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ARTICLES

CROSS-SUBSIDIZATION IN HOSPITAL CARE: SOME LESSONS FROM THE LAW AND ECONOMICS OF REGULATION

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INTRODUCTION

THERE IS MOVEMENT TOWARD more reliance on competition and less on regulation in the health care sector. This parallels movements in other parts of the United States economy, as well as other parts of the world.[1]

Yet, in the face of this competition, in many of these industries, there exists a desire to maintain "socially desirable" services. In many cases, government policy has promoted cross-subsidization of these services with surplus revenues from more profitable services. Frequently, however, as competition creeps in,

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[1] *See, e.g.*, PAUL J. FELDSTEIN, HEALTH CARE ECONOMICS 300 (4th ed. 1993) (describing how the delivery of medical services in the 1980s moved toward increased market competition rather than regulation); Theodore E. Keeler & Stephen E. Foreman, *Regulation and Deregulation, in* 3 THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 213 (Peter Newman ed., 1998) (outlining the nature of several industries which have been subjected to regulation and deregulation, and noting the recent increase of competition in hospital care).

regulations and other policies have been insufficient to stem the erosion of these surplus revenues. In addition, regulatory policies which endeavor to achieve cross-subsidization of "desirable" services impose inefficiencies and welfare losses of their own. It is for these reasons that in the United States and elsewhere, government policies toward transport and telecommunications have recently moved away from regulating such cross-subsidization.

In the health care sector, on the other hand, even in the face of movement toward increased competition, various social policies – we call them regulations – exist to promote and even enforce the cross-subsidization of "desirable" services. Hospital care is one such category of services. We believe there are not only problems with these policies, but that analogies exist between the hospital sector and other industries where regulation, cross-subsidization, and deregulation have occurred. It is the aim of this Article to set forth these analogies, as well as elucidate the lessons to be learned for the hospital sector.

Many health lawyers and economists believe that "health care is different" from other industries in which cross-subsidization is a social policy, to the extent that lessons from elsewhere are inapplicable. Others believe that, if there is a similarity between health care and other industries, the degree of cross-subsidization is so small in U.S. hospital care, the lessons to be learned are at best limited. The recent papers by Mark Krause[2] and by John Colombo and Mark Hall[3] are not consistent with this view, however. They are much more consistent with the arguments advanced in this Article, and their consistency will be explained later. It is, thus, an important part of this Article to present evidence that: (1) regulation indeed really exists in hospital care, endeavoring to enforce cross-subsidization – just as in railroads or airlines before 1978-80, and (2) the amount of cross-subsidization that these social policies attempt to enforce is not small; indeed, it is demonstrably just as large in magnitude as the cross-subsidization required of U.S. railroads (to support money-losing passenger service) prior to Amtrak in 1970.

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[2] Mark Krause, Comment, *First Do No Harm: An Analysis of the Nonprofit Hospital Sale Act*, 45 UCLA L. REV. 503 (1997) (discussing whether non-profit hospitals should be regulated under the Nonprofit Hospital Sale Acts, and suggesting that the litigation regime the Acts replaced is superior).

[3] John D. Colombo & Mark A. Hall, *The Future of Tax-Exemption for Nonprofit Hospitals and Other Health Care Providers*, 2 HEALTH MATRIX 1 (1992) (assessing the potential impact of proposed federal legislation on tax exemption of nonprofit hospitals and other health care providers).

The first section of this Article presents an analysis of the origins of regulation in the British-American legal systems, its early evolution in the United States, and its relationship to more recently developed theories of regulatory behavior. The second section presents a summary of regulations that encourage and enforce cross-subsidization in U.S. hospital care, and their legal basis. The third section discusses the evolution and ultimate failure of regulation in inter-city passenger and freight transportation industries in the United States. The fourth and fifth sections are concerned with direct comparisons between transportation and hospital care. Two questions are of concern: (1) what is the size of the cross-subsidy to indigent patients in hospitals (we base our estimates on California hospital data); and (2) is the constraint to cross-subsidize hospital care as legally binding as it was in transportation (and to some degree, still is in telecommunications)? In addition, we investigate, in some detail, the extent to which the legal constraint to cross-subsidize in hospital care is as strong as that which occurred in transportation and telecommunications prior to 1980. The sixth section discusses the mechanism by which firm rivalry erodes the surplus revenues used to cross-subsidize "socially desirable" services. Finally, we summarize the lessons to be learned for the hospital sector, based upon experience from other industries in which public policy has attempted to combine regulation and competition.

I. ORIGINS, PRINCIPLES, AND THEORIES OF REGULATION

Regulation, as found in transportation and utilities, dates to the medieval period in England.[4] The sovereign granted monopoly privileges to carriers of goods and people in return for important benefits to the state and public. These benefits included (1) equal access for all at "reasonable" rates; (2) a guarantee of service (carriers could not discontinue service arbitrarily); and (3) strict assumption of liability by carriers for loss and damage to freight and injury to passengers.[5] The charter that gave carriers monopoly rights on routes, in return for providing these services, bestowed a

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[4] *See* THEODORE E. KEELER, RAILROADS, FREIGHT, AND PUBLIC POLICY 19 (1983). For a more extensive discussion of the common law background of regulation in the transportation industry, see also Keeler & Foreman, *supra* note 1, at 215-17.

[5] Except for "natural" tragedy such as weather-related loss and "criminal" activity like highway robbery.

"certificate of public convenience and necessity." Those who followed the carrier rules became "common carriers."

The U.S. laws relating to transportation and utilities used the British common law of "common carriage" as their basis. The first U.S. transportation laws were related to horse-drawn services. With the development of canals and railroads, state and local governments gave these carriers similar certificates of public convenience and necessity. Initially, courts enforced the law of common carriage through case law. As regulation intensified in the late 19th century, federal, state, and local governments codified the law of common carriage and established regulatory agencies.[6]

As electricity, telecommunications, highway, and air transportation came into existence, public regulation was extended to them based on similar principles. Regulatory schemes required new entrants to have certificates of public convenience and necessity. Special agencies regulated rates and the volume of service.

A. The Economic Theory of Regulation[7]

Traditionally, most economists believed that regulation had as its goals "public interest" objectives: efficient allocation of resources and equitable distribution of income. To the extent that regulators failed to meet these objectives, economic observers cited poor execution. This perspective changed as studies began to conclude that regulation appeared to systematically misallocate resources in the public sector.[8] Olson argued that the collective political process, operating in ways that make "rational" sense, can quite readily fail to achieve economically efficient outcomes.[9] From this, George Stigler[10] developed the "economic theory" of regulation. Richard Posner,[11] Sam Peltzman,[12] Gary Becker,[13]

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[6] For example, state agencies for intrastate transportation and the Federal Interstate Commerce Commission. *See* Keeler & Foreman, *supra* note 1, at 215 (discussing the change from regulation by corporate charter and common law to statutory and agency regulation of transportation).

[7] *See generally* Keeler & Foreman, *supra* note 1, at 213, for a more detailed discussion of these issues, and of their relevance to transportation and healthcare.

[8] *See* JOHN R. MEYER ET AL., THE ECONOMICS OF COMPETITION IN THE TRANSPORTATION INDUSTRIES 3-17 (1959); RICHARD E. CAVES, AIR TRANSPORTATION AND ITS REGULATORS (1962).

[9] MANCUR OLSON, JR., THE LOGIC OF COLLECTIVE ACTION, PUBLIC GOODS AND THE THEORY OF GROUPS (1965).

[10] *See generally* George J. Steigler, *The Economic Theory of Regulation*, 2 BELL J. ECON. & MGMT. SCI. 3 (1971).

[11] Richard A. Posner, *Taxation by Regulation*, 2 BELL J. ECON. & MGMT. SCI. 22 (1971) (explaining the "taxation by regulation" feature of the regulatory process).

