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Author: Jason Barro, Michael Chu

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HMO Penetration, Ownership Status, and the Rise of Hospital Advertising

Jason R. Barro and Michael Chu

3.1 Introduction

Advertising is a pervasive component of many product markets in the United States, from soda to real estate to clothing. Until recently, the providers of health care in America had been conspicuously absent in this activity. In fact, for a great deal of the last century, advertising by physicians and hospitals was explicitly banned by their respective professional organizations. In the American Medical Association's (AMA's) first code of ethics, it was written that "[advertising is] highly reprehensible in a regular physician" (AMA 1848).

Although still relatively small compared with other industries,¹ advertising among hospitals has increased dramatically in recent years. Figure 3.1 shows average advertising expenditures among hospitals in the United States from 1995 to 1998. Of the roughly 5,000 acute care hospitals in the United States, 1,800 advertised in 1995. Among those hospitals, the average advertising budget was \$79,000. By 1998, 2,500 hospitals advertised, and the average spending among those hospitals had increased by 56 percent in real dollars to \$123,000 per hospital (Video Monitoring Services

Jason R. Barro is assistant professor of business administration at Harvard Business School and a faculty research fellow of the National Bureau of Economic Research. Michael Chu is an analyst at Credit Suisse First Boston.

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1. Hospital advertising is, on average, 0.1–2.0 percent of hospital revenues. Other industries that are better known for their advertising have much larger advertising budgets. Soda companies, for instance, spend 7–8 percent of revenues on advertising. Car companies spend a little over 2 percent (CompuStat).

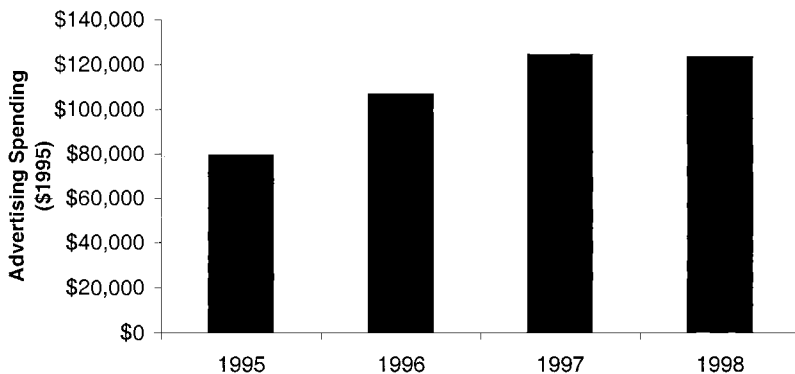


Fig. 3.1 Average hospital advertising spending, 1995–1998

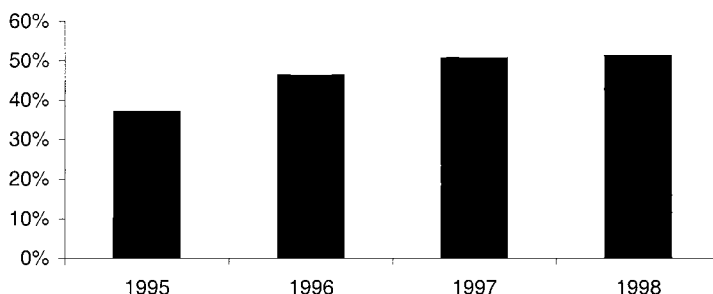


Fig. 3.2 Percentage of hospitals that advertise, 1995–1998

[VMS]). Over this same period, average hospital expenditures increased by only 10 percent in real terms (American Hospital Association [AHA] 1995–98). Figure 3.2 illustrates the increase in participation in advertising for hospitals over this time period. Less than 40 percent of hospitals advertised in 1995, compared with a little more than half by 1998.

