both influence each other. In other words, the direction of causality between private and public payment levels goes both ways: they are jointly determined.

Beyond reviewing and organizing the literature, in this paper I make two other contributions. First, I provide a framework informed by theory for empirical specifications of hospital cost shifting analysis. In that framework I identify control factors and estimation techniques required to obtain unbiased cost shifting estimates. The second contribution is a critical examination of each empirical study in light of the framework just described. No study (on any subject) is perfect, but some are stronger than others. The stronger studies I identify provide the most credible estimates of hospital cost shifting and indicate how the phenomenon varies with market structure. Ultimately, by consideration of the full body of work—imperfect as each individual effort may be—robust conclusions, described above and returned to in the final discussion section, can be drawn.

It is worth noting that provision of care to the uninsured may also induce hospital cost shifting and affect private premiums, though estimates vary. Families USA (2005) estimated that private insurance premiums were about 10% higher in 2005 due to the use of health services by the uninsured. Kessler (2007) and Hadley et al. (2008) both find less than a 2% effect. The remainder of this paper focuses on hospital cost shifting from Medicare and Medicaid to private payers and does not cover that which may be due to the uninsured.

## **2.0 Background**

Cost shifting concerns have played a role in consideration of hospital payment policy for decades. According to Starr (1982), in the 1970s “commercial insurance companies worried that if the government tried to solve its fiscal problems simply by tightening up cost-based reimbursement, the hospitals might simply shift the costs to patients who pay charges.” A 1992 report by the Medicare Prospective Payment Assessment Commission (ProPAC) asserted that hospitals could recoup underpayments by Medicare from private payers (ProPAC 1992). Were that so, hospitals would need not need to fear inadequate government payments. Yet, somewhat paradoxically, around the same time hospitals used the cost shifting argument to call for higher public

payment rates (AHA 1989). More recently, during the debate preceding passage of the new health reform law—the Patient Protection and Affordable Care Act (PPACA)—two insurance and hospital industry-funded studies (PWC 2009, Fox and Pickering 2008) and one peer-reviewed publication (Dobson et al. 2009) reasserted a high degree of cost shifting to private payers stemming from public payment shortfalls. Half to all of shortfalls were assumed to be shifted to private payers.

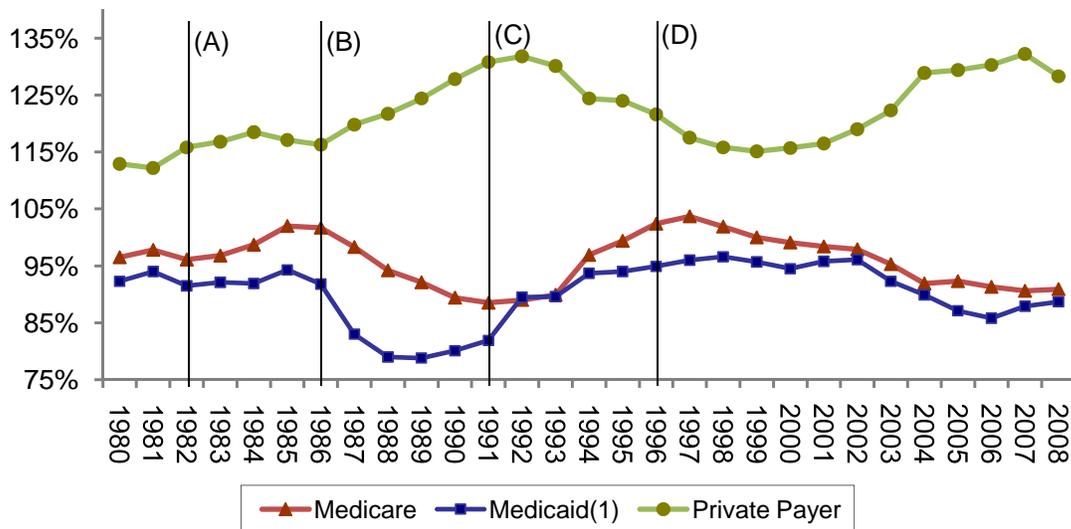
The cost shifting issue is certain to arise again in the near future. Though cost shifting was debated during consideration of the PPACA, public payment policy is not settled, nor will it ever be. The new health reform law includes many provisions that are designed to reduce the rate of growth of public sector health care spending. For instance, the law's provisions will reduce annual updates in payments for Medicare hospital services, pay for them in part based on performance on quality measures, lower payments for preventable hospital readmissions and hospital-acquired infections, among others (Kaiser Family Foundation 2010, Davis et al 2010). In aggregate and over the ten-year period 2010-2019, the CBO scored the savings from reduced Medicare hospital payments at \$113 billion (CBO 2010b).

Additionally, Medicaid eligibility will expand in 2014 to all individuals with incomes below 133% of the federal poverty level. The Congressional Budget Office has estimated that by 2019 Medicaid enrollment will grow by 16 million individuals (CBO 2010a). To the extent that some of these new Medicaid beneficiaries would have otherwise been covered by private plans (a crowd-out effect; Pizer, Frakt, and Iezzoni 2010), lower Medicaid payments relative to private rates may increase incentives to shift costs. On the other hand, to the extent that Medicaid expansion, as well as the equally large (CBO 2010a) expansion of private coverage encouraged by the PPACA's individual mandate and insurance market reforms, decrease rates of uninsurance and uncompensated care, the law may decrease hospitals' need to shift costs. Nevertheless, if past experience is any guide, as some of PPACA's provisions are implemented, they are likely to be challenged with cost shifting arguments by the hospital and insurance industries.

Much of the commentary in the literature pertaining to public and private payments to hospitals and their relationship references time series such as those depicted in Figure 1 (see, for example, Mayes and Hurley 2006; Mayes 2004; Dobson, DaVanzo, and Sen 2006; Lee et al. 2003; Zwanziger and Bamezei 2006). Aggregate payment-to-cost ratios for all hospital-based services financed by private payers, Medicare, and Medicaid for

years 1980 through 2008 are illustrated. Except, perhaps, over the period 1980-1985, the private payment-to-cost ratio is negatively correlated with those of public programs. This is suggestive of cost shifting, but other hypotheses are consistent with the evidence; it may be coincidental or driven by other factors. As suggested in the subsections that follow, much of it may be explained by changes in hospital costs and hospital or plan price setting power due to market size, reputation, and other factors relating to “market clout.”

**Figure 1: Aggregate Hospital Payment-to-Cost Ratios for Private Payers, Medicare, and Medicaid, 1980 – 2008**



Source: AHA (2003, 2010).

(1) Includes Medicaid Disproportionate Share payments.

(A) = Beginning of Medicare Hospital Prospective Payment System (PPS) phase-in, (B) = PPS fully phased in, (C) = Era of commercial market managed care ascendancy, (D) Balanced Budget Act (BBA) passage and managed care backlash.

In Figure 1, the years 1980-2008 are broken into five spans of time by four lines marked (A) through (D). These five eras correspond to periods over which health care market structure (hospital and plan market power) and policy landscape had distinct characteristics. Those characteristics changed at each of the demarcated boundaries by identifiable legislative or market events. In the subsections that follow, I describe those eras and events. They form the contextual backdrop to my review of the cost shifting literature, my interpretation of it, and help inform my qualitative predictions of future developments in response to likely policy changes. In the

discussion that follows, I focus on Medicare policy and payment changes. Medicaid payment in relationship to costs tends to track Medicare payments as can be seen in the figure.