Theodore Keeler,[14] and Pablo Spiller[15] extended the theory in various directions. Roger Noll[16] extended, discussed, and summarized the various iterations of the theory.

George Stigler argued that in a representative democracy like the United States, there is a supply of and a demand for regulation established through the political process. Regulation will benefit either producers or consumers (or some combination) depending on the costs and benefits accruing to each. The probability that a group will successfully achieve regulation depends on the group's costs of achieving a coalition – organizing politically – compared to the benefits the group will receive in the form of higher output prices.

Sam Peltzman extended, refined, and formalized Stigler's theory. Each regulator will maximize a political support function in which political support is a function of regulatory benefits to interest groups. Each group (both for producers and consumers) contains different subgroups. The first order condition for the maximization process is that the marginal political support to subsidize a particular user group should equal the marginal political support for other groups. This can result in a decision to cross-subsidize: in particular, charging consumers higher prices to subsidize producers, and charging some consumers higher prices to subsidize other consumers.

Gary Becker and Theodore Keeler establish that there is a link between the economic and public interest theories. Keeler notes that the economic theory of regulation is equivalent to a "many

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[12] Sam Peltzman, *Toward a More General Theory of Regulation*, 19 J.L. & ECON. 211 (1976) (extending George Steigler's theory that regulatory agencies will not exclusively serve a single interest).

[13] Gary S. Becker, *A Theory of Competition Among Pressure Groups for Political Influence*, 98 Q.J. ECON. 371 (1983) (presenting a "theory of the political redistribution of income and of other public policies that builds up on competition among pressure groups for political favors").

[14] Theodore E. Keeler, *Theories of Regulation and the Deregulation Movement*, 44 PUB. CHOICE 103 (1984). (considering three potential alternatives to explain the history of regulation and deregulation of industries by the U.S. government).

[15] Pablo T. Spiller, *Politicians, Interest Groups, and Regulators: A Multiple-Principals Agency Theory of Regulation, or "Let Them Be Bribed,"* 33 J.L. & ECON. 65 (1990) (expanding the self-interest theory of regulation to account for the potential agency problems between Congress and its regulators).

[16] Roger G. Noll, *Economic Perspectives on the Politics of Regulation, in* HANDBOOK OF INDUSTRIAL ORGANIZATION 1254, (Richard Schmalensee & Robert D. Willig eds., 1989) (providing an interpretative survey focusing on research that employs the conceptual model and methods of economics and uses "economic theoretical . . . arguments to make predictions about political behavior . . .").

person Ramsey tax" in which the marginal political support available from each group is the equivalent of a "welfare weight." Satisfaction of the group's interest also satisfies the public interest.[17] Pablo Spiller extends the theory to take account that regulatory agencies are in fact agents of legislatures, who can in fact monitor regulators only imperfectly. Spiller develops a principal-agent theory of regulators based on this fact.

Charles Phelps[18] has applied the Peltzman theory of regulation to hospitals, noting that the boards of trustees of many nonprofit hospitals act like a powerful interest group in a Peltzman-like model, exerting pressure on the hospital to cross-subsidize charity patients. Below, we carry the argument a step further, arguing that the community itself puts pressure on the hospital (its board and its management) in the manner of a Peltzman-style regulator to cross-subsidize, so that even for-profit hospitals (which certainly have an incentive not to cross-subsidize at all) are unable to escape providing charity care.

II. REGULATION IN HOSPITAL CARE

A. Formal regulation in hospital care

Heretofore, with a few notable exceptions (most especially all the articles in a volume by Sloan, Blumstein, and Perrin),[19] the principal economic focus of studies of health care and hospital regulation has concentrated on apparent and direct rule-making. The most obvious is rate regulation. While the federal government has generally refrained from universal rate regulation of health care, several states have actively set rates, at least for hospital services. Economic analysis of these rate setting programs has concentrated on their ability to "control costs" and their subsequent impact on expenditures for the regulated service (e.g., hos-

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[17] An extension of the economic theory of regulation in transportation, in communications, and in medical care suggests the possibility of a "hidden" surrogate theory. Just as protection of the farmers' interests translated into regulation that benefited the railroads, and radio and television stations operated "in the public interest" with substantial economic benefit to license holders, a great deal of regulation that aims to benefit uninsured hospital patients inures to the economic benefit of hospitals. Hospitals may be the largest beneficiaries of cross subsidies.

[18] Charles E. Phelps, *Cross-Subsidies and Charge-Shifting in American Hospitals, in* UNCOMPENSATED HEALTH CARE: RIGHTS AND RESPONSIBILITIES 108, 108-25 (Frank A. Sloan et al. eds., 1986).

[19] *See id.* (presenting papers delivered at a conference focusing on individual rights to healthcare and how services should be allocated).

pital services).[20] These studies have sparked debate over the effectiveness of regulation in controlling costs. They had not, by and large, considered the impact of rate regulation in terms of economic efficiency or in terms of its effect on other segments of the industry.

The federal government's setting of rates for hospital and physician services under the Medicare program provides another obvious and direct form of health care rate regulation. Although technically hospitals and physicians can avoid this regulation by avoiding Medicare patients, the large fraction of physician hospital business accounted for by Medicare patients makes these controls tantamount to regulation, and they have been seen as such by many economists.[21] Approximately thirty-five percent of all U.S. personal health care expenditures, and forty-five percent of hospital expenditures, occur under the Medicare and Medicaid programs.[22] In 1984, Medicare began paying hospitals a standardized, prospectively determined amount, based on the diagnostic related group (DRG) payment system.[23] In 1991, this payment philosophy was expanded to include physician services in the form of a resource-based relative value system (RVRBS).[24] Accordingly, a significant share of American health care payment is currently subject to a

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[20] *See, e.g.,* Craig Coelen & Daniel Sullivan, *An Analysis of the Effects of Prospective Reimbursement Programs on Hospital Expenditures,* HEALTH CARE FINANCING REV., Winter 1981, at 1 (discussing the effect of various voluntary and involuntary state prospective review programs on hospital expenditures); David Dranove & Kenneth Cone, *Do State Rate-Setting Programs Really Lower Hospital Expenses?,* 4 J. HEALTH ECON. 159 (1985) (investigating whether the success of mandatory hospital rate-setting programs are due to regulatory success or to the "regression to the mean"); Frank A. Sloan & Edmund R. Becker, *Internal Organization of Hospitals and Hospital Costs,* INQUIRY 224 (1981) (discussing how organizational factors affect hospital costs, and concluding that hospital expenses are lowered when hospital-based physicians are compensated under incentive contracts); FELDSTEIN, *supra* note 1, at 289-90.

[21] *See, e.g.,* REGULATING DOCTORS' FEES: COMPETITION, BENEFITS, AND CONTROLS UNDER MEDICARE (H.E. Frech III ed., 1991) (analyzing the changes in the way physicians are compensated under Medicare, in terms of economics and health policy).

[22] *See* Katherine R. Levit et al., *National Health Expenditures,* 1994 HEALTH CARE FINANCNING REV., Spring 1996, at 234-35 (demonstrating personal and hospital care expenditures for 1960-94).

[23] *See* FELDSTEIN, *supra* note 1, at 291-93 (providing a recent survey of the evidence of the effects of DRGs on Medicare hospital expenditures).

[24] See REGULATING DOCTORS' FEES, *supra* note 21, for an a priori critique.

form of rate regulation.[25] As with state rate setting, most economic studies of the impact of the federal payment system have concentrated on payments and not on the economic effectiveness of the programs.