Average advertising spending across all hospitals masks the most dramatic increase. Figure 3.3 breaks out the hospitals into five categories: not-for-profit teaching hospitals, other not-for-profit hospitals, for-profit hospitals, religious hospitals, and public hospitals. Figure 3.3 illustrates that the true source of the overall advertising increase among U.S. hospitals has been the not-for-profit teaching hospitals. The spending levels in figure 3.3 are adjusted for bed size so that any differences in ad spending due to differences in hospital size are removed. The average not-for-profit teaching hospital has increased its bed-adjusted ad expenditures by 140 percent. For-profit hospitals, however, have actually decreased their spending in real terms over this time.

In this paper, we examine the underlying cause of this rapid increase in

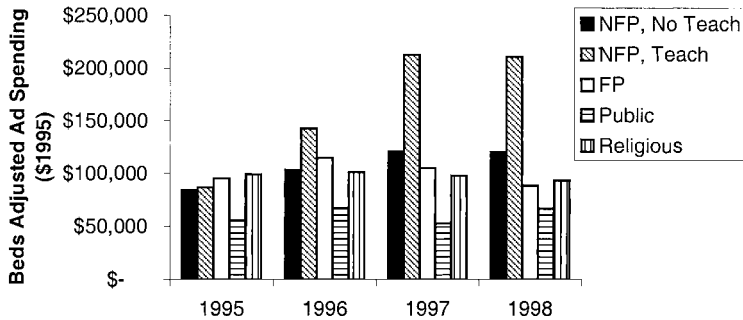


Fig. 3.3 Average advertising spending by hospital type, 1995–1998

advertising among hospitals. We utilize a panel data set of hospital and market characteristics along with a unique data set of hospital advertising expenditures. In the end, a critical component of the explanation is the rise of managed care across the country. Those hospitals—particularly the large teaching hospitals—in markets that have experienced the greatest rise in managed care influence had the most rapid increase in advertising.

The paper continues as follows. The next section discusses the history of hospital advertising along with a discussion of the economics behind advertising for hospitals. The third section presents various hypotheses as to why hospitals would have changed their advertising behavior at this time. In the fourth section, we discuss the data. The fifth section presents the empirical results, and the final section concludes.

3.2 The History and Economics of Hospital Advertising

One basic model of health care consumption in the United States involves patients' depending on their physicians as well-informed, benevolent agents. When a patient needs to receive treatment in a hospital, the physician suggests the course of treatment and the hospital in which it will be done. Within this view of medical care, advertising directly to patients can play very little positive role and may, in fact, be detrimental to patient outcomes.

If the advertising signals lead the patient to disagree with the well-informed, benevolent physician, then the patient may seek alternative treatments. This may be positive if the physician was not fully informed or if the physician was not truly acting in the patient's best interest. But if the physician was truly acting in the patient's best interest, then the patient will only disagree with the physician's choices when the advertising is false and the patient is unable to determine its veracity. This appears to have been the argument behind the restriction of advertising by hospitals and physicians for the bulk of the twentieth century.

In 1847, when the AMA discussed advertising in its Code of Ethics, the concerns focused on exaggerated or outright fictitious claims perpetrated by some supposed healers. Until the late 1970s, the AMA, as well as the AHA, explicitly banned advertising for its members. A successful Federal Trade Commission suit in 1980 made advertising a legal, if not accepted, part of medical care. Prior to the final decision, the AHA had already decided to allow some regulated advertising for its member hospitals, as long as the “truthful” advertising was not done at the “expense of the competitor” (Rosenstein 1985, 34). Even now the AMA is careful to remind its members that although there are no restrictions on advertising, there is a concern that the public will be easily “deceived” and that information transmitted to the public should be done in a “readily comprehensible manner” (AMA 1848).