## **2.1 The Golden Stream (before 1983)**

Policymakers have struggled with Medicare financing since the early years of the program. The original hospital payment design reimbursed hospitals retrospectively for all services at their reported costs plus 2% for for-profits and plus 1.5% for non-profits (Weiner 1977). These so-called “return on capital” payments were eliminated in 1969 (U.S. Senate 1970). The cost reimbursement system that replaced them included a so-called “nursing differential” that paid hospitals an additional 8.5% above inpatient nursing costs (Kinkead 1984). The 8.5% nursing differential was reduced to 5% in 1981 (SSA 1983) and eliminated altogether by 1984 (Inzinga 1984). Thus, from the inception of the program into the 1980s hospitals could earn greater Medicare revenue and profit simply by increasing reported costs or a portion thereof (inpatient nursing costs in the case of the nursing differential) (Mayes 2004).<sup>1</sup> With no incentives for cost containment by hospitals, the system was described as “a license to spend, ... a golden stream, more than doubling between 1970 and 1975, and doubling again by 1980” Stevens (1989).

Meanwhile, indemnity plans were the norm in the private sector. Without the leverage of network-based contracting (in which some providers could be excluded) and with payment rendered retrospectively on a fee-for-service basis, no successful cost controls existed in the private sector either. Managed care<sup>2</sup> was unheard of until 1982. In that year California passed a law that allowed health insurance plans to selectively contract with hospitals, a statute that was widely emulated elsewhere sowing the seeds for the cost control role played by managed care in the 1990s (Bamezai et al. 1999).

Thus, prior to 1983, attempts by public and private payers to control hospital costs were largely unsuccessful. In general, both rose over time, consistent with the positive correlation between the two that persisted until about 1985 and evident in Figure 1. In the relationship between hospitals and their payers,

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<sup>1</sup> One possible reason that Medicare payment-to-cost ratios are below 100% in Figure 1 between 1980 and 1983 despite the “cost plus” reimbursement methods may be that hospital cost inflation was increasing rapidly and reimbursements were based on lagged costs (Mayes 2010).

<sup>2</sup> Following Zwanziger, Melnick, and Bamezai (2000), among others, throughout this paper, I use the term “managed care” to refer to plans’ selective contracting arrangements rather than their case-by-case control of utilization. The former has an impact on prices (Glazer and McGuire 2002). The latter has an impact on costs by control of volume and service type (Gray and Field 1989).

hospitals had the lion's share of power. Price competition did not exist and hospitals attracted physicians and patients with costly, non-price amenities and services (Bamezai et al. 1999).

## **2.2 Incentive Reversal (1983-1987)**

With a goal of reducing domestic spending, the Reagan Administration targeted Medicare hospital payments. Then Health and Human Services Secretary Richard Schweiker became enamored of New Jersey's hospital prospective payment model, based on diagnosis-related groups (DRGs), and developed Medicare's system accordingly (Mayes 2004). Under Medicare's prospective payment system (PPS), each hospital admission was assigned to one of almost 500 DRGs, each of which was associated with a weight based on average costs of treating patients in that DRG in prior years. The payment to a hospital for an admission was the product of the DRG weight and a conversion factor. Medicare could (and did) control the amount of payments to hospitals by adjusting the growth rate of the conversion factor and/or adjusting the relative DRG weights (Cutler 1998).

The critical element of the PPS is that prices were set in advance of admissions (i.e., prospectively), putting hospitals—not Medicare—at financial risk for the cost of an admission. Rather than paying hospitals more if they did more, as the prior system had, the PPS encouraged them to do less, and pocket any surpluses of prices over costs. The reversal of incentives was designed to control costs and the conversion factor and DRG weights were the policy levers for doing just that.

The PPS phased in over four years. Hospitals quickly learned how to reduce lengths of stay and, thereby, costs. Since PPS payments were based on historical costs, the early years saw a spike in aggregate payment-to-cost ratios, evident in Figure 1 (Coulam and Gaumer 1991).

## **2.3 Medicare, Congress's Cash Cow (1987-1992)**

By 1987, the PPS was fully phased in and Congress began using its policy levers to extract huge savings from Medicare and apply them to deficit reduction. The legislative mechanism was the annual budget reconciliation process. Robert Reischauer, Congressional Budget Office director from 1989-1995, explained how the PPS was viewed and used by Congress:

*Medicare was the cash cow! [...] Congress could get credited for deficit reduction without directly imposing a sacrifice on the public. . . . And to the extent that the reduction actually led to a true*

*reduction in Medicare services, it would be difficult to trace back to the Medicare program or to political decision-makers. (Mayes 2004)*

Aggregate Medicare hospital payment-to-cost ratios fell every year from 1987-1992 because hospital did not restrain costs as quickly as payments were adjusted (Guterman, Ashby, and Greene 1996). As Medicare margins fell, private pay margins grew over this period. The effects of managed care had not yet been fully felt in the commercial market, leaving private purchasers vulnerable to hospitals' market power. If ever there was an era during which the market conditions were ripe for cost shifting, this was it.

#### **2.4 The Ascendency of Managed Care (1992-1997)**

The role of market power in price setting is made crystal clear by considering the experience of the 1990s. The business community, desperate to put an end to the annual double-digit percent increases in premiums, changed course, removing traditional indemnity plans from their offerings and encouraging the growth of managed care. Managed care plans covered the majority of private plan enrollees beginning in 1993 (51%) and grew rapidly thereafter, capturing 70% of the market by 1995 (Mayes 2004). Robert Winters, head of the Business Roundtable's Health Care Task Force from 1988 to 1994, said,

*What happened in the late 1980s and in the early 1990s, was that health care costs became such a significant part of corporate budgets that they attracted the very significant scrutiny of CEOs. . . . More and more CEO's [were] saying, 'Goddammit, this has to stop!' (Mayes 2004)*

What stopped it was network-based contracting. The willingness for plans and their employer sponsors to exclude certain hospitals from their networks enhanced plans' negotiating position. To be accepted into their networks, hospitals had to negotiate with plans on price. The balance of hospital-plan market power shifted, resulting in the 1992-1997 downward private payment-to-cost ratio trend illustrated in Figure 1.

By contrast, payment-to-cost ratios for public payers grew in the early 1990s. This isn't a (reverse) cost shifting story, however, because there is no evidence that public payments increased in response to decreasing private ones. Instead, the dynamics are better explained by changes in cost. Guterman, Ashby, and Greene (1996) report that growth rates of hospital costs declined dramatically in the early 1990s, from above 8% in 1990 to below 2% by mid-decade, perhaps due to the pressures of managed care, a point echoed and empirically substantiated by Cutler (1998). The rise of hospital costs continued at low rates through the 1990s, averaging just 1.6% per year between 1994 and 1997. By contrast, Medicare payments per beneficiary to hospitals, which

had been partially delinked from costs under the PPS, increased 4.7% per year (Mayes and Hurley 2006). That the movements in the time series of Figure 1 confound the effects of price and cost is a second way—along with obscuring market power effects—they give a false impression of large, pervasive cost shifting. Put simply, there are many ways for public and private payment-to-cost ratios to change and the causal connection between prices (cost shifting) is just one of them.

## **2.5 The Managed Care Backlash and the BBA (1997-2008)**

With so much room for costs to fall, managed care plans profited relatively easily for several years, negotiating with hospitals to accept lower payment increases and reducing hospital use among subscribers (Reinhardt 1999). Plan profitability fell throughout the 1990s, however, as price competition among plans squeezed inefficiencies and surplus from the system. In an attempt to maintain profitability, plans imposed greater restrictions on enrollees, subjecting them to more stringent utilization reviews, tighter networks, elimination of coverage for certain services, and higher cost sharing (Rice 1999, Mayes and Hurley 2006).