Furthermore, the federal government and the states have regulated "quantity" and "quality" in the form of certificate of need (CON) laws and regulations. CON has as its principal thrust the elimination of unnecessary and costly duplication of services by hospitals. Starting with rudimentary (and generally voluntary) hospital planning regulations in the 1960s,[26] nationwide capital expenditure review began with the enactment of the CON law.[27] These strictures, enacted at the federal level, required each state to approve most new capital expenditures and services of hospitals.[28] The underlying rationale was, if all hospitals could not acquire new technology or offer new services, the few who did extend these service would provide them more efficiently. States implemented CON with varying degrees of stringency. A number of studies concluded that CON had not been effective; hence, the Reagan administration repealed the mandate that states have a CON program.[29] However, while several states have abolished health-planning review, a number still retain the program. Few studies have assessed the economic impact of CON or the validity of its underlying rationale.

Finally, most states strictly regulate hospital, physician, and other provider services in the form of state licensing requirements which attempt to regulate quality. In the process, however, they may indirectly impose quantity controls as well. While different states have different levels of licensing requirements, the total effect of a state's licensing programs is pervasive.[30] There has been

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[25] Further, state Medicaid programs and private insurers, particularly Blue Cross & Blue Shield Plans, commonly mimic federal Medicare payment practices, so the pervasiveness of rate regulation is even greater.

[26] *See* Social Security Act, 42 U.S.C. § 1320a-1 (1994) (defining capital expenditures as "expenditure[s] which ... [are] not properly chargeable as an expense of operation and maintenance" and which exceeds a *de minimus* amount, originally set at $20,000).

[27] The National Health Planning and Resources Development Act of 1974, 42 U.S.C. § 1320a-1 (1991).

[28] In excess of a *de minimis* amount, initially set at $200,000. *See id.*

[29] *See* FELDSTEIN, *supra* note 1, at 271-77 (surveying the evidence of the effects of CON regulations on the expansion of the health care system and controlling hospital investment).

[30] For example, the California licensing laws fill several library shelves. *See* CAL. HEALTH & SAFETY CODE §§ 1200-1794.29 (West 1998).

little economic evaluation of the effect of these programs on other sectors of the health economy.

In summary, there is much direct, obvious regulation of health care by most measures. If the experience gained from transportation and utilities is any guide, the pervasiveness of obvious regulation has substantial economic implications. However, there are "hidden" regulations that impose even greater regulatory burdens on the delivery of health care services. These hidden regulations are even less studied.

B. Hidden Regulation In Hospital Care

The universal practice of cross-subsidizing patient services in the U.S. health care system is the predominant mode of hidden regulation in the industry. Historically, cross-subsidies have been a tradition in this sector of the economy.[31] Furthermore, with increasing attention to universal health care access for all Americans, the pressure for increased levels of cross-subsidization will continue to grow.

Currently, the law provides legitimacy for the cross-subsidization of hospital care. Most state level anti-dumping laws, along with the Consolidated Omnibus Budget Reconciliation Act (COBRA),[32] make it illegal for hospitals to deny emergency treatment to patients – irrespective of their ability to pay.[33] On the surface, this sounds ethical and fair. However, consider the effect of a law that requires a grocer to distribute food to those who are unable to pay for it. Yet, that is precisely what the Act requires of hospitals. In order for hospitals to care for nonpaying or under-

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[31] *See generally* ROSEMARY STEVENS, IN SICKNESS AND IN WEALTH (1989) (providing an extensive survey of the roles of, and external influences on, U.S. hospitals during the 20th century). *See also* Uwe Reinhartdt, *Uncompensated Hospital Care, in* UNCOMPENSATED HEALTH CARE: RIGHTS AND RESPONSIBILITIES, *supra* note 18 (providing an excellent historical and philosophical discussion of charity care); Frank A. Sloan et al., *Idenyifying the Issues: A Statistical Profile, in* UNCOMPENSATED HEALTH CARE: RIGHTS AND RESPONSIBILITIES, *supra* note 18, at 16 (providing empirical findings regarding questions surrounding social issues associated with uncompensated hospital care).

[32] 42 U.S.C. § 1395dd (1994) (providing examination and treatment provisions concerning emergency medical conditions for hospitals that have an emergency department).

[33] *See* Erik J. Olson, *No Room at the Inn: A Snapshot of an American Emergency Room*, 46 STAN. L. REV. 449, 480 (1994).

paying patients,[34] they simply overcharge paying patients to cover their uncompensated costs.

The ability and willingness of governments to compel such behavior is much older than COBRA. Students of regulation recognize it readily. Forcing hospitals to treat patients for less than full price constitutes enforced cross-subsidization, a policy historically and commonly pursued in the markets for transportation and utilities. While COBRA codifies hospital cross-subsidization for emergency room services, hospital cross-subsidization was pervasive prior to its adoption.[35] For example, cross-subsidization mandates attach to.hospital incorporation, tax status, accreditation, and even to principles of legal liability. Indeed, most U.S. hospitals were established between 1890 and 1930 as charitable entities (generally staffed by religious orders or operated as government entities). They were primarily located in urban areas, to provide health services to those in need and, either implicitly or explicitly, without regard to ability to pay.[36] Prior to 1935, patients paid for hospital care out-of-pocket. Wealthy patients generally received care from physicians and nurses in the comfort of their homes. Conversely, low-income individuals received their care primarily from charitable hospitals. Hence historically, cross-subsidization has been a cornerstone of the American hospital industry.

In order to incorporate as a charitable organization,[37] a hospital must acquire a "charter" from its state of incorporation. The hospital's charter contains a statement of "charitable purpose," often relating to care of the sick and injured irrespective of ability to pay. Courts have held that the assets of a charitable hospital become impressed with the charitable purpose expressed in its char-

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[34] The number of non-paying patients treated by hospitals is large. From 1990 to 1992, the percentage of uncompensated care patients treated by U.S. hospitals averaged 5.9%. *See* HEALTH INSURANCE ASS'N OF AMERICA, SOURCE BOOK OF HEALTH INSURANCE DATA 1994, at 100 (1995).

[35] Michael Morrisey argues persuasively that cross-subsidization (what health economists call cost shifting) is, in reality, merely price discrimination. However, to the extent that some of the hospital's patients receive care at less than the hospital's marginal cost of treatment (certainly the case for free care), economic distortions will result. *See* MICHAEL A. MORRISEY, COST SHIFTING IN HEALTH CARE: SEPARATING EVIDENCE FROM RHETORIC 46-59 (1994).

[36] *See generally* Peter Temin, *An Economic History of American Hospitals, in* HEALTH CARE IN AMERICA: THE POLITICAL ECONOMY OF HOSPITALS AND HEALTH INSURANCE 75, 78-81 (H.E. Frech, III ed., 1988) (discussing the early development of the modern hospital system).

[37] Most U.S. hospitals are nonprofit corporations.

ter: the "charitable trust" doctrine.[38] Each state enforces the charitable trust doctrine for the intended beneficiaries. In essence, the very charitable nature of the hospital's incorporation establishes a cross-subsidy.

The grant of privileges to the hospital can also establish cross-subsidies (this is highly analogous to regulated railroads and airlines; both land grants and the establishment of monopoly power in return for social services represent such *quid pro quo* regulatory behavior). Most nonprofit hospitals are exempt from payment of local, state, and federal taxes.[39] However, in order to maintain this exemption, there exists a requirement that hospitals provide a certain level of "charitable" or uncompensated care.[40] In this case, the *quid pro quo* for tax exemption is cross-subsidization.

Another example of this phenomenon is the Hill-Burton Act.[41] The Hill-Burton Act provided nonprofit hospitals with construction funds in return for a designated level of charitable care – for a specified period of time. As hospitals reached the limits of their charitable care obligations, the federal government sought ways to extend them.[42] Indeed, government policies towards hospitals saying, in effect, "we gave you Hill-Burton money; now you give us free charity care"[43] very closely paralleled the regulatory attitude that prevailed towards railroads for years: "we gave you land grants and exclusive operating rights; now you give us passenger trains and money-losing branch lines."

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[38] *See* Queen of Angels Hosp. v. Younger, 136 Cal. Rptr. 36, 39 (Cal. Ct. App. 1977) (holding the Attorney General had no authority to prohibit a corporation from operating a clinic pursuant to the corporation's charitable purposes, outlined in the articles of incorporation).