3.2.1 Not-for-Profit Hospitals and Advertising

Prior to the recent upsurge in advertising, not-for-profit hospitals historically engaged in less advertising than their for-profit counterparts. Figure 3.3 shows that, at the beginning of our sample in 1995, not-for-profits advertised less than for-profits, adjusting for the size of the hospital. The anecdotal evidence, and the fact that the AMA and the AHA had so long banned the practice, suggests that not-for-profits had never relied on advertising in the hospital industry. The nonreliance on advertising among not-for-profit hospitals has several possible explanations.

A situation in which not-for-profits all choose to do little advertising requires some degree of collusion among the market participants. Two facts about not-for-profit hospitals may help the hospitals collude not to advertise: First, not-for-profits are typically thought to have more complicated objective functions than the typical profit-maximizing for-profit hospital, and second, once a not-for-profit generates profits, it is restricted in how those profits are distributed. Both of these facts may make it easier to reach a collusive agreement in which the hospitals are essentially agreeing not to attempt to increase profits.

There are many theories suggesting that the managers at not-for-profits may care less about profits and are instead concerned with the provision of public goods, such as charity care and research (Weisbrod 1988), or are concerned with providing high-quality care (Hansmann 1980). According to those theories, hospital managers may not advertise because the increased profits that the advertising brings are not the core concern of those operating the organization. The nondistribution constraint also may create less of an incentive for management to increase profits, since there are no official owners to distribute the money.

Additionally, the managers at not-for-profits may simply feel that advertising, in its own right, is not an honorable activity. This is consistent with the historical view of the AMA and the AHA. Hospital managers may like

profits because they help the hospital provide all of the services they want to provide, but some methods of achieving that profitability are simply not worth the moral cost.

Finally, not-for-profit managers may enjoy spending their time on activities other than marketing and advertising. Without the pressure to do all that is necessary to maximize profits, perhaps the managers would simply prefer to use their time to do other things—focus on medical services, research, and so on. Regardless of which reason was the principle reason behind the historically low level of advertising among hospitals prior to the 1990s, something has occurred to change the reality in the health care marketplace.

3.3 Theories of Advertising Changes

There are several possible explanations for the current rise in hospital advertising. The first possibility is the unraveling from one equilibrium, in which few hospitals advertise, to another in which many hospitals advertise. Perhaps all hospitals, particularly the large teaching hospitals, would do little advertising as long as all of the other hospitals followed suit. Once that equilibrium begins to unravel, it will unravel quickly; hence the rapid increase in advertising.

Another hypothesis may be that the not-for-profit hospitals have undergone a fundamental change in their objectives. One explanation as to why hospitals have historically done so little advertising, as we indicated above, is that marketing is unbecoming for a not-for-profit institution—hence the statement in the code of ethics. The corollary to that idea is that marketing is a perfectly acceptable activity for an organization concerned with profits. Perhaps advertising is increasing because for-profit hospitals and their ethics are becoming more dominant in today's hospital market. This hypothesis leads to two predictions. First, for-profit hospitals should advertise more than not-for-profits, and second, advertising should increase more rapidly for not-for-profit hospitals that have more contact with for-profit competitors.

Another explanation is that hospitals and their executives are more willing to engage in activities, such as advertising, that were once shunned because the new financial realities in health care have made them necessary. If the financial strains become large enough, the choice for the hospital can be to stay open and advertise, or not to advertise and either close or curtail valued activities. The financial situation for hospitals has gradually deteriorated through the 1980s and 1990s as reimbursements from government and private payers have decreased. In addition to price reductions, hospitals have experienced a steady decline in admissions and inpatient days. This decline has been caused by technological improvements that have rendered some inpatient procedures obsolete (e.g., cataract surgery) or have

greatly reduced the length of stay for other procedures. In addition, hospitals have faced pressures from managed care organizations to reduce lengths of stay. The result has been that inpatient days in U.S. hospitals have fallen by roughly 35 percent over the last twenty years (AHA 1995–98).

