COMPETITION BETWEEN NON-PROFIT AND FOR-PROFIT HEALTH INSURERS*

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This study investigates the effects of tax, regulatory, and reimbursement policies and other factors exogenous to the health insurance market on the relative price (to commercial insurers) paid by Blue Cross plans for hospital care, their administrative expense and accounting profits, premiums, and ultimately Blue Cross market share. We specify and estimate a simultaneous equation model to assess interrelationships among these variables.

We conclude that premium tax advantages enjoyed by the Blues have virtually no effect on the Blues' premiums or their market shares. A Blue Cross plan's market share has a positive effect on the discount it obtains from hospitals as does coverage of Blue Shield charges by a state-mandated rate-setting plan. An upper bound on the effect on the Blue Cross market share of covering Blue Cross under rate-setting but excluding the commercials from such coverage is seven percentage points. Tests for administrative slack in the operation of Blue Cross plans yield mixed results.

1. Introduction

There are two dominant types of insurers in the market for private health insurance in the United States: Blue Cross and Blue Shield plans, all organized on a non-profit basis, and for profit or 'commercial' insurers. Judged in terms of shares of premium income or enrollees, commercial insurers have had a slightly higher share of the market, but in recent years, their share has fallen while the Blues' share has remained steady.¹ The rest of the market has been taken by independent prepaid and self-insured health plans, a rapidly growing category containing, among others, health maintenance organizations. In part because of their loss of share, the

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¹Carroll and Arnett (1981).

commercials have increasingly publicized the government-sanctioned competitive disadvantages they face in the market for health insurance.² Commercial insurers are virtually absent from the market in a few areas.

Government policy is not neutral in a number of ways. First, non-profit insurers are exempt from federal and state corporate income taxes and from state and local property taxes. The tax on premiums tends to be higher for commercial insurers than for the Blues. As of 1979, the median Blue Cross plan paid no premium taxes; for commercials, the median rate was two percent.³

Second, there are differences in premium regulation. State regulation of commercial premiums tends to focus on the adequacy of benefit-to-premium ratios of policies sold to individuals; commercial group insurance premiums tend to be unregulated. In contrast, state regulation of the Blues' rates tends to be on the total premium, not the benefit-to-premium ratio and applies to group as well as individual insurance. Regulation of the Blues' premiums might have a number of effects: if a plan is a monopoly, regulation might lower price and raise output; it might lead to tougher negotiations with hospitals and physicians and hence lower benefit payments. Of course, in principle, the plan could always do the latter even in the absence of premium regulation. It also may force the Blues to sell less complete insurance. Commercial insurers are subject to state reserve requirements, but few states impose such a rule on Blue plans. However, these requirements tend to be low,⁴ and certainly the presence of hundreds of commercial insurers in each state suggests there are no substantial regulatory barriers to entry.

Third, a few states have implemented mandatory controls over hospital rates. When Blue Cross is covered by such programs and other private insurers are not, Blue Cross can purchase hospital care at lower prices. This, as seen below, can be a substantial advantage for the Blues. To reduce or eliminate this source of competitive advantage, commercial insurers have recently stated quite clearly that they wish to have such controls apply to the hospital rates they pay as well.⁵

Fourth, while commercial insurers face few barriers to entry, Blue plans generally are the only non-profit organizations selling hospital (Blue Cross) and surgical/medical (Blue Shield) insurance of the fee-for-service variety. There are states in which the Blues have private insurance market shares as high as 60 to 80 percent. Although such shares would elicit antitrust actions in other sectors, there has historically been little activity here.⁶ This means

²See, for example, Health Insurance Association of America (1982).

³We have used the premium tax rate on foreign (out-of-state) insurers from National Association of Life Underwriters (1981). The rate applied to domestic insurers is somewhat lower.

⁴Hays (1981).

⁵Health Insurance Association of America (1982).

⁶See Heitler and Ader (1981) for a review.

that a Blue Cross plan typically has substantially more leverage in negotiating with hospitals over price than any of its commercial competitors. In fact, this may be the largest competitive advantage of all, but, with one exception, no one has assessed the impact of this factor on market outcomes.⁷

Several explanations have been offered to explain why, in the face of competitive advantages, commercial insurers have not been driven from the market. First, some have argued that the Blues have spent their advantage on administrative slack. Results of empirical tests for slack have been mixed, however.⁸ Second, the Blues have had a philosophical preference for insurance with little or no patient cost sharing and for community- rather than experience-rating. Some of its advantage may be spent providing insurance not desired by consumers. This is a compelling argument, but more so in the past than currently. In recent years, the Blues have introduced some copayment, used experience-rating more extensively, and have sponsored health maintenance organizations.⁹ Nevertheless, substantial differences in product emphasis remain.¹⁰

Third, there have been long-standing relationships between Blue plans and hospital and physician associations, and a large percentage of board members of these plans have been health care providers. When such plans have a competitive advantage, which is always true to a greater or lesser extent, they may spend the differences on higher prices for hospital and/or doctor services. There is some empirical evidence in support of this hypothesis. Some studies have correctly noted that hospital or physician control of Blue plans is more consequential in states where the Blues' competitive advantage is largest.¹¹ But past studies have focused on premium tax differences as the major source of such advantage, and tax differences alone may not be sufficiently large to give an appreciable competitive advantage to the Blues. At least as, if not more, important are sizable discounts some plans obtain from hospitals. Of course, the discounts may in part be an indirect effect of the preferential tax treatment accorded the Blues.