[39] Tax exemption and access to tax-exempt revenue bond financing are the major points of nonprofit incorporation.

[40] *See* Utah County v. Intermountain Health Care, Inc., 709 P.2d 265 (Utah 1995) (listing factors that must be weighed in determining whether a hospital qualifies as a "charity" for tax exemption purposes); Simon v. Eastern Kentucky Welfare Rights Organization, 426 U.S. 26 (1976) (discussing class action brought by organizations representing indigent individuals against the IRS, stating that agency violated Internal Revenue Code and Administrative Procedure Act by allowing nonprofit status to a hospital that limited indigent care to emergency room services).

[41] 42 U.S.C. §§ 291 *et seq.* (1991) (establishing governmental funding to nonprofit hospitals that promote charitable services).

[42] For example, the litigation produced by the Carter administration's attempts to extend the charitable care obligations. *See* American Hospital Ass'n v. Schweiker, 721 F.2d 170 (7th Cir. 1983), *cert. denied,* 466 U.S. 958 (1984).

[43] *See* James F. Blumstein, *Providing Hospital Care to Indigent Patients: Hill-Burton as a Case Study and a Paradigm, in* UNCOMPENSATED HEALTH CARE: RIGHTS AND RESPONSIBILITIES, *supra* note 18 (discussing the obligations of hospitals receiving Hill-Burton funding to provide charity care).

To conclude this section, we note that U. S. hospitals face legal requirements to cross-subsidize that appear very substantial. But, one might ask, "so what?" and "are these subsidies really substantial?" The amount of money involved could be very small and the legal requirements effectively weak, or *vice versa*. We address these issues in the following sections. However, we first consider the effects of mandatory cross-subsidization in transportation and telecommunications. In the subsequent section we estimate the size of the cross-subsidy in hospital care, and the punishments faced by hospitals that fail to adequately cross-subsidize.

III. REGULATION AND CROSS-SUBSIDIZATION IN TRANSPORTATION AND TELECOMMUNICATIONS

Economic theories of regulation explain much about the evolution of U.S. regulatory policy in transportation and utilities. Such regulation: (1) restricted the entry of new firms, (2) caused providers to offer some services above marginal cost, others below cost, and many at different price-cost margins from the levels of a free market, (3) blocked exit from unprofitable services that were considered "socially desirable or necessary," and (4) gave many producers excess rents.

In the simplest of terms, regulation always had as its goal the cross-subsidization of certain services. This was accomplished by providing excess rents to certain factors of production. Crucial components of this strategy were restrictions on entry into profitable services – to maintain the flow of excess rents – as well as restrictions on exit from unprofitable ones.

The economic theory of regulation explains why regulation occurred. What does it say about the reforms of the 1970s and 1980s? Under economic theory, regulation will cease to occur if its costs become too high; in other words, if it fails to contribute a net increase in political support for the elected officials who caused the regulation to occur. Keeler, Noll, and Peltzman have dealt with these issues in some detail.[44] There exist two reasons why these

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[44] Noll and Peltzman deal more broadly with industries than does Keeler, whose analysis deals more with transportation. *Compare* Keeler, *supra* note 14, at 108-15, *with* Sam Peltzman, *The Economic Theory of Regulation after a Decade of Deregulation, in* BROOKINGS PAPERS ON ECONOMIC ACTIVITY 1 (Martin Neil Bailey & Clifford Winston eds., 1989) (evaluating the success of the economic theory of regulation in light of the changes in regulatory institutions); Roger G. Noll, *Comments on Peltzman, in* BROOKINGS PAPERS ON ECONOMIC ACTIVITY 48-58 (arguing that an eco-

costs became too high in the transportation and telecommunica-
tions industries in the 1950s, 1960s, and 1970s. First, it is clear
that many of the technological motivations for regulation (natural
monopoly) that existed in the 1930s no longer existed by the
1970s, or even earlier. Thus, airlines and long-distance telecom-
munications had far higher traffic densities in the late 1970s than
in the 1930s, and they were much further from being natural mo-
nopolies. Believers in the economic theory of regulation might ar-
gue that scale economies are relevant only to the case of public
interest regulators. However, this is disputed by Keeler: a regulator
following the economic theory is nothing other than that of a pub-
lic interest regulator exercising uneven welfare weights and hence,
is as likely to pay attention to scale economies as a public interest
regulator.[45] Second, there is evidence that by the 1970s (indeed, by
the 1950s), regulation was at least to some degree failing to
achieve its purposes. This was occurring without reference to
changes in scale economies.

Inter-city passenger transportation supported at least two
forms of cross-subsidization. First, airlines cross-subsidized
shorter-haul and lower-density traffic with profits from longer-
haul, higher-density traffic. Second, railroads (at least until the
creation of Amtrak in 1971) cross-subsidized money-losing pas-
senger service with profits from freight. "Cream-skimming" com-
petition undermined both forms of cross-subsidization. Although
regulation controlled entry of new airlines and fares, service qual-
ity (frequency and capacity) rivalry tended to dissipate rents in-
tended for cross-subsidies. Truck and barge competition (superior
service quality, even at equivalent regulated rates and with regu-
lated entry in trucking) eliminated the excess rents which railroads
were to use to cross-subsidize passengers. Perhaps the first study
to carefully document many of these failures was John Meyer and
his associates in 1959.[46] Similar problems with airlines were
pointed out shortly thereafter by Richard Caves[47] and Michael Le-
vine.[48]

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nomic theory of the political process needs to be considerably broader than the Chi-
cago theories of regulation).
    [45] See Keeler, supra note 14, at 106.
    [46] MEYER ET AL., supra note 8, at 12-14.
    [47] CAVES, supra note 8.
    [48] See Michael E. Levine, Is Regulation Necessary? California Air Transporta-
tion and National Regulatory Policy, 74 YALE L.J. 1416 (1965) (providing a history
of airline regulation, and comparing that with the airline market in California, the
"only . . . major unrelated market").

The Interstate Commerce Commission (ICC) enforced two main types of cross-subsidization for freight: profitable services were to cross-subsidize unprofitable routes (low-density branch lines) and unprofitable commodities (some agricultural goods, among others). However, competition by trucks and barges eliminated the excess rents. Dissipation of rail rents left firms with inadequate funds to make labor "payoffs" (high wages and "featherbedding" work rules) that built up over the years.

Regulators in telecommunications expected the profits from long-distance services to cross-subsidize local services. This worked for a number of years. However, despite the best efforts of the Federal Communications Commission (FCC) and state agencies, competing long-distance operators offered ever-expanding competition. Here, too, market forces undermined intended cross-subsidization, although, as pointed out by Noll,[49] cross-subsidization still flourished when AT&T agreed to the consent decree. Nonetheless, the overall effect of the consent decree was to eliminate it.

Regulation in transportation and telecommunications not only failed to achieve its goals, but produced inefficient outcomes. In airlines and freight transportation, economists argued that the market forces that undermined cross-subsidization (service quality rivalry among airlines) entailed substantial waste of resources (empty plane seats or empty truck back hauls). Furthermore, services such as long-haul passenger trains and low-density rail branch lines became economically obsolete. Operating them occasioned a resource waste that regulators either tolerated or, urged by political forces, supported.

Over time, the costs attributable to these inefficiencies outweighed the economic and political benefits produced by regulation. As suggested by the economic theory of regulation, these inefficiencies produced much of the impetus for regulatory reform. There exists a substantial literature indicating that, by and large, regulatory reform has greatly enhanced economic efficiency in transportation and telecommunications, largely along lines predicted by economists.[50] There is, however, another important outcome of deregulation in transportation and telecommunications

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[49] *See* Noll, *supra* note 44.