A final hypothesis is that changes in the market structure and the manner in which hospital reimbursements are determined have resulted in an increased return to advertising. Perhaps the return to hospital advertising had historically been very low, and the hospital executives chose not to advertise because they had little to gain. If the marketplace changes such that there are significant gains to be had by advertising, then hospital managers will begin to advertise.

One major change in the health care market structure over the last twenty years has been the rise of managed care. In 1998, health maintenance organizations (HMOs) provided health insurance to roughly 30 percent of the U.S. marketplace (InterStudy 1998). Only four years earlier, that percentage was less than 20 percent, and twenty years ago, that percentage was essentially zero. Health maintenance organizations reduce health care costs, at least in part, by negotiating lower reimbursement rates with providers. They achieve leverage in those negotiations by only offering a subset of a market's providers in their ultimate network. It is the threat to leave a provider out of the network that provides HMOs with their power.

In a market with managed care organizations, advertising can potentially provide leverage to the providers. The threat for managed care companies to leave providers out of the networks is much more empty to the extent that providers can render themselves indispensable in the eyes of the patients. In the extreme, if an insurer has very little chance of being able to sell a product that lacks one key hospital, then that hospital has all of the power in setting the reimbursement fees. Advertising directly to patients may be a tool for the hospitals in creating this sense of necessity. The rise of managed care has increased the returns to advertising to the extent that advertising plays this new role in the negotiation process between hospitals and managed care.

In the sections that follow, we test several of the hypotheses outlined above. Given the large variation across hospitals and hospital markets, it is possible to test each of the hypotheses empirically. The *change in objective function* hypothesis can be tested using variation across markets in the influence of for-profit hospitals. In particular, those markets that have experienced the greatest increase in for-profit influence should have the greatest impact on the objectives of the other hospitals in the market.

CHANGE IN OBJECTIVE FUNCTION HYPOTHESIS. *Not-for-profit hospitals with more and increasing contact with for-profit hospitals will advertise more.*

The *financial distress* hypothesis can be tested using variation in financial performance across hospitals and using differences in market structure

changes across markets. Theoretically, if the financial distress story is driving the change in hospital advertising, then hospitals that experience more financial distress should advertise more. The alternative story is that hospitals with less money will do less of everything, including advertising.

FINANCIAL DISTRESS HYPOTHESIS. *Hospitals in financial distress will respond by increasing advertising expenditures.*

The penetration of HMOs into markets is a form of financial distress for hospitals. This means that the relationship between HMO penetration and hospital advertising will combine two effects: the effect of financial distress and the effect of HMO presence on the returns to advertising. Empirically, it is possible to disentangle these two effects if the returns to advertising do not change universally for all hospitals.

In the *increasing returns to advertising* hypothesis, advertising by hospitals would focus on hospital quality in order to create the sense of necessity among the patients. Some hospitals, particularly those that are large or are teaching hospitals, may be more credible in their advertising than others. Those hospitals for which their high-quality claims are more believable should increase their ad spending more than those hospitals for which their claims are less credible. The empirical test is then whether hospitals that are more likely to be credible (i.e., teaching and large hospitals) increase their advertising more in response to HMO penetration than do other hospitals.

INCREASED RETURNS TO ADVERTISING HYPOTHESIS. *More credible hospitals in markets with higher HMO penetration should respond with more advertising than other hospitals.*

We will not focus directly on the initial hypothesis that the increase in advertising is due to an equilibrium shift from no advertising to everyone advertising. If none of the other hypotheses were to be supported in the data, then the cascading equilibrium theory could be the explanation. Even if the other hypotheses prove to have some validity, it is impossible to prove that some form of equilibrium cascade did not occur. For instance, in the data, it appears that large teaching hospitals responded to increased HMO penetration by increasing ad spending. That provides support to the increasing returns hypothesis, and it may also be true that once some teaching hospitals decided to advertise, many others decided to follow. More generally, it may be that any of the other hypotheses can act as triggers in creating a cascade from one equilibrium to another. Additionally, if not-for-profit hospitals were not advertising before because their lack of concern for profits made collusion easier, then any change (in objective function, financial distress, or increased pressure from insurers) that would increase their concern for profits could lead to an equilibrium cascade.