These cost-saving measures became increasingly unpopular and a managed care backlash ensued. States and the federal government enacted managed care reform and consumer protection laws (Soriano and Feder 1999). By 1997 the era of managed care's strong restraints on cost had ended and with it the low premium increases they delivered earlier in the decade. America entered the current age of health care plans, in which less restrictive network contracting embodied in the preferred provider organization (PPO) became the norm. Plans and hospitals still negotiate on price, but with consumers disliking restrictions on choice of providers, leverage shifted away from plans and toward hospitals. Reinforcing this shift, hospital mergers increased in the late 1990s (Vogt 2009). By the turn of the century, private payment-to-cost margins began to increase.

Coincidental with popular rejection of managed care, Congress turned its attention to the budget deficit and again sought savings from Medicare. The 1997 Balanced Budget Act (BBA) was enacted, promising \$115 billion in Medicare savings over the 1998-2002 period by eliminating retrospective cost-reimbursement for post-acute care, long-term hospital services and for hospital outpatient departments (Wu 2009). Thus, hospital Medicare payment-to-cost ratios declined as those of private payers increased, but perhaps only coincidentally. The latter was facilitated by a shift in market power, the former by policy change. The extent to which they are causally related cannot be determined from Figure 1 alone.

In summary, Figure 1 reveals a negative correlation between public and private payment-to-cost ratios since 1985. This suggests cost-shifting but doesn't prove it. Other hypotheses are consistent with the evidence. Historical changes in hospital costs and the balance of market power between hospitals and plans may explain all or some of the data. Only careful empirical analysis can reveal the causal effect of public prices on private ones, free of the confounding effects of changes in market power and hospital practices that impact costs.

### **3.0 Methods**

To identify studies providing empirical analysis of cost shifting or theoretical predictions of the phenomenon, I used Google Scholar to search the academic literature from 1996 to the present with the search string: health (payment OR rate) (Medicare OR Medicaid) "cost shift". Over 600 documents satisfied the search criteria, from which I selected only those that were not included in the review by Morrisey (1996), appeared in peer-reviewed journals, offered either theoretical treatment of or attempted to estimate the size of a cost shifting effect. The list was augmented by any relevant papers published in 1996 or later cited by or citing those found in the Google Scholar search and meeting the aforementioned criteria. Though papers pertaining exclusively to nursing home and physician cost shifting were included in this list, they are not part of this review.

The final set of papers relating to hospital cost shifting is listed in Tables 1 and 2. Table 1 lists those that provide theoretical developments and Table 2 lists those with empirical findings. Some papers include both and, so, appear in both tables.

### **4.0 Cost Shifting Theory**

My purpose in reviewing cost shifting theory is to identify non-price factors potentially relevant to the phenomenon. Such factors should be considered in empirical studies (reviewed in Section 5) if they are to provide an unbiased estimate of cost shifting. Section 4.1 illuminates the role of hospital and plan market power and the implications of an assumption that hospitals engage in profit maximizing behavior regarding costs and prices. Section 4.2, considers what can happen when hospitals maximize something other than profit (generically termed "utility maximization"). Literature identified in my survey and referenced in these subsections is summarized succinctly in Table 1 (next page).

<b>Table 1. Theoretical Cost Shift Literature (1996 to Present)</b>			
Citation	Assumptions	Predictions	Implications for Empirical Estimates
<i>Studies Assuming Profit Maximization by Providers</i>			
Rice et al. (1999), Showalter (1997)	Provider profit-maximizing behavior.	Cuts in public payments lead to lower quantity of care supplied to the public, a higher quantity supplied to private payers, and a lower private payer price.	Cost shifting is not expected if providers maximize profit.
Glazer and McGuire (2002)	Medicare sets prices independent of quality and must pay any willing qualified provider. Private payers negotiate quality-dependent prices and selectively contract. Provider quality is shared across payer types.	The presence of a private sector dilutes Medicare payment changes and can repair Medicare payment policy errors. Medicare can free-ride on private payers, receiving higher quality than that for which it pays.	A private payer's ability to exclude providers from its contract is a key source of bargaining power. Medicare's payment level may depend on factors (e.g. quality) correlated with private payer levels (i.e. may be endogenous). Public/private payer mix is a determinative factor in the extent providers respond to Medicare payment changes.
Stensland, Gaumer, and Miller (2010)	Hospitals with strong financial resources have a high cost structure.	A high degree of hospital market power leads to high private prices and donations. These strong financial resources are associated with a high cost structure which is responsible for low Medicare margins.	Provider market power and costs are positively correlated with private payments.
<i>Studies Assuming Utility Maximization by Providers</i>			
Clement (1998), Zwanziger (2000)	Hospitals maximize a utility function with profit and quantity components.	Cost shifting is possible if hospitals have under-exploited their market power.	Measures of public and private payer volume (or one relative to the other) are related to cost shifting behavior.
Cutler (1998)	Hospitals do not maximize profit.	Cost shifting and cost cutting are both expected responses due to public payment reductions. When insurer demand elasticity for hospital services is low, more cost shifting can occur.	Since cost cutting is a possible response to public payment reductions, cost shifting analysis based on margins confounds price and cost effects.
Rosenman, Li, and Friesner (2000)	Hospitals maximize prestige (revenue subject to the constraint it covers costs).	Cost shifting may occur, depending on the provider's ability to cut costs. More public payers relative to private ones increases the degree of cost shifting.	Public/private patient mix and grants are relevant to cost shifting.
Friesner and Rosenman (2002)	Hospitals maximize prestige (revenue subject to the constraint it covers costs).	Cost shifting and lower service intensity are substitute responses and should occur under similar circumstances	Service intensity is related to cost shifting.

#### 4.1 Market Power and Profit Maximization

One formalization of cost-shifting theory is concerned with a health care provider that treats patients of two types, “public” and “private.” These two types differ in their health coverage by entities with distinct contracting and payment practices. Public payers set provider payments by fiat and accept any willing provider. Traditional Medicare is the prototypical public payer, though state Medicaid programs have similar characteristics. Private payers negotiate payments with providers using their ability to selectively contract (form contracting networks) with a subset of them as a source of negotiating power. A managed care company is the prototypical private payer (Glazer and McGuire 2002).

This distinction highlights the role of “excludability” in hospital price setting. Hospitals in markets for which good substitute hospitals exist for their services are subject to exclusion from payers’ contracting networks. This is a source of leverage for health plans and drives private prices downward. In contrast, hospitals that plans have difficulty excluding from their networks because of prestige or some distinctive “must have” characteristic can exercise brand power and negotiate high prices from plans. Similarly, a hospital with a local monopoly (due, say, to great distance to the closest competitor) is not excludable from plans’ networks, driving prices upward for that hospital. Hospitals operating near full capacity can also demand higher prices (Ho 2009).

Market power among firms that offer insurance and/or administer self-insured employer plans also plays a role in private prices. For example, a firm that commands a large share of the market will also have a large degree of power in negotiating the price of health care services. Even a relatively large hospital cannot afford to be excluded from the network of a dominant plan, a phenomenon that pushes prices paid to hospitals downward. In such a case, provided there is some competition among hospitals, there is little to no scope to increase prices charged a dominant plan. Such a plan would walk away from a hospital trying to do so and contract with a competitor hospital instead (Morrisey 1996). The ability to price discriminate (charge one payer more than another) depends on a hospital’s market power *relative* to that of each of its payers.