[50] For a survey of the evidence in these areas, see Clifford Winston, *Economic Deregulation: Days of Reckoning for Microeconomists*, 31 J. ECON. LITERATURE 1263 (1993).

that is somewhat less remarked in the literature: direct subsidies often replaced failed cross-subsidization schemes.

These are not the sole reasons for deregulation in transportation and telecommunications, but they are important ones. Moreover, they are highly relevant to the health care sector. In recent years, market forces have undermined health care regulation, and there is a parallel "deregulation" movement occurring in the industry. We will discuss these changes, but first we show that the size and importance of regulation in the hospital sector are of the same order of magnitude as that which prevailed in transportation. In fact, the problems attending this sector of the economy are likely to be the same as those which occurred in transportation.

IV. THE IMPORTANCE OF REGULATION IN HOSPITAL CARE – AMOUNT OF THE CROSS-SUBSIDY

It is crucial that we establish the amount of cross-subsidization in hospital care and its importance.[51] For if the amount is small, though required, or is of a *pro forma* ceremonial nature with no real effects, then our comparison between cross-subsidization in hospital care and that of transportation and telecommunications is in error. These issues are addressed in this section.

A. Measurement of the Cost of Uncompensated Care – Conceptual Issues[52]

It has sometimes been asserted that uncompensated care in hospitals is less expensive than one might think because even though the *average* cost is high, the *marginal* cost is low. For this assertion to make any theoretical sense whatsoever, one of two things must be true: (1) there must be sharply increasing returns to scale in hospitals, which makes *long-run* marginal costs below *long-run* average costs, or (2) there must be excess capacity (which cannot be eliminated anytime soon), which makes *short-run* marginal costs below *short-run* average costs. However, empirical evidence lends no support to the idea that most hospitals, especially in urban areas, operate in an area of long-run increasing

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[51] *See generally* Sloan et al., *supra* note 31 (providing some careful earlier estimates of these costs, and noting that further research is needed).

[52] For a well-presented discussion of these issues, see generally Phelps, *supra* note 18.

returns to scale.[53] Therefore, such arguments must be based on the existence of excess bed capacity in hospitals, and the resultant difference between marginal and average costs – with that capacity fixed.

However, many hospitals have closed; hence capacity is not fixed. Nevertheless, for the sake of argument, we base our estimates of the magnitude of cross-subsidy on both long- and short-run marginal costs – not on some notion of average fully distributed costs. In addition, our estimates of the avoidable costs of indigent (uncompensated) patients are for the state of California, one of the most competitive, free-market hospital environments in the United States.

B. Data and Empirical Analysis

To estimate our short-run cost function, we include a size variable in the equation, a size variable judged to be fixed in the short run. Short-run marginal costs can be estimated by calculating the partial derivative with respect to the relevant output (uncompensated inpatient days). That this is so was established theoretically some time ago.[54] To estimate our long-run cost function, we exclude the size variable, and work from the assumption that hospitals in the sample have optimized bed capacity. Taking the partial derivative of such an estimated functional relationship yields a measure of the long-run resource cost of accommodating an extra, uncompensated patient (or any equivalent output).[55] In the context of hospital cost estimation, these issues have been set forth in greater detail by Ennis, Schoenbaum, and Keeler.[56]

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[53] *See* FELDSTEIN, *supra* note 1, at 224-30 (describing the relationship between hospital size and average cost, as well as the variation of average cost among hospitals).

[54] *See, e.g.,* MEYER ET AL.., *supra* note 8 (analyzing the cost characteristics of various modes of transportation); Theodore E. Keeler, *Railroad Costs, Returns to Scale, and Excess Capacity,* 56 REV. ECON. & STAT. 201 (1974).

[55] *See generally* MEYER ET AL., *supra* note 8; Keeler, *supra* note 54, at 201.

[56] Sean F. Ennis et al., Optimal Prices and Costs for Hospitals with Excess Bed Capacity, Presented to the Nat'l Bureau of Econ. Research Conference on Health Econ. (Oct. 23, 1998) (manuscript on file with author). Further crucial issues in hospital cost estimation relate to costs of staffed versus unstaffed beds. For present purposes, we note that, for reasons set forth by Ennis, et al., the propensity to staff only beds which are expected to be in use on the part of a hospital will result in an underestimate of the marginal cost of accommodating an extra patient, even in the short-run. That is because those hospitals which have higher occupancy rates may not have anticipated those occupancy rates, and hence may not have adequately staffed beds for those higher rates. *Id.* This set of arguments was first set forth for hospitals by Friedman and Pauly. *See* Bernard Friedman & Mark Pauly, *Cost Functions for a*

The sample consisted of a pooled cross-section time series of California acute care hospitals, spanning the period FY1986-FY1990. This resulted in an unbalanced panel of 1,891 non-Kaiser acute care hospitals (Kaiser hospitals are not required to report uncompensated care). The number and type of hospitals for each year are presented in Table 2.[57] Descriptive statistics for the series are presented in Table 1.[58] Regression results are presented in Table 3.[59]

We estimate the marginal cost of an indigent patient according to a quadratic multiproduct cost function, first developed by Friedlaender, Winston, and Wang.[60] This form has several advantages, including the fact that it is not necessary to estimate factor share equations or factor share constraints as is done with the translog. Furthermore, as explained by Friedlaender et al.,[61] unlike the translog function, the present cost function allows total independence among outputs in determining costs, though it does not require it. The cost function estimated is given by Equation (1), below:

(1)

$$COST = \beta_0 + \beta_1 Y_1 + \beta_2 Y_2 + \beta_3 Y_3 + \beta_4 Y_4 + \beta_5 Y_5 + \alpha_1 WAGE + (0.5)\Sigma_i \Sigma_j \beta_{ij} Y_{ij} + \Sigma_i \alpha_{i1} Y_i * WAGE + \alpha_2 WAGE^2 + \sigma_1 BEDS$$

$$+ \Sigma_i \sigma_{i1} Y_i * BEDS + \sigma_{21} BEDS * WAGE + \sigma_{22} BEDS^2 + \varphi_1 ALOS + \Sigma_i \varphi_{i1} Y_i * ALOS + \varphi_{12} ALOS * WAGE + \varphi_{13} ALOS * BEDS$$

$$+ \varphi_{33} ALOS^2 + \theta_1 NON + \theta_2 PUB + \theta_3 DIS + \theta_4 DUMMY + \theta_5 T + \varepsilon$$

The following additional constraints were placed upon our parameter estimates: $\beta_{ij} = \beta_{ji}$. Upon applications of Shepard's lemma, the following factor demand equation was derived from Equation

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Service Firm with Variable Quality and Stochastic Demand: The Case of Hospitals, 63 REV. ECON. & STAT. 620 (1981) (deriving and testing cost functions for firms observed over time when demand is stochastic and unobserved qualitative deterioration in output is possible, and applying this analysis to hospital costs).

[57] *See* Table 2, *infra* page 28.

[58] *See* Table 1, *infra* pp. 26-27. The low wage figures in Table 1 are due to the fact that they average in imputed values for volunteer labor, of which hospitals use a considerable amount. This approach was deemed superior to ignoring volunteer labor.

[59] *See* Table 3, *infra* pp. 29-34.

[60] Ann F. Friedlaender et al., *Costs, Technology, and Productivity in the U.S. Automobile Industry,* 14 BELL J. ECON. 1 (1983) (analyzing the "structure of costs, technology, and productivity in the U.S. automobile industry by estimating a general hedonic joint cost function for domestic automotive production" for major U.S. automobile manufacturers).

[61] *Id.*

(1), where X_j is the total productive hours worked by hospital employees:

(2)

$$X_j = \partial COST/\partial WAGE = \alpha_1 + \Sigma_i \alpha_{i1} Y_i + 2\alpha_2 WAGE + \varphi_{12} ALOS + \varphi_{21} BEDS + \varepsilon$$

where,

COST= total hospital expenditures.