3.4 Data

The data we employ in this paper come from four sources: the AHA, the Medicare Cost Reports, Interstudy, and VoiceTrak. Each source provides a panel of data across U.S. hospitals from 1995 to 1998. The AHA data contain information on hospital ownership, size, and location. The AHA data are also used to generate data characterizing a hospital's market, including information on the number of competitors. The Medicare data contain financial information for the hospitals, including revenues, expenses, and income numbers. The Interstudy data provide the information on HMO penetration over time at the metropolitan statistical area (MSA) level.

VoiceTrak is the source for the hospital advertising data (VMA): VoiceTrak surveys roughly 11,000 media outlets each year, achieving a response rate of over 85 percent by offering the respondents some of the survey results. VoiceTrak surveys radio, print, and television outlets and compiles an annual advertising spending number for each firm, including hospitals. The VoiceTrak data were merged with the other data sources to create a panel of roughly 5,000 hospitals over four years. Any advertising expenditures attributed to hospital holding companies or hospital networks were distributed among the member hospitals in the market, according to size and to the amount possible. The network and affiliation data in the AHA are far from complete. That should dampen the advertising numbers for hospitals more likely to be in networks, to the extent that some expenditures are not distributed.

3.5 Empirical Results

The first hypothesis as to why hospital advertising has increased in recent years is that the objectives of the hospitals have changed. In order to test this, we first examine whether hospitals of different ownership types in fact exhibit different behavior with respect to marketing. If the difference in advertising expenditures is caused by differences in objectives, then that is presumably driven by not-for-profits' having an objective function that differs from profit maximization. Most of the differences that would be proposed, such as ethical concerns, should lead to not-for-profits' advertising less than for-profits. If the objectives of the hospitals are changing, then not-for-profits should behave more like for-profits through time.

Table 3.1 presents results of a simple least-squares regression to illustrate the average advertising behavior by hospital types. The following regression is estimated:

$$(1) \quad \text{AdSpending}_{h,t} = \alpha + \gamma_t + \beta_1 \cdot \text{Beds} + \text{ForProfit}_{h,t} + \text{Pub}_{h,t} \\ + \text{TeachingHosp}_{h,t} + \varepsilon_{h,t}$$

Table 3.1 Relationships of Hospital Types To Hospital Advertising

| | (1) | (2) |
|-----------------------|------------------------------------|------------------------------------|
| Hospital beds | 443.9 (13.25) | 442.0 (13.20) |
| For-profit | 7,093.6 (1.68) | 10,091.3 (1.96) |
| Year interactions | | |
| 1996 | | 9,124.9 (1.88) |
| 1997 | | 4,346.1 (0.74) |
| 1998 | | -19,785.9 -(3.35) |
| Public | -20,653.3 -(5.14) | -8,610.0 -(2.26) |
| Year interactions | | |
| 1996 | | -9,837.8 -(3.24) |
| 1997 | | -19,751.6 -(4.90) |
| 1998 | | -20,281.1 -(4.40) |
| Teaching hospital | 48,183.4 (5.63) | -11,692.0 -(1.29) |
| Year interactions | | |
| 1996 | | 45,116.2 (5.85) |
| 1997 | | 98,315.0 (8.19) |
| 1998 | | 103,087.4 (8.36) |
| Year Effects | | |
| 1996 | 20,116.7 (11.66) | 13,078.6 (6.14) |
| 1997 | 35,103.3 (13.07) | 22,408.0 (7.89) |
| 1998 | 35,024.6 (12.51) | 23,777.5 (8.08) |
| Constant | -33,782.7 -(6.71) | -25,689.7 -(5.34) |
| <i>N</i> | 19,539 | 19,539 |
| <i>R</i> ² | 0.21 | 0.22 |

Note: Dependent variable-real hospital advertising expenditures. *T*-statistics in parentheses; boldface indicates significance at the 5 percent confidence level.

where h is “hospital” and t is “time.” The regression includes the VoiceTrak advertising expenditures as the dependent variable. The number of hospital beds as well as dummy variables indicating hospital ownership type are included on the right-hand side.