Thus, hospital prices are set through a bargaining process between hospitals and plans (Ho 2009, Moriya, Vogt, Gaynor 2010). Though market power of these two entities is relevant to the price-setting process, the precise relationships between plan and hospital market power on the one hand and price discrimination by hospitals across payers and its consequence for commercial premiums on the other are complex and not fully

understood in detail. There is general agreement in the health economics community about the key principles and qualitative relationships among relevant factors, however (Frakt 2010).

One such principle, explained in the Introduction, is that the ability to price discriminate is necessary but not sufficient for cost shifting. Since price discrimination is driven by market power, a necessary but not sufficient condition for hospitals to shift costs from public to private payers is that hospitals possess market power relative to plans. Market power cannot profitably be wielded indefinitely. Once a hospital has fully exploited its market power it has exhausted its ability to extract additional revenue from further price increases. That is, an even higher price would drive away enough customers (plans) that revenue would decrease, not increase.

Thus, cost shifting requires a change in the degree to which hospitals exercise market power. To shift costs, a hospital must have untapped market power. That is, it must have an *ability* to price discriminate to an extent not fully exercised. If it then exploits more of its market power *in response* to a shortfall in payment from public programs, only then has it shifted costs. Once it has exploited all the market power it has, a hospital cannot shift costs further because it cannot further price discriminate. This is why an assumption of profit maximization on the part of hospitals leaves no room for them to shift costs. If profits are at a maximum, they can only go down if prices are increased and patients begin going elsewhere in response (Morrisey 1996).

Most economists reject the possibility of cost shifting by appealing to a profit maximization assumption (Morrisey and Cawley 2008). With a multi-payer model of prices and quantities (number of patients served or units of health care sold), Showalter (1997) shows the consequences of such an assumption. When public payers cut price per patient to a hospital, that hospital re-computes what it charges each payer to maximize profit. The new set of prices is one for which quantity supplied to the public payer is lower, a simple result of supply and demand: a shift downward in price offered translates into lower number of patients served. A greater capacity is then available to serve more private patients. To fill that capacity (i.e. attract more patients from health plans), the hospital must lower its per patient private price, again a simple consequence of supply and demand. Thus, in response to lower public payments, profit maximization predicts a *volume shift* (lower public volume, higher private volume) and a price spillover (lower private payments as well). This is the antithesis of the cost shifting theory (Rice et al. 1999; McGuire and Pauly 1991). Morrisey (1993, 1994, 1996) points out that such a response is also expected for non-profit hospitals that seek to maximize revenue in service to charitable work.

So far we've considered the theoretical response of private prices and volumes to a change in public prices. However, it's plausible that causality runs the other way—that public prices respond to private ones. Glazer and McGuire (2002) propose such a dynamic. They imagine that all payers share the same level of quality from each provider, assumed to be profit-maximizing. Knowing this, public payers benefit from the quality private payers demand. By strategically underpaying, public programs “free ride” on private payers, getting more quality than they pay for. For example, high private prices fund the quality from which Medicare patients also benefit. In turn, Medicare pays rates that do not support the level of quality its beneficiaries receive. In this way, higher private rates can cause lower Medicare ones, a cost shift but in the opposite direction normally assumed.

Another result of the Glazer and McGuire (2002) model is that the degree to which a profit-maximizing provider responds to Medicare payment changes is a function of its public/private payer mix. A greater share of private payments dilutes whatever effect on quality public payment policy shift might have. The greater share of public patients, the more leverage public payment policy changes exert.

Wu (2009) terms the “reverse causality” story of Glazer and McGuire (that public prices respond to private ones) a “strategy” hypothesis in the sense that public payers behave strategically in setting prices. In contrast, she dubs the more standard story—that hospitals with unexploited market power can raise prices—as the “market power” hypothesis. The two hypotheses suggest a different consequence of payer mix. Under the market power hypothesis, hospitals with a larger share of private patients would cost shift more because of their greater bargaining power. On the other hand, the strategy hypothesis suggests that hospitals with a larger share of private patients would cost shift less because they are less sensitive to (less reliant on) public payments.

Stensland, Gaumer, and Miller (2010) provide another mechanism by which public payer based hospital margins are a response to private payer based revenue. They imagine a hospital with high market power that commands high markups over marginal costs. This permits a relaxed attitude toward cost, allowing them to rise. (Alternatively, it could be the high cost structure is itself a factor in high market power, perhaps due to high quality.) High costs will cause Medicare margins to be negative.

In conclusion, the literature on cost shifting theory based on profit maximization is unambiguous. Cost shifting cannot exist if hospitals already maximize profit. However, if they do not fully exploit their market power, theory suggests that the scope for cost shifting is still related to their degree of market power, as well as

costs and quality, public/private payer mix, and plan market power. In addition, there are reasons to think that private payment levels influence public payments. Together these theories suggest the possibility that causality runs both ways: shifts in public payments may cause shifts in private payments *and* vice versa.

Though we've already touched on the implications for cost shifting if hospitals do not maximize profit, next I consider theories that attempt to explain what they may be maximizing instead.

#### **4.2 Utility Maximization**

Eighty-five percent of beds in community hospitals are in non-profit or public institutions (Ginsburg 2003). There is nothing that says non-profit hospitals cannot charge profit maximizing prices to some payers. They may do so, for example, in order to maximize resources for charitable purposes. In such a case, there is no scope for cost shifting (Morrisey 1993, 1994, 1996). On the other hand, non-profit hospitals can be guided by vague missions and influenced by stakeholders with differing objectives. Consequently, they may not consistently maximize anything (Ginsburg 2003). In this section I consider the case in which hospitals do not maximize profit but do maximize a combination of other well-defined factors (generically termed a "utility function").

First, it is worth noting that non-profit and for-profit hospitals compete. In competition, the presence of for-profit hospitals may encourage non-profits to improve efficiency and cut costs. Likewise, the presence of non-profits may induce for-profits to increase trustworthiness or quality (Kessler and McClellan 2001, Schlesinger et al. 2005). However, competition does not fully eliminate the differences between for- and non-profits in terms of provision of uncompensated care, accessibility, quality, and trustworthiness (Schlesinger and Gray 2006).

Clement (1997/1998), citing prior work in agency theory, argues that both non- and for-profit hospitals maximize utility functions with both profit and quantity components. She therefore assumes a hospital strategy governed by a model developed by Dranove (1988) for which the hospital maximizes utility with both quantity and profit components over two payers. Such a model allows for the possibility of cost shifting, provided the hospital has underutilized market power and sets prices commensurately lower than the market could profitably bear. Since volume is a component of the utility function, this result is intuitive: lower prices lead to higher volume so a hospital can maximize utility without fully exploiting market power and maximizing profit. Like Clement (1997/1998), Zwanziger, Melnick, and Bamezai (2000) also develop a theoretical model similar to that of Dranove (1988), one that assumes hospitals maximize utility that depends on profits and volume. They also

show that cost shifting is possible. The theoretical work beginning with Dranove and further developed by Clement, Zwanziger, Melnick, and Bemezai all show that measures of patient volume ought to be considered as independent variables in the specification of an empirical model of hospital prices.

Rosenman, Li, and Friesner (2000) hypothesize that non-profit hospitals maximize prestige. They suggest this is done by maximizing revenue subject to the constraint that it covers costs. The authors show that doing so can lead to either cost shifting (high private prices and lower private volume) or the opposite (lower private prices and higher private volume) in response to lower public payments. Which will occur depends in part on the provider's ability to cut costs. The theory also predicts that payer mix is important. More public pay patients relative to private pay patients can increase the degree of cost shifting. Friesner and Rosenman (2002) provide a similar a model of hospital prestige maximization. They predict that cost shifting and lower service intensity are substitute responses and should occur under similar circumstances.