Y_1 = total number of indigent (uncompensated) inpatient days (INDI).

Y_2 = total number of Medicaid inpatient days (MEDCD).

Y_3 = total number of Medicare inpatient days (MEDCR).

Y_4 = total number of private patient inpatient days (PRV).

Y_5 = total number of outpatient visits (OUT).

WAGE = average hospital specific wage rate.

BEDS = total number of beds.

ALOS = average length of patient stay.

NON = dummy variable for nonprofit hospitals.

DIS = dummy variable for district hospitals.

PUB = dummy variable for public hospitals.

DUMMY = dummy variable for hospitals that report zero indigent care.

T   = time trend variable (FY1986 to FY1990)

The factor demand depicted by Equation (2) was simultaneously estimated with Equation (1), given the intercorrelation which exists among the error terms of each. We, therefore, employed Zellner's method of seemingly unrelated regressions.

B. Results – New Estimates of Amounts of Cross-Subsidization

The results of the estimation procedures (with and without the "beds" variable included) are shown in Table 3.[62] All output variables are of the expected signs and highly significant. It is clear that the marginal cost of an inpatient day for an uncompensated patient is at least as high as that for anyone else. This gives doubt to the view that uncompensated care patients are somehow "low-cost" compared with others.

It is worth noting as well that the marginal cost estimates (of all patient types) with and without the "beds" variables vary as expected. The estimated coefficient for an inpatient day is consistently lower with beds included than with that variable excluded.

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[62] *See* Table 3, *infra* pp. 29-34.

That is consistent with our earlier theoretical discussion which suggests that if beds are included in the equation, that should generate an estimate of the short-run marginal cost of a patient, whereas exclusion of beds will generate the long-run marginal cost.

By either measure, uncompensated care patients account for a significant part of hospital revenues. Table 4 indicates the total avoidable costs of accommodating uncompensated care patients, based on simulations for mean values of all the independent variables (i.e., for a hospital of average size, with average wages, etc.) varying only the type of hospital (private nonprofit, private for-profit, and government) and the number of uncompensated care patients accommodated on average by each hospital type. [63] The results indicate that the total avoidable cost of uncompensated care is three to four percent of total costs for nonprofit hospitals, and two to three percent for for-profit hospitals (these numbers are all for the relatively competitive California hospital market). This compares with evidence from other studies (cited below) that uncompensated care patients are anywhere from four to six percent of patients in private hospitals. Below we compare this burden of cross-subsidization, with the classic case of failed regulation in the transportation industry.

C. Comparison of Results with Cross-Subsidization Under Rail Regulation in the 1955-1970 Period

One possible objection to the analogy made here is that, even if the cross-subsidization of indigent patients in hospitals resembles past regulatory policies in transport and telecommunications, the amount of the cross-subsidy in health care is sufficiently small so as to make the analogy meaningless. In this subsection, we present evidence that proves this view to be wrong.

Amtrak was formed when rail passenger deficits (an acknowledged and untenable form of cross-subsidization) became an intolerable burden on U.S. railroads. We will now show that the burden of indigent patients on U.S. hospitals in the late 1990s is in fact greater than the burden that passenger trains were on U.S. railroads in the late 1960s and early 1970s. In 1968, shortly before Amtrak was formed because of these burdensome passenger deficits, the passenger deficit faced by Class I U.S. railroads was estimated to

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[63] *See* Table 4, *infra* page 35.

be between $200 and $490 million, or 1.8 to 4.5% of total rail op-
erating revenues, which were $10.9 billion in that year.[64]

By comparison, the estimate of three to four percent of hos-
pital revenues from indigent care for private, nonprofit hospitals,
or even two to three percent for proprietary hospitals in California
is certainly a meaningfully large number. And both were reached
through very similar techniques as avoidable costs; one of the
authors of this Article was a contributor to the earlier literature on
wasted resources from cross-subsidization in transportation, and he
can testify that the methods used to arrive at these numbers are
quite comparable. If anyone believes that the burden of cross-
subsidization in U.S. hospital care in the late 1990s is small com-
pared with that faced by regulated industries in the United States,
the burden is most certainly on him or her to show it; our evidence
certainly suggests otherwise.

V. IMPORTANCE OF REGULATION IN HOSPITAL CARE – HOW MUCH OF A LEGAL CONSTRAINT IS IT?

We have now established that the amount of uncompensated
care that a typical hospital provides in one of the most unregulated
states in the Union is substantial. This is the case, even by com-
parison with the level of cross-subsidization that occurred in the
heyday of the CAB for airlines – taking account of the assertion by
some that, with excess hospital capacity, the marginal cost of un-
compensated care is low. Nevertheless, some observers might ar-
gue that hospital administrators choose to provide uncompensated
care of their own free wills, and that regulation has little or nothing
to do with its provision. We have argued otherwise above, and in
this section we argue that the constraint is indeed binding.

Much evidence is available for the case of for-profit hospitals.
Unlike nonprofit hospitals, for which managers might derive utility

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[64] The figures on the higher rail passenger deficit figure ($490 million) and total
rail revenues come from INTERSTATE COMMERCE COMM'N, ANNUAL REPORT ON
TRANSPORT STATISTICS IN THE UNITED STATES 56-59 (1969) (reporting railway oper-
ating expenses). The higher rail cost figure is based on "fully distributed," or ac-
counting costs attributed to passenger trains, using what some believe to be arbitrary
accounting techniques. The lower-cost figure of $200 million is for those for services
and facilities solely related to rail passenger service. *Id.* at A-1. How overhead rail
costs should be allocated to passenger service is a topic of long-standing controversy-
-hence the wide range of passenger deficit figures. For a discussion of these issues,
see generally MEYER ET AL., *supra* note 8, at 145-67 (discussing the rational alloca-
tion of transportation resources); Theodore E. Keeler, *The Economics of Passenger
Trains*, 44 J. BUS. 148 (1971).

from providing uncompensated care, for-profit managers have lit-
tle incentive to give away shareholders' money – unless they are
required to do so. If private, for-profit hospitals feel compelled to
provide uncompensated care, then it follows that if nonprofit hos-
pitals chose not to provide uncompensated care, they would be pe-
nalized in a similar way. By arguing along these lines, we also
avoid the potential criticism that, because nonprofit hospitals are
charitable organizations, it is only their tax exemption that makes
our society force the provision of·uncompensated care.

As Banks, Wendel, and Paterson[65] have argued, *for-profit
hospitals treat uncompensated care as a cost of doing business.* If
they are to do business, they must provide uncompensated care.
What could be a clearer definition of a *de facto*, but perhaps hid-
den, regulation? To analyze the extent to which uncompensated
care is indeed a cost of doing business, we intend to consider two
different sources of evidence: Bradford Gray's book on for-profit
health care,[66] and considerable empirical evidence on the extent to
which for-profit hospitals provide uncompensated care.