The results help illustrate that the general pattern is not entirely consistent with the change in objectives hypothesis. If the hypothesis is correct, for-profits should advertise more than not-for-profits, but the relationship should narrow over this period of time while advertising spending is increasing so rapidly. In the regressions, the omitted hospital category is nonteaching, not-for-profit hospitals. The regression in column (1) shows that, over the whole time period, for-profits do advertise more than nonteaching, not-for-profit hospitals and public hospitals, but less than teaching hospitals. The difference between for-profits and nonteaching not-for-profits is not significant at standard levels of significance.

The regression in column (2) presents results with each hospital type interacted with the year effects. These results highlight the regime shift in hospital advertising that was evident in figure 3.3. By the end of the period, for-profit hospitals advertise significantly *less* than all not-for-profit hospitals, and the teaching hospitals have increased their advertising expenditures significantly.

Again, this result is a little too strong for the change in objectives hypothesis, since the not-for-profits not only begin to advertise as much as the for-profits, but even surpass them. It is possible that a change in objectives could still be a driver behind the rise in advertising if it were true that the returns to advertising are higher for the not-for-profits and the teaching hospitals, in particular. Then, once all hospitals are comfortable advertising, the not-for-profits would actually do more, not just the same amount.

Another test of the change in objectives hypothesis is to see whether hospitals that interact more with for-profit hospitals advertise more. The assumption behind this theory is that not-for-profit hospitals have historically had an ethic of not advertising, while for-profit hospitals have not felt restricted with respect to marketing. As not-for-profit hospitals increasingly interact with for-profits, they may begin to absorb some of their behaviors. In table 3.2, the following fixed-effects regression is estimated:

$$(2) \text{ AdSpending}_{h,t} = \alpha_h + \gamma_t + \beta_1 \cdot \text{ForProfitMktShare}_{h,t} + \beta_2 X_{h,t} + \varepsilon_{h,t}$$

Again, the advertising expenditures are the dependent variable. Year and hospital fixed effects are included on the right-hand side along with other hospital and market characteristics including: ownership status (for-profit, public, or religious), teaching status, hospital occupancy rate, net income, and whether the hospital is a local monopoly (i.e., no other hospital within ten miles). The key variable of interest is the percentage of hospital beds in the hospital’s ten-mile market that are in for-profit hospitals—the for-profit market share. This variable, as well as interactions of this

Table 3.2 Advertising and For-Profit Market Share

| | (1) | (2) |
|--|------------------------------------|------------------------------------|
| For-profit | 24,153.35 (0.60) | 21,895.91 (0.55) |
| Public | 10,138.95 (0.88) | 9,911.42 (0.86) |
| Religious | 27,237.89 (1.61) | 27,305.66 (1.61) |
| Teach | | -489.59 (-0.04) |
| Hospital beds | 77.72 (0.75) | 78.11 (0.75) |
| For-profit market share in ten-mile market | 86,845.62 (1.88) | 78,777.74 (1.75) |
| Interactions | | |
| For-profit market share • For-Profit | -101,889.95 (-1.58) | -94,168.86 (-1.50) |
| For-profit market share • Public | -62,834.33 (-1.11) | -62,119.12 (-1.10) |
| For-profit market share • Religious | -72,150.87 (-0.69) | 28,076.80 (0.85) |
| For-profit market share • Teach | | -70,884.33 (-0.67) |
| Monopoly in ten-mile market | 5,988.82 (0.41) | 6,699.86 (0.46) |
| Occupancy rate | -7,985.25 (-0.65) | -7,995.76 (-0.65) |
| Net income | 0.00 (-1.02) | 0.00 (-1.02) |
| Year effects | | |
| 1996 | 19,526.48 (9.29) | 19,441.07 (9.26) |
| 1997 | 33,367.15 (10.46) | 33,309.83 (10.41) |
| 1998 | 33,870.10 (8.75) | 33,824.83 (8.73) |
| Constant | 23,509.50 (1.23) | 23,438.83 (1.23) |
| Hospital fixed effects | Yes | Yes |
| <i>N</i> | 15,791 | 15,791 |
| <i>R</i> ² | 0.78 | 0.78 |