Cutler (1998) provides an intuitive, graphical depiction of a theory of non-profit hospital price setting under utility maximization. He shows that cost shifting and cost cutting are both expected when public payments to hospitals are reduced. The extent to which each is employed depends on the degree to which plans have power to exclude hospitals from their networks. Cost shifting requires a private sector with relatively low ability to do so (inelastic demand). As the ability to exclude hospitals increases (demand becomes more elastic), hospitals respond more with cost cutting than cost shifting. Hence, cost shifting analysis based on margin (revenue divided by cost) has the potential to confound changes in price with changes in cost.

In summary, the literature on cost shifting assuming utility (not merely profit) maximizing behavior by hospitals suggests that cost shifting is possible. The degree to which it occurs is expected to be related to public/private patient mix, changes in costs, and service intensity. An implication is that there are theoretical reasons to expect a hospital can cost shift if it does not maximize profit or revenue from private payers.

## **5.0 Review of the Empirical Literature**

The literature identifies many possible hospital responses to decreases in public payments. They include (1) reduction in staff or wages, (2) reduction in (underutilized) capacity, (3) changes in quality, (4) reduction in services (trauma center, emergency rooms), (5) reduced diffusion rate of technology, (6) closure, (7) upcoding

diagnostic information to get higher payments from Medicare, (8) volume shifting, and (9) cost shifting (Cutler 1998, Dranove and White 1998, Tai-Seale, Rice, and Stearns 1998, Dafny 2005). Given all these possible responses and in light of the relatively narrow range of circumstances in which cost shifting can theoretically occur (as reviewed in Section 4), it is not surprising that the empirical literature shows that cost shifting does not usually completely offset public payment shortfalls. With one exception, all studies find no cost shifting or a level of it that is far below dollar-for-dollar. The exception is that Cutler (1998) finds dollar-for-dollar cost shifting for the period 1985-1990. However, for the period 1990-1995 he finds no evidence of cost shifting. The strongest study (Wu 2009) finds an average 21% cost shift rate for the 1996-2000 period.

The review of empirical literature below and summarized in Table 2 is organized as follows. First, I consider studies that measure prices across hospitals but not over time. Results from these cross-sectional studies are often taken as evidence of cost shifting, but because they are a snapshot in time they are really studies of price discrimination, a static phenomenon. Cost shifting is a dynamic relationship between prices, so must be studied with data that include variation over time, not just across institutions. Next, I consider two types of dynamic studies that exploit temporal as well as cross-sectional variation in prices. One type, fixed-effects specifications, measure price changes relative to an overall hospital-specific average. The other, difference models measure price changes relative to a baseline year or a prior year. Both fixed-effects and difference models use hospitals as their own controls. They are distinct and equally valid approaches (Wooldridge 2002).

One study (Gowrisankaran and Town 1997) estimates a model that is outside the typology of studies just explained. Using Current Population Survey data, hospital cost report data from the Health Care Financing Administration (now the Centers for Medicare and Medicaid Services), and American Hospital Association data (all from 1991), the authors estimate a detailed (structural) model of the inpatient hospital market. The model captures dynamics of a hospital industry in which for- and non-profits compete and maximize different utility functions, have different preferences for investment, and face different levels of taxation. For-profits maximize profits while non-profits maximize a mix of profits and quality. The model includes the effects of hospital entry, exit, investment, and multi-payer pricing decisions, as well as patient preferences for hospitals. Observable input parameters included proportion of patients requiring hospital services by payer, income threshold for free care, co-payment, Medicare deductible, Medicare reimbursement rate, corporate tax rates, and the discount rate.

The model is used to simulate the effects of Medicare's 1984 switch from a retrospective cost-based to a prospective payment system for hospital services. The authors find that the new payment system resulted in a 10% reduction in quality and a 1% decline in private price due to more concentrated hospital markets. The authors characterize this as a cost shift in the sense that price per unit of quality increased.

### ***Cross-Sectional Studies***

Stensland, Gaumer, and Miller (2010) published the most recent cost shift study. In it, the authors describe two hypotheses to explain descriptive evidence that is frequently considered the signature of cost shifting. One hypothesis, promoted by the hospital and insurance industries or consulting firms on their behalf (PWC 2009, Fox and Pickering 2008; see also Dobson et al. 2009), is that costs are not influenced by Medicare payments (i.e. are exogenous) and lower Medicare payment-to-cost margins induce hospitals to seek higher payment from private sources. The alternative dynamic was described in Section 4.1: hospitals with strong market power and a profitable payer mix have strong financial resources, high costs, and therefore low Medicare margins.

Though these are dynamic cost shifting hypotheses, strictly speaking Stensland, Gaumer, and Miller only test static versions of them. That is, they only examine price discrimination. Pooling across years the authors illustrate how margins correlate across payers and how they relate to costs and market power. Their descriptive findings are based on 2002-2006 Medicare hospital cost reports. Because they stratify their analysis by degree of Medicare margin it is (weakly) cross-sectional. This analysis is supplemented with two case studies of Chicago and Boston area hospitals based on 2005 IRS filings and newspaper accounts to characterize qualitative differences in market power across hospitals. They find that hospitals with lower non-Medicare margins had higher Medicare margins. In turn, hospitals with higher Medicare margins had lower costs. Finally, hospitals with higher market power had higher costs, lower Medicare margins, and higher private-pay margins. However, the descriptive analysis does not support causal inference. Thus, they do not find evidence of cost shifting. Indeed, they never test for it (though, to be fair, neither do the industry-funded studies the authors aim to refute).

<b>Table 2. Empirical Cost Shift Literature (1996 to Present)*</b>					
Citation	Principal Data Source	Unit of Obs. and Methods	Dependent Variable(s)	Independent Variables	Cost Shifting Results
Gowrisankaran and Town 1997	1991 CPS, HCFA and AHA data.	Estimated a dynamic, structural model of the market for inpatient hospital services. Simulated welfare effects of 1984 change to Medicare hospital prospective payment system.	The model included the effects of entry, exit, investment, and multi-payer pricing decisions.	Observable parameters include proportion of patients ill by payer, income threshold for free care, copayment, Medicare deductible, Medicare reimbursement rate, corporate tax rates, and discount rate.	Due to more concentrated hospital markets, private payers experienced a 10% reduction in quality and a 1% decline in price.
<i>Cross-Sectional Studies</i>					
Stensland, Gaumer, and Miller 2010	2002-2006 Medicare hospital cost reports and 2005 IRS filings.	Hospital-year level descriptive analysis.	Medicare margins.	Non-Medicare margins.	Hospitals with lower non-Medicare margins had higher Medicare margins. In turn hospitals with higher Medicare margins had lower costs. Hospitals with higher market power had higher costs, lower Medicare margins, and higher private-pay margins. Illuminates factors relevant to price discrimination.
Dobson, DaVanzo, and Sen 2006	2000 American Hospital Association annual survey data.	State-level OLS.	Private payers payment-to-cost ratio.	Medicare, Medicaid, and uncompensated care payment-to-cost ratio and HMO penetration.	Found statistically significant evidence of price discrimination. HMO penetration and private payment-to-cost ratio negatively correlated.
<i>Fixed-Effects Studies</i>					
Zwanziger, Melnick, and Bamezai 2000	1983–1991 California Office of Statewide Health Planning and Development hospital discharge data.	Hospital-year OLS including hospital fixed effects and instrumental variables for costs.	Per patient private payment.	Per patient revenue for Medicare and Medicaid, measures of hospital competition, ownership status, average cost (instrumented), case mix, and hospital fixed effects.	Private prices increased in response to reductions in Medicare rates (elasticities from 0.58 to 0.17, depending on hospital market concentration); they had a small and generally insignificant response to changes in Medicaid reimbursement. Inclusion of separate markups for Medicare and Medicaid across multiple years complicates interpretation of a dynamic cost shift rate.
Zwanziger and Bamezei 2006	1993-2001 California Office of Statewide Health Planning and Development hospital discharge data.	Hospital-year level OLS with hospital fixed effects and instrumental variables for cost.	Per patient private revenue.	Per patient Medicare and Medicaid revenue, average costs, level of hospital market competition (HHI), HHI-year interactions.	A 1% decrease in Medicare (Medicaid) prices caused a 0.17% (0.04%) private price increase. Over the 1997-2001 period, 12.3% of the total increase in private prices was caused by public payment decreases.