Gray provides institutional evidence that for-profit hospitals
suffer tangible penalties from communities if they under-produce
uncompensated care relative to community expectations.[67] Hence,
his evidence suggests that for-profit hospitals supply uncompen-
sated care as a means of avoiding the penalty that results from
their failure to meet the community's expectation of a reasonable
amount. As a result, Gray argues that for-profit hospitals view the
provision of uncompensated care as a routine cost of doing busi-
ness.[68]

Edward Norton and Douglas Staiger, in an important study in
the *Rand Journal of Economics*,[69] using a data set generated during
the early 1980s (even before COBRA legislation), find that, *rela-
tive to the number of indigent patients in a community*, for-profit
hospitals provide *just as much* uncompensated care as nonprofit
hospitals. The only difference is that for-profit hospitals try to lo-
cate in communities with fewer indigent patients – but this sug-

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[65] Dwayne A. Banks et al., *Uncompensated Hospital Care: Charitable Mission
or Profitable Business Decision?*, HEALTH ECON., Mar.-Apr. 1997, at 135 (discussing
how for-profit hospitals treat uncompensated care).
[66] BRADFORD H. GRAY, THE PROFIT MOTIVE AND PATIENT CARE: THE CHANGING
ACCOUNTABILITY OF DOCTORS AND HOSPITALS (1991).
[67] *Id.*
[68] *Id.*
[69] Edward C. Norton & Douglas O. Staiger, *How Hospital Ownership Affects*
Access to Care for the Uninsured, 25 RAND J. ECON. 171 (1994).

gests that for-profit hospitals are subject to very much the same effective regulatory structure as nonprofit hospitals. On average, Norton and Staiger found uncompensated patients accounted for 5.2% of total admissions in for-profit hospitals, compared with 6.1% in nonprofit hospitals.[70]

The more recent study by Banks, Wendel, and Paterson develops a more sophisticated model of for-profit hospital behavior, once again assuming that for-profit hospitals treat uncompensated care as a cost of doing business.[71] These researchers also found strong empirical support for the "cost-of-doing-business" rationale.[72]

Thus, there is not only strong institutional evidence that for-profit hospitals feel strongly obligated to provide uncompensated care, but also clear, unambiguous evidence that they provide such care in substantial quantities – almost as high as amounts provided by nonprofit hospitals.

Why would for-profit hospital managers choose to give away shareholders money in the form of uncompensated care if they were not required to do so? If this is the case, how can it be claimed that there is no regulation forcing cross-subsidization in hospital care? The evidence in this area would seem quite clear: hospitals behave as if they were regulated to provide uncompensated care, and for our purposes, this is equivalent to regulation.

VI. FIRM RIVALRY AND THE EROSION OF CROSS-SUBSIDIZATION

In the transportation industries, firm rivalry, in either the price dimension or the service quality dimensions, within modes or between modes, tended to dissipate the rents which were supposed to be used to cross-subsidize over time (this is often called cream-skimming). In the case of railroads, competition from trucks dissipated the rents on high-valued commodities which the ICC expected railroads to spend on deficits for high-valued goods and for passenger service. In the case of airlines, service quality rivalry (frequency, capacity, and luxury) dissipated the rents which were to be used to cross-subsidize low-density and short-haul service. Indeed, in the last days of regulation, airlines were never able to earn more than an "average" return on investment, and they were constantly trying to escape provision low-density services. Rail-

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[70] *Id.* at 177.
[71] *See generally* Banks et al., *supra* note 65, at 133-43.
[72] *Id.*

roads earned below-normal returns and, before Amtrak and the Staggers Rail Act of 1980,[73] had much difficulty abandoning unprofitable branch lines and discontinuing passenger services.

Models of uncompensated care provision in hospitals do sometimes (but not always) predict the reduction of uncompensated care with increased competition, and, indeed, Gruber's[74] analysis finds evidence that this will happen. However, none have even considered the possibility (which is indeed a probability, based on experience in transportation and telecommunications) that competition could, over time, eliminate the ability of hospitals to cross-subsidize indigent patients.

To understand why existing models of hospital behavior do not consider the possibility that competition could eliminate cross-subsidization, we must consider in some detail the model of Frank and Salkever,[75] of which the models underlying several other studies of uncompensated care are extensions.[76]

Richard Frank and David Salkever – and each study above – assume that the hospital is a competitive firm with a flat demand curve and an upward-sloping marginal cost curve; the equilibrium always entails price equals marginal cost.[77] In the Frank and Salkever model, as well as the others, profits used to cross-subsidize indigent patients stem from the assumption that the price which the hospitals are allowed to charge (by market forces, regulators, or others) will always be above-average cost.[78] Indeed, if marginal cost is uniformly increasing, and there are no fixed costs, then such profits will always exist, to some degree. However, in the more conventional (and realistic) case of a U-shaped cost curve, there is no guarantee that such profits will indeed exist. In fact, in the case of a competitive market, as all elementary economics students are taught, market equilibrium entails zero profits, with price at average cost (equal to marginal cost at the point of equilibrium). Hence, it is by no means clear that in a model such as

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[73] 49 U.S.C. § 10101 (1991) (providing for the restoration, maintenance, and improvement of the physical facilities and financial stability of the U.S. rail system).

[74] Jonathan Gruber, *The Effects of Competitive Pressure on Charity: Hospital Responses to Price Shopping in California*, 13 J. HEALTH ECON. 183, 184 (1994).

[75] Richard G. Frank & David S. Salkever, *The Supply of Charity Services by Nonprofit Hospitals: Motives and Market Structure*, 22 RAND J. ECON. 430 (1991).

[76] *See generally* Gruber, *supra* note 74; Norton & Staiger, *supra* note 69; Banks et al., *supra* note 65.

[77] Frank & Salkever, *supra* note 75, at 433.

[78] *Id.*

that of Frank and Salkever that a hospital will generally have the revenues to cross-subsidize indigent care.

In addition, some observers believe the marginal cost of treating indigent patients is below-average cost. However, this depends on either scale economies (of which there is very little evidence) or excess capacity (that is, marginal cost can be below average cost due to excess capacity). That is likely to be a temporary situation: without government subsidies, firms will go out of business if price is below long-run average cost for a significant length of time (and many hospitals are closing, and many more should close and will close).[79] In short, Frank and Salkever and most subsequent models of uncompensated care make the assumption that the price paid by insured or self-paying patients will stay above the long-run average cost. However, they fail to indicate what forces will keep it there.

Those who expect hospitals to cross-subsidize indigent patients, while at the same time facing the full-force of competition in the marketplace for paying patients, must present a model and evidence to support this notion – especially in the long-run. We have not seen such a model, and evidence from other industries indicates that more regulation would at best be an inefficient choice, and to some degree an ineffective way of achieving this goal.

VII. CONCLUSIONS AND POLICY IMPLICATIONS

We have several important conclusions, suggestions for further research, and implications for public policy. We have presented much evidence that several parallels exist in health care regulation, relative to that which occurred in transportation and telecommunications. Regulation and similar public policies endeavor to encourage – as in Medicare and tax laws – or force – as in COBRA and anti-dumping laws – cross-subsidization in hospital care. However, these policies risk being undermined in hospital care, much as they were in transportation some twenty-five years ago.

This means that we will need to rely more and more on direct support of indigent patients, rather than on cross-subsidies (cases

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[79] *See generally* Theodore E. Keeler & John S. Ying, *Hospital Costs and Excess Bed Capacity: A Statistical Analysis*, 78 REV. ECON & STAT. 470 (1996) (suggesting that the government should stop preventing hospital closings and consolidations which eliminate excess capacity and reduces costs).

of Oregon and Minnesota are relevant; also, New Jersey now uses direct taxes rather than cross-subsidization for indigent care). We cannot "have our cake and eat it too" – the benefits of competition and cross-subsidization do not coincide (this is only one dimension of health care in which we cannot "have our cake and eat it too").

Our conclusions on this count are quite similar to those of Colombo and Hall[80] and of Krause,[81] all of whom cite further problems (beyond the ones discussed here) with the use of laws relating to nonprofit organizations to encourage cross-subsidization of indigent patients.

This implies, as well, that policies to maintain cross-subsidization in hospital care or health maintenance organizations are misguided, because they are unlikely to work, based on evidence thus far in health care – as well as experience in transportation and telecommunications. The "market forces" that brought an end to cross-subsidies in transportation, and their substantial reduction in telecommunications, are at work in the health care sector. Thus, if our analogy is correct, we predict increasing pressures for "deregulation" in health care, similar to that which occurred in transportation and telecommunication. This has been occurring incrementally, beginning with the elimination of CON laws and hospital rate-setting programs in some states.

Moreover, further research should investigate the welfare loss from market distortions produced by "sick taxes" (cross-subsidies are taxes on paying sick patients); the welfare losses from such taxes are likely to be large, compared with those from broader-based taxes. Replacement of cross-subsidies with direct subsidies should in any event provide significant welfare gains, from enhanced economic efficiency. Direct subsidies are also better controlled by the electorate.