Notes: Dependent variable-real hospital advertising expenditures. *T*-statistics in parentheses. Boldface indicates significance at the 5 percent confidence level. Standard errors are heteroscedasticity robust and clustered by hospital.

variable with the various ownership types, are included in the regression. The hypothesis is that as a hospital is increasingly interacting with for-profit hospitals, the more likely that hospital is to begin behaving as a for-profit.

The results are presented in table 3.2. The only difference between columns (1) and (2) is that teaching status is not included in the first regression. The coefficient on for-profit market share (86,845) represents the impact of increased for-profit market share on the omitted category—non-teaching, not-for-profit hospitals. This coefficient is marginally significant and positive, but the magnitude is small relative to the overall change in advertising. The result suggests that an increase in for-profit market share of 10 percent leads to an increase in advertising of \$8,600. The average change across hospitals in for-profit market share from 1994 to 1998 is less than 1 percent. The standard deviation is 15 percent, so there were some hospitals that experienced a significant increase in for-profit influence. The effect for teaching hospitals is essentially zero. Since the largest increase in hospital advertising over this time period has been from large teaching hospitals, the impact of for-profit hospitals does little to explain the general trend.

The coefficients on net income and occupancy rate are not significantly different from zero. This is the first test of the financial distress hypothesis. The regressions in table 3.2 provide no evidence that tougher financial conditions lead to an increase in advertising.

Table 3.3 presents results on the relationship between HMO penetration and hospital advertising. These results provide insight into both the financial distress hypothesis and the change in returns to advertising hypothesis. At one level, an increase in HMO penetration is a negative financial shock to hospitals. This may affect advertising in either direction. The financial distress hypothesis suggests that the rise in advertising may be due to increasing financial strain on hospitals. Alternatively, a strain on hospital budgets may require a decrease in all types of spending, including advertising. At another level, the presence of HMOs in the market may increase the returns to advertising. This affect may differ across hospitals, as some hospitals may have more credibility in their claims of high quality. The regressions in table 3.3 estimate the following regression:

$$(3) \quad \text{AdSpend}_{h,t} = \alpha_h + \gamma_t + \beta_1 \cdot \text{ForProfit}_{h,t} + \beta_2 \cdot \text{TeachingHosp}_{h,t} \\ + \beta_3 L_{h,t} + \beta_4 \cdot \text{TeachingHosp}_{h,t} \cdot L_{h,t} + \beta_5 \cdot \text{HMO}_{\text{MSA},t} \\ + \varepsilon_{h,t}$$

where L equals more than 200 beds. As with equation (2), the regression includes hospital and year fixed effects, as well as controls for hospital type and the HMO penetration at the MSA level. The regression in column (2) contains interaction terms between HMO penetration and the for-profit, teaching, large, and large-teaching variables.

The coefficient on the HMO penetration variable is the result of interest.