<i>Difference Model Studies</i>					
Clement 1997/1998	1982-1983, 1985-1986, 1988-1989, 1991-1992 California Office of Statewide Health Planning and Development hospital discharge data.	Hospital-level OLS.	Change in logarithm of private revenue-cost margins.	Change in Medicare and Medicaid margins, total margin, other revenue, assets, hospital competition, HMO market strength, private occupancy rate, service mix, profit and ownership status, and other measures of case mix and hospital characteristics.	Negative correlations between public and private margins. Inclusion of separate margins for Medicare and Medicaid across multiple years complicates interpretation of a cost shift rate. HMO market strength is negative correlated with private prices.
Dranove and White 1998	1983, 1992 California Office of Statewide Health Planning and Development hospital discharge data.	Hospital-level OLS, SUR, and logit (for closings).	Changes in (1) private price/cost margin, (2) service levels, and (3) closings.	Public payer case load, hospital competition, hospital size, a high-tech hospital indicator, profit status, and drivers of demand.	Find no evidence of cost shifting. Service levels fell at Medicaid-dependent hospitals and such hospitals were more likely to go out of business. Service level per admission positively correlated with hospital market concentration.
Friesner and Rosenman 2002	1995, 1998 California Office of Statewide Health Planning and Development hospital discharge data.	Hospital-level OLS.	Change in (1) private prices and (2) public and private service intensity (length of stay)	Changes in Medicare or Medicaid charges and proportion unpaid, changes in number of beds, race, ethnicity, outpatient prices, and income.	Non-profits cost shift and for-profits do not. Both types lower service intensity for public payers.
Cutler 1998	1985-1995 data from Medicare cost reports and Interstudy.	Hospital-level OLS and logit (for closure and technology models).	(1) Changes in per patient non-Medicare (includes Medicaid) private revenue, (2) hospital closure, (3) logarithm of number of hospital beds, (4) change in logarithm of FTE of nurses, (5) indicators of acquisition of particular technologies.	Per patient “Medicare bite”—growth difference between hospital market basket and Medicare payments—changes in cost, managed care enrollment, for profit and ownership status, number of beds, and MSA size.	1985-1990: at least a dollar-for-dollar cost shift, no evidence of an effect on hospital closure; 1990-1995: no evidence of cost shifting, a small effect indicating increased closures. In both periods, nursing input was reduced. Little evidence that payment changes affected hospital size or diffusion of technology. Rise in managed care explains differences over two time periods.
Wu 2009	1996, 2000 Medicare hospital cost reports.	Hospital level OLS with hospital fixed effects and instrumental variables for Medicare price and HMO market penetration.	Change in non-Medicare price.	Change in Medicare price and revenue (instrumented), private/public payer mix, hospital ownership type, level and change in HMO market penetration (instrumented), change in case mix, hospital occupancy rate, level and change in Medicaid-to-Medicare physician fee ratio, share of for profit hospitals, and hospital market concentration.	On average, about 20% of Medicare payment reductions are shifted to private payers. Degree of cost shifting is lower for hospitals in more competitive markets or markets with a higher share of for profit hospitals.

\* Excludes any literature reviewed in Morrisey (1996).

Dobson, DaVanzo, and Sen (2006) employ a cross-sectional analysis of static public and private margins. Thus, it is more appropriate for the study of price discrimination than cost shifting. Using American Hospital Association survey data, they exploit year 2000 state variation in payment-to-cost margins for private payers, relating them to variations in Medicare, Medicaid, and uncompensated care margins, controlling for HMO penetration rates. Though they find statistically significant evidence of price discrimination, their analysis doesn't control for costs. Since costs are in denominator of the dependent and independent margin variables, the results confound price with cost effects, another reason why they do not provide evidence of cost shifting.

### ***Fixed Effects Specifications***

Due to the rich set of hospital payment and discharge data available from the California Office of Statewide Health Planning and Development (OSHPD), many cost shifting studies focus on the California market, spanning different methodologies and time periods. I review them in succession, beginning with Zwanziger, Melnick, and Bamezai (2000), which considers the California market over the 1983-1991 period. Just prior to this study window (1982) California enacted legislation that permitted establishment of selective contracting insurance products. By the end of the study period (1990), over 80% of the privately insured in California were enrolled in such a plan. Thus, the period of study represents one of increasing price competition for hospitals due to the growing collective market share of network-based plans. Additionally, during the 1980s Medicare and Medicaid reimbursements to California hospitals fell relative to costs (Dranove and White 1998).

Zwanziger, Melnick, and Bamezai (2000) estimate a hospital-year level ordinary least squares (OLS) model of per patient private payment with hospital and year fixed effects (meaning the model controls for overall payment level for each hospital separately, as well as yearly payment changes that affect all hospitals equally). Independent variables include per patient Medicare and Medicaid revenue, measures of hospital competition, ownership status, average cost, and case mix. Costs and private payment levels are simultaneously determined because both are affected by quality (formally, costs are endogenous). To untangle the simultaneity and obtain unbiased estimates, costs are modeled with an instrumental variables (IV) technique.<sup>3</sup> A large number of interactions are used to allow for heterogeneity of public price variables by level of hospital competition, profit status, and time period (1983-

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<sup>3</sup> Instrumental variables are observable factors that do not directly affect the dependent variable (in this case private payment) but do affect the endogenous variable (in this case costs), precisely in the way assignment in randomized trial affects treatment but does not directly affect outcome (Pizer 2009).

1985, 1986-1988, 1989-1991). The study window was broken into three equal size periods to test the hypothesis that cost shifting would be less feasible as managed care plans captured more of the market in later years.

The results indicate that hospitals—both for- and non-profit—shifted costs in response to reductions in Medicare rates. The percent increase in private payment in response to a 1% decrease in Medicare revenue varied across time period and hospital market concentration from a low of 0.17% to a high of 0.59%. Non-profit hospitals in less competitive markets tended to have lower rates of cost shifting than those in more competitive markets. Responses to Medicaid cuts were an order of magnitude smaller and generally statistically insignificant. The results are consistent over time, despite the increasingly competitive nature of the market. This result is puzzling and not consistent with the findings of other studies, reviewed below. One possible explanation is that the instruments for cost (each hospital's cost relative to average hospital costs computed over the state and over the hospital's market) may be correlated with the dependent variable (private payment), which violates an assumption of the IV technique.

Zwanziger and Bamezei (2006) is a follow-up study in which the authors implement a similar fixed-effects specification, focusing on the same dependent and key independent public payment variables and from the same data source. The principal difference is that the study window is later than that considered in Zwanziger, Melnick, and Bamezai (2000): 1993-2001. Also, a slightly different set of controls are applied: average costs (instrumented, as described above), level of hospital competition (the Herfindahl-Hirschman index, HHI<sup>4</sup>), and HHI-year interactions. The justification for returning to the cost shifting question with a very similar model and the same data source but at a later time is twofold: (1) California hospital price competition increased over the 1990s; and (2) the Balanced Budget Act (BBA) of 1997 reduced the growth rate of Medicare hospital reimbursements. That the study window straddles 1997 BBA enactment is a particular strength, especially if one believes that its Medicare payment change provisions are a source of exogenous variation in Medicare prices.