A final conclusion relates to the inappropriateness of additional regulation in health care. Some policy-makers may want to reverse the trend to deregulate hospital care, by constructing a system of additional regulations to bolster the currently failing scheme of cross-subsidization. The evidence we have presented here indicates that this would be a serious mistake.

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[80] *See generally* Colombo & Hall, *supra* note 3, at 34 (concluding that the issue of hospital exemption is best resolved in the context of a thorough review and revision of national healthcare delivery policy).

[81] *See* Krause, *supra* note 2, at 568 (stating that regulation under the Nonprofit Hospital Sales Acts "will be costly to implement and will promote meaningless and destructive litigation").

Table 1. Descriptive Statistics for Study Variables

Variable	Mean	Std Dev	Minimum	Maximum	Measure
Cost	$29,572,097	$36,270,906	$381,180	$377,617,194	Total expend
INDI	2,820.14	9,838.26	0.00	186,655.00	Indigent days
MEDCD	7,803.48	14,785.10	0.00	203,137.00	Medicaid days
MEDCR	14,462.10	15,091.53	0.00	129,801.00	Medicare days
PRIV	15,750.10	18,701.00	11.88	158,504.00	Private pay days
OUT	14,296.05	43,882.11	0.00	482,120.00	Outpatient visits
BEDS	192.62	182.51	12.00	2,045.00	Bed Size
ALOS	6.52	6.34	1.02	149.92	Av. length of stay
WAGE	$7.03	2.21	$0.67	$33.87	Av. hourly wage
NON	0.45	0.50	0.00	1.00	Nonprofit dummy
PUB	0.08	0.27	0.00	1.00	Public

					dummy
DIS	0.14	0.35	0.00	1.00	District dummy
DUMMY	0.01	0.09	0.00	1.00	No indigent care
T	7.95	1.42	6.00	10.00	Time trend

Table 2. Hospitals in Sample

Year	nonprofit	for-profit	district	public
1986-87	185	137	53	29
1987-88	171	123	55	30
1988-89	168	123	55	30
1989-90	170	116	55	30
1990-91	170	116	53	30

Table 3: Regression results of impact of indigent care on hospital cost, for California's acute care hospitals, spanning FY1986-FY1990.

Variable	parameter[1] estimates w/ beds	parameter[2] estimates w/o beds
INTERCEPT	20080673	1991148
	(494490.3)	(494810.3)
OUTPUT VARIABLES		
INDI	1399.99	1718.67
	(97.03)	(20.76)
MEDCD	179.67	267.93
	(51.08)	(49.52)
MEDCR	601.5	666.08
	(37.57)	(30.2)
PRIV	674.39	760.66
	(40.3)	(32.88)
OUT	114.18	122.64
	(17.04)	(16.91)
CONTROL VARIABLES		
WAGE	520299.18	531092.69

		(22781.8)	(20056.9)
BEDS		24559.35	-------
		(5818.1)	
ALOS		-320913.66	-130722.67
		(134809.9)	(133644.4)
NON		99599.26	-248082.4
		(392993.7)	(395573.8)
DIS		-1218289.1	-1659961.9
		(508552.1)	(502345.6)
PUB		-8129853.57	-9162288.1
		(861609.4)	(871422.6)
DUMMY		-378553.48	-483862.4
		(1949239)	(1985420.1)
TIME		645689.51	625608.9
		(177254.5)	(181067.6)
OUTPUT	INTERACTIONS		
INDI*INDI		0.023	0.018
		(0.003)	(0.002)
INDI*OUT		-0.008	-0.008
		(0.001)	(0.001)
INDI*PRIV		-0.004	-0.005
		(0.004)	(0.002)

INDI*MEDCR	0.041	0.03
	(0.005)	(0.004)
INDI*MEDCD	(0.012)	(0.021)
	(0.004)	(0.003)
MEDCD*MEDCD	-0.0004	-0.0004
	(0.002)	(0.001)
MEDCD*MEDCR	-0.025	-0.016
	(0.002)	(0.002)
MEDCD*PRIV	0.006	0.008
	(0.002)	(0.001)
MEDCD*OUT	0.004	0.004
	(0.001)	(0.001)
PRIV*PRIV	-0.007	-0.004
	(0.001)	(0.001)
PRIV*OUT	0.004	0.004
	(0.001)	(0.001)
PRIV*MEDCR	-0.0005	-0.003
	(0.002)	(0.001)
OUT*OUT	-0.0001	-0.0004
	0	(0.0001)
OUT*MEDCR	-0.003	-0.003
	(0.001)	(0.001)

MEDCR*MEDCR	-0.007	-0.003
	(0.002)	(0.001)
OUTPUT AND CONTROL VARIABLES		INTERACTIONS
INDI*BEDS	-1.3	----
	(0.64)	
MEDCD*BEDS	1.43	----
	(0.37)	
MEDCR*BEDS	1.81	----
	(0.44)	
PRIV*BEDS	1.65	----
	(0.36)	
OUT*BEDS	0.01	----
	(0.09)	
WAGE*BEDS	428.49	----
	(236.66)	
ALOS*BEDS	-192.16	----
	(1017.9)	
TIME*BEDS	-1266	----
	(2301.7)	
BEDS*BEDS	-178.93	----
	(38.67)	
INDI*ALOS	-34.06	-27.15

	(36.82)	(36.16)
MEDCD*ALOS	-24.99	-28.51
	(5.43)	(5.08)
MEDCR*ALOS	-20.63	-9.79
	(9.65)	(8.58)
PRIV*ALOS	-35.94	-33.55
	(6.96)	(5.76)
OUT*ALOS	29.68	27.41
	(4.33)	(4.43)
WAGE*ALOS	-3555.14	-3354.23
	(1987.4)	(1721.2)
TIME*ALOS	-45841.28	-44625.16
	(22964.2)	(23007)
ALOS*ALOS	1169.24	1120.13
	(575.67)	(590.53)
INDI*WAGE	1.93	3.68
	(2.65)	(1.92)
MEDCD*WAGE	13.26	14
	(1.63)	(1.35)
MEDCR*WAGE	15.44	17.52
	(1.71)	(1.06)
PRIV*WAGE	10.24	11.61

	(1.22)	(0.9)
OUT*WAGE	2.84	2.05
	(0.46)	(0.4)
TIME*WAGE	33549.78	30487.37
	(8963.8)	(7805.5)
WAGE*WAGE	46279.34	49540.58
	(5112.39)	(4453.3)
INDI*TIME	27.95	27.6
	(36.15)	(35.03)
MEDCD*TIME	10.89	9.51
	(15.72)	(15.57)
MEDCR*TIME	16.82	12.8
	(15.34)	(11.64)
PRIV*TIME	9.6	12.31
	(13.51)	(10.54)
OUT*TIME	-2.08	-5.48
	(4.77)	(4.8)
TIME*TIME	138267.3	169585.48
	(90410.8)	(92804.3)
R-squared	0.9674	0.9651
Adjusted R-squared		0.8731
Observations (NT)		1891

Table 4. Average Uncompensated care Expenditures as a Per Cent of Revenue and
Expenditures for California Acute Care Hospitals, Fiscal Years 1986-1990

Hospital type	Per Cent Uncompensated Care with Beds in Cost Equation[a]		Per Cent Uncompensated Care without Beds in Cost Equation[b]	
	as per cent of revenue	as per cent of expenditures	as per cent of revenue	as per cent of expenditures
Nonprofit	3.1	3.1	3.8	3.8
For Profit	2.5	2.3	3.1	2.9
District	2.2	2.2	2.7	2.7
Public	26.6	20.3	32.7	24.9

a. Based on a marginal cost estimate of $1,399.90
b. Based on a marginal cost estimate of $1,718.67