Table 3.3 Advertising and HMO Penetration

| | (1) | (2) |
|-------------------------------|-------------------------------------|-------------------------------------|
| Hospital beds | 129.97 (1.21) | 145.43 (1.38) |
| HMO penetration at MSA level | 52,735.47 (1.66) | -88,180.58 -(2.94) |
| HMO penetration interactions | | |
| For-profit | | -92,630.49 -(1.69) |
| Teach | | 249,337.49 (3.72) |
| Hospital beds > 200 | | 104,938.15 (1.75) |
| Teach and hospital beds > 200 | | 165,839.40 (2.21) |
| For-profit | -3,206.56 -(0.16) | 16,463.46 (0.76) |
| Teach | -3,597.88 -(0.24) | -88,083.94 -(3.83) |
| Hospital beds > 200 | 8,537.69 (0.53) | -40,640.50 -(1.85) |
| Year Effects | | |
| 1995 | -54,556.12 -(8.77) | -55,111.42 -(8.69) |
| 1996 | -20,026.40 -(3.60) | -20,373.52 -(3.63) |
| 1997 | 2,801.80 (0.63) | 3,640.46 0.81 |
| Constant | 92,948.34 (3.61) | 129,955.48 (5.17) |
| Hospital fixed effects | Yes | Yes |
| <i>N</i> | 10,387 | 10,387 |
| <i>R</i> ² | 0.76 | 0.77 |

Notes: Dependent variable—real hospital advertising expenditures. *T*-statistics in parentheses. Boldface indicates significance at the 5 percent confidence level. Standard errors are heteroscedasticity robust and clustered by hospital.

Without the interaction terms (column [1]), there is no significant relationship between HMO penetration and hospital advertising. The coefficient is positive, but not significant at normal levels. Once the interactions are included, an interesting pattern is revealed. The omitted group—nonteaching, not-for-profit hospitals—responds to increased HMO penetration by advertising less. Every 10 percent increase in HMO penetration leads to \$8,800 less in advertising. For-profit hospitals also respond to increased HMO penetration by advertising less, not more (as either the financial distress or the increased returns hypotheses would suggest). Increased financial distress appears to lead to less spending on advertising for small and for-profit hospitals.

The final groups—teaching and large hospitals—provide evidence consistent with the increased returns to advertising theory. Both teaching hospitals and large hospitals respond to increased HMO penetration with additional advertising. The effect for a large, nonteaching hospital is not significantly different from zero, although the effect is no longer negative as with the previous groups. For large teaching hospitals, the effect of HMO penetration on advertising is significant and large. Each 10 percent increase in HMO penetration leads to a \$43,000 increase in hospital advertising. Among large teaching hospitals, the average change in HMO penetration from 1995 to 1998 was 8 percent, with a standard deviation of 14 percent. On average, this category of hospitals increased its advertising spending by \$150,000. The increased influence of managed care appears to explain a significant percentage of that change.

3.6 Conclusions

The rise of hospital advertising in the late 1990s is best characterized by the significant increase in marketing activity by large, not-for-profit teaching hospitals. There is little evidence to suggest that any increased influence of for-profit hospitals explains the recent pattern in marketing behavior. Over this time period, for-profit hospitals have actually decreased their marketing expenditures. Nonteaching, not-for-profit hospitals that were exposed to more for-profit competition increased their ad expenditures in a marginally significant manner, but the magnitude of the effect is small.

Changes in managed care penetration are positively correlated with increased advertising, but only for the teaching hospitals (particularly for large teaching hospitals). For all other hospitals, increased managed care reduces ad spending, suggesting that HMOs represent a financial shock to hospitals. For the large teaching hospitals, the results, with respect to HMOs, suggest support for the increased return to advertising hypothesis. The presence of HMOs in the marketplace introduces a new negotiating dynamic, in which hospitals can attain higher reimbursement fees if they can dampen the HMOs' ability to threaten to leave them out of insurance contracts. Advertising directly to patients, if effective, can perhaps help to create a sense of necessity for a hospital. Only hospitals with credible high-quality claims (i.e., large teaching hospitals) will gain through this type of advertising. For all the other hospitals, HMOs are simply a financial shock, and, consequently, advertising expenditures should fall.

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