The results of Zwanziger and Bamezei (2006) are similar to those of their earlier study. They find no statistically significant difference in cost shifting relationships between for- and non-profit hospitals, no difference before and after the BBA, and no evidence of an influence of hospital competition intensity. Their main finding is that a 1% decrease in Medicare (Medicaid) prices caused a 0.17% (0.04%) private price increase. Put another way, over the 1997-2001 period, 12.3% of the total increase in private prices was caused by public payment decreases.

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<sup>4</sup> The HHI is the sum of squares of market shares.

## *Difference Models*

Clement (1997/1998) examines the relationship between private revenue-cost margins and Medicare and Medicaid margins in California during three fiscal years (1985-1986, 1988-1989, 1991-1992) relative to a baseline year (1982-1983). Using OSHPD hospital discharge data, she estimates a hospital-level OLS with dependent variable change in log of private revenue-to-cost margin. Changes in Medicare and Medicaid payment-to-cost ratios (margins) are entered linearly and squared (not logarithmically), interacted with year dummies. Control variables include the hospital's total margin, a measure of other revenue, an historical average of asset value, hospital competition, HMO market strength, private occupancy rate, service mix, profit and ownership status, and other measures of case mix and hospital characteristics. Clement finds negative correlations between public and private margins, potentially evidence of cost shifting. However, because the model is of margins and not payment, one cannot separately identify effects of payment and costs. Additionally, the inclusion of separate margins for Medicare and Medicaid across multiple years complicates calculation of a cost shift rate.

Dranove and White (1998) also examine changes in private price-cost margins, as well as in service levels and hospital closings, in the California hospital market during the 1980s and early 1990s. Their approach is based on the notion that if hospitals can shift costs, they will do so at a greater rate if their public pay case load is larger.<sup>5</sup> In addition, hospitals with larger public case loads may reduce quality to a greater extent than those with smaller public case loads as public reimbursements decline. Dranove and White proxy quality with service intensity (number of services per day, controlling for DRG). Using 1983 and 1992 California OSHPD hospital discharge data, they estimate hospital-level OLS, seemingly unrelated regression (SUR), and logit (for closings) models of the effect of Medicare and Medicaid case loads (proportions of billed charges) on changes in private margins, service levels to Medicare, Medicaid, or private patients (three different equations), and hospital closings, controlling for hospital competition, hospital size, a high-tech hospital indicator,<sup>6</sup> profit status, and drivers of demand. They test different specifications with the independent variables entered as levels, changes, or both.

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<sup>5</sup> On the other hand, one could argue that hospitals with lower private case load have less leverage to shift costs (Wu 2009).

<sup>6</sup> About the high-tech indicator the authors write that it "equals 1 if the hospital is in roughly the top one-quarter to one-third of all hospitals in the state in the breadth of high-tech service offerings, including neonatology, open heart surgery, cardiac catheterization, trauma center, magnetic resonance imaging, and radiation therapy."

The authors find no evidence of cost shifting. Private margins decreased in hospitals with larger Medicare or Medicaid caseloads. However, because margin, not price, is the dependent variable, one cannot say whether prices fell or costs increased. Intensity of services provided for all payer types are negatively associated with Medicare and Medicaid case load sizes, though the results are not statistically significant for private payers. Dranove and White interpret this negative intensity-caseload cross-payer correlation as support for the hypothesis that quality (as proxied by intensity) is a public good. Finally, they find evidence that Medicaid-dependent hospitals are more likely to go out of business. Taken together, the results indicate that the burden of public payer reductions is borne by public patients. Hospitals with higher public payer case loads reduced quality and were more likely to close.

Friesner and Rosenman (2002) is the final study based on California OSHPD hospital discharge data (from 1995 and 1998). The authors make a distinction between charges and payments. The former is what is billed and the latter is what the hospital actually receives. Their models include measures of charges and the proportion of them that are unpaid (i.e. 1-payments/charges). With hospital-level OLS models, the authors estimate the effects of changes in Medicare or Medicaid charges and the proportion unpaid on changes in private prices and public and private service intensity (length of stay), controlling for changes in number of beds, race, ethnicity, outpatient prices, and income. They estimate three models separately by profit status, on private price changes, and on public and private service intensity changes.

For the private price model, Friesner and Rosenman find a statistically significant and positive coefficient on the change in proportion of unpaid public charges for non-profit hospitals but no statistically significant coefficient for for-profit hospitals. They interpret this result as evidence that the former cost shift and the latter do not. However, they also find that the change in public charges is positively correlated with changes in private charges, which is not what hospitals actually receive in payment. For these reasons, their conclusion of non-profit cost shifting is not supported by their model. That a decrease in the proportion of public charges unpaid is associated with an increase in private charges (not all of which is received in payment) is not evidence that lower public payment leads to higher private payment.

Cutler (1998) asks, to what extent do lower Medicare payments lead to lower costs (reduced services and lower quality) and to what extent is the cost level maintained and the burden of covering them shifted to the private sector? His answer depends in part on the nature of the private market, which varied considerably over the two time

periods he examined—1985-1990 and 1990-1995. The time periods of study overlap a series of Medicare hospital payment reductions, including those established by the Consolidated Omnibus Budget Reconciliation Act of 1985, Omnibus Budget Reconciliation Acts of 1987, 1989, 1990 and 1993, and the Balanced Budget act of 1997. For the key independent variable, Cutler constructs a measure of Medicare payment reduction he calls the “Medicare bite.” He notes that Medicare’s hospital prospective payment system had been designed to increase with the costs of medical inputs. However, reductions of the update factors drove a wedge between the originally designed increases and actual ones. The Medicare bite is the difference between the growth of the hospital market basket and the actual growth of Medicare payments multiplied by the number of Medicare patients served by the hospital.

Using data from Medicare cost reports and Interstudy, Cutler estimates by OLS the effect of the Medicare bite on hospital’s changes in per patient non-Medicare private revenue, hospital closures, number of hospital beds, changes in nurse staffing levels, and diffusion of technology, controlling for changes in cost, managed care enrollment, profit and ownership status, number of beds, and MSA size, but, notably, not hospital market structure. He finds that over the 1980-1985 period hospitals shifted costs dollar-for-dollar, a much greater cost shift rate than found by Clement (1997/1998) and Zwanziger, Melnick, and Bamezai (2000) who studied the same time period (though those two studies focus on California only, as described above.) Over 1990-1995 Cutler finds no evidence of cost shifting. Also, in the earlier period there was no evidence of an effect of reduced Medicare payment on hospital closure while in the later period a small effect indicating increased closures was detected. In both periods, nursing input was reduced as Medicare payments declined. There was little evidence that payment changes affected hospital size or diffusion of technology. Cutler’s interpretation is unambiguous. In the late 1980s, Medicare payment cuts were financed by shifting costs to the private sector. With the rise of managed care in the early 1990s, cost shifting was no longer feasible and cost cutting was the dominant response to lower Medicare payments. In particular, nursing staff levels were reduced.

Wu (2009) has provided what is, perhaps, the most careful study of the cost shifting hypothesis. With a long difference model using 1996 and 2000 Medicare hospital cost report data, she examines the effect on private prices of reductions in Medicare payments to hospitals as a result of the Balanced Budget Act of 1997. Moreover, she considers the heterogeneity of that effect across private-public payer mix (a test of the “market” vs. “strategy” hypotheses, discussed in Section 4.1), levels of hospital competition and share of hospitals in the market with for-

profit status. Of all studies reviewed, Wu's provides the strongest mitigation against and test of the potential endogeneity of Medicare payment (that Medicare and private prices are both driven by unobserved factors), thereby providing the most plausible estimate of its causal effect.

Wu constructs two instruments for changes in Medicare revenue: a "BBA bite" (similar to Cutler's (1998) "Medicare bite") and 1996 ratio of Medicare to non-Medicare discharges. The first of these, but not the second, is also used as an instrument for change in Medicare price.<sup>7</sup> The dependent variable is the change in per patient non-Medicare price, again similar to that of Cutler (1998). Two types of models are estimated, one with instrumented Medicare price changes as the key independent variable and another with instrumented Medicare revenue changes as the key independent variable. Other independent variables include a bargaining power measure (the share of discharges that are private pay less than for Medicare patients),<sup>8</sup> hospital ownership type, level and change in HMO market penetration (also instrumented), change in case mix, hospital occupancy rate, level and change in Medicaid-to-Medicare physician fee ratio, share of for-profit hospitals, and hospital market concentration.

Wu estimates a variety of OLS models with hospital fixed effects. In some models, the key independent Medicare price or revenue change variables are interacted with the bargaining power variable (to test the market power versus strategy hypotheses). In other models, the Medicare revenue change is further interacted with hospital characteristics (profit status, teaching hospital indicator, public hospital indicator, HMO market penetration level and change, level and change in proportion of discharges in the market represented by for-profit hospitals). She finds that, on average hospitals shifted 21 cents of each Medicare dollar lost to private payers. The degree of cost shifting varies by hospital bargaining power: a one standard deviation increase in such power increases the cost shifting rate to 33 cents on the dollar. There is no statistically significant evidence of heterogeneity in cost shifting by for-profit, teaching, or public hospital status. Nor does it vary by HMO market penetration or change of it. A smaller degree of cost shifting occurs in markets with a higher share of discharges from for-profit hospitals.

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<sup>7</sup> In analysis not provided in the paper, Wu obtained very different results using un-instrumented changes in Medicare revenue and price, thereby justifying the need for instruments (Wu 2010).

<sup>8</sup> This variable is closely related to one of the instruments used for Medicare revenue so one might think it ought to be excluded as an independent variable in the second stage model. However, Wu conducts a falsification test, finding that the instrumented variables are not statistically significant in the same second stage models using data from a prior period (1992 to 1996).

## 6.0 Discussion

From the analysis of all cost-shifting literature since 1996 provided in the foregoing sections, a number of important qualitative conclusions can be drawn. First, if the time series of hospital margins by payer shown in Figure 1 is the signature of cost shifting, one would expect that careful studies of the phenomenon would find consistent, strong evidence of it. In fact, as a whole, the evidence does not support the notion that cost shifting is both large and pervasive. Instead, they reveal that cost shifting can occur, but may not always do so. When it has occurred, it has generally been measured at a rate far below dollar-for-dollar (the sole exception being Cutler's (1998) measurement of dollar-for-dollar cost shifting over the years 1985-1990).

Taken together, these results strongly suggest that interpretations of the descriptive data of Figure 1 that go beyond an assumption of cost shifting are warranted. That is, cost shifting is just one of many possible responses to shortfalls in public payments to hospitals (another would be cost cutting). Moreover, private payment-to-cost margins change for many reasons other than cost shifting (another would be changes in the hospital-health plan balance of market power). Indeed, the theoretical literature on the subject shows that cost shifting can only occur if hospitals both possess market power and have not fully exploited it. This both limits the conditions under which cost shifting is possible and its extent. Once market power is fully exploited, as it would be by a profit-maximizing firm, there is no further scope for cost shifting. The theoretical literature also reveals the potential endogeneity of public prices in models of private ones, and the role of costs and hospital and plan market power.

Given these findings, what can be said about the likelihood of cost shifting in the future? Relative to the period in which cost shifting is most likely to have occurred at a relatively high rate (when indemnity plans were the norm, 1987-1992), plans now possess a greater ability to resist price increases due to network-based contracting. On the other hand, relative to the period in which there was likely no cost shifting (when tightly managed care dominated, the mid-1990s), price competition is weaker because consumers are less accepting of networks with the same level of restrictions as existed then. To the extent that hospitals still possess some unexploited market power, perhaps some cost shifting is possible, but, given the results reviewed in this paper, it is likely to be at a rate closer to 20 cents on the dollar than the dollar-for-dollar one suggested by industry-funded reports (PWC 2009) and by Cutler's (1998) estimate using data from the 1985-1990 period.

The finding by Wu (2009), Cutler (1998) and others that hospital and plan market power are relevant to cost shifting is not controversial. A large body of work relates plan market concentration (Morrisey 2001; Robinson 2004; Wholey, Feldman, and Christianson 1995; Dafny 2009) and hospital market concentration (Vogt and Town 2006; Robinson and Luft 1988; Berenson, Ginsburg, and Kemper 2010; Robinson 2004; Capps, Dranove, and Satterthwaite 2003; Bamezai et al. 1999) to premiums and health care prices (Frakt 2010). Therefore, cost shifting is not the only, and may not even be the most important, factor in the dynamics of private hospital prices.

Exploitation of market power is the privilege of private industry, subject to antitrust regulation. A market-based health system cannot be immune from it. Plan-hospital market power relations may shift again due to the new health reform law. The PPACA calls for pilots of the accountable care organization (ACO) payment model, which will compensate integrated groups of providers on a capitated basis for all the care for a population (Gold 2010). In doing so, it encourages providers to integrate, potentially increasing their market power (Reinhardt 2010, Frakt 2010). If plan market power holds constant or is weakened, it is likely private prices will increase, even in the absence of changes to public payments.

However, the PPACA also includes provisions to expand public coverage via Medicaid and to reduce Medicare hospital payments relative to cost. Medicaid reimburses hospitals at rates far below that of private plans. Thus, if the crowd out of private coverage encouraged by Medicaid expansion dominates the extent to which it eliminates what would otherwise be uncompensated care, it would create a cost shifting incentive (Pizer, Frakt, and Iezzoni 2010). Furthermore, the law calls for reductions in annual updates in payments for hospital services, payments based on quality performance, and lower payments for preventable hospital readmissions and hospital-acquired infections, among others (Kaiser Family Foundation 2010, Davis et al 2010).

If these changes cause public payments to fall further behind hospital costs as private payments also go up, this will resemble cost shifting. However, judging from the literature on the subject reviewed above, it is unlikely that all or even most of the increase in private payments could be attributed to shortfalls in public ones. Cost shifting would only be part of the explanation. Simultaneous changes in market power will likely explain the rest.

As provisions of the PPACA, such as those described above, approach implementation (and after) it is likely that policymakers will consider further adjustments, perhaps encouraged by some of the stakeholders they will affect: health care providers, insurers, and self-insured firms. In the ongoing debate, claims of large levels of cost

shifting are sure to be made, as they have been in the past. Based on the analysis presented in this paper, policymakers should view such claims with skepticism, particularly if they are based on descriptive, industry-wide evidence, the weakest type from which to draw cost shifting inferences (Morrisey 1996).<sup>9</sup> All told, cost shifting probably plays a much larger role in the debate over health policy than is warranted given its likely size and impact.

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<sup>9</sup> Another consideration that justifies a focus on effects of lower public payment other than cost shifting is that the welfare loss due to cost shifting, if it occurs, is likely very small, as estimated by Santerre (2005).

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