This paper investigates the effect of selected tax and regulatory policies and other factors exogenous to the health insurance market on the relative (to the commercials) price paid by Blue Cross plans for hospital care, their

⁷Feldman and Greenberg (1981b).

⁸See Blair et al. (1975a, b), Frech (1976), Hays (1981), Kass and Pautler (1981), and Vogel (1977).

⁹Yet a number of plans still sell a substantial amount of community-rated insurance.

¹⁰According to Howard Berman (1978, p. 193), formerly Vice President, Blue Cross Association: 'If the buyer feels that access to care and service benefits are important and that he is getting value, he opts for the Blue Cross Plan product. If he wants lesser coverage, he opts for a different segment of the market.'

¹¹Arnould and Eisenstadt (1981) and Eisenstadt and Kennedy (1981). For a contrary view, see Lynk (1981).

administrative expense and accounting profits, premiums, and ultimately Blue Cross market share. We specify and estimate a simultaneous equation model to assess interrelationships among these variables. The observational unit is the Blue Cross plan, and the year is 1979. We focus on Blue Cross rather than on Blue Shield since we are particularly interested in exploring the role of hospital discounts.

Section 2 provides additional background information on Blue Cross discounts and describes the model and empirical specification. Section 3 contains the estimated parameters of the structural equations and reduced form estimates. Section 4 provides a further discussion of our results and policy implications.

2. Background, model, and data empirical specification

2.1. *Blue Cross discount*

As of 1979 there were 68 Blue Cross plans in the 48 contiguous states.¹² Individual plans have reimbursement contracts negotiated with state hospital associations, metropolitan hospital associations, and/or individual hospitals.¹³ The three main methods of reimbursement are: retrospective charge- and cost-based payment, and prospective payment. The essential difference between retrospective and prospective payment is that, under the latter, prices are fixed by a party external to the hospital in advance and, if the hospital can produce care for less, it can keep at least some of the difference. Under retrospective payment, higher costs or charges generate additional revenue for the hospital. According to the 1979 American Hospital Association (AHA) Survey of Hospital-Blue Cross Contract Provisions, retrospective charge-based contracts are the most common (in terms of actual contracts). Most of these contracts pay 100 percent of hospital charges incurred on behalf of covered patients. Those which do not pay 100 percent typically receive an absolute discount of two or three percent of charges. Of particular concern to commercial insurers are those plans with retrospective cost-based or prospective contracts.¹⁴ Since no for-profit insurer pays on a cost basis, the Blues have a potential advantage when they can pay costs which are less than charges. The difference between the two is the hospital's accounting profit and more when certain elements of cost are disallowed by the cost payer. Prospective plans run by a few state governments have

¹²Blue Cross-Blue Shield (1980).

¹³See American Hospital Association (1979). AHA conducts periodic surveys of 'Hospital-Blue Cross Contract Provisions'. The AHA surveys mainly focus on the methods and elements of hospital reimbursement. Surveys were conducted in 1971, 1974, 1976, 1979, and 1981. Unless otherwise noted, specific references to contract provisions are based on the 1979 survey.

¹⁴See, for example, Robbins (1978).

caused commercial insurers particular concern when hospital charges to Blue plan patients are regulated and those to commercially-insured patients are not; the commercials see this as the source of a substantial competitive advantage for the Blues. In the Northeast, several plans had average 'discounts' from charges exceeding 20 percent (New York City had the highest with 32 percent). As noted above, some of these 'discounts' are the result of legally mandated prospective reimbursement programs.

Also in 1979, the AHA conducted the Reimbursement Survey of hospitals. Data from this survey indicate that, for the United States as a whole, hospitals actually received 86 percent of the amount they charged Blue Cross patients. The simple correlation between the 'discounts' from the two 1979 AHA surveys (one of Blue plans and the other of hospitals using the Blue Cross plan area as the observational unit) is 0.88. Only the Reimbursement Survey provides estimates of the percent of hospital charges paid by commercially insured patients. Mainly because of bad debts on the part of the charge not covered by the insurance policy, hospitals received 96 percent of charges from such patients in 1979 nationwide. The Blue discount relative to that of commercial insurers is a better measure of competitive advantage than the absolute Blue Cross discount. Only Reimbursement Survey data provide the necessary information on absolute discounts to calculate a relative discount. The mean relative Blue Cross discount is four percent (the plan rather than the hospital mean), and it ranges as high as 27 percent.¹⁵

2.2. *The model*

Since Blue Cross plans are organized as 'non-profit' firms, we assume that they set premiums to break even. That is, premium per enrollee equals claims plus administrative cost per enrollee less investment income per enrollee. A plan's claims cost per enrollee is equivalent to its payments to hospitals per enrollee. If the plan can obtain a discount from hospitals in the area it serves, payments for claims fall, *ceteris paribus*.

It is plausible that high market shares are a source of monopsony power for the Blues in the markets for hospital care and enable them to obtain larger discounts.¹⁶ The discount equation is then

$$D=f(S_B; X_j), \quad (1)$$

where D =Blue Cross discount, S_B =Blue Cross market share, and X_j are exogenous factors affecting the size of the discount. Our measure of market

¹⁵An appendix showing plan-specific absolute and relative discounts is available from the authors on request.

¹⁶This assumes, in the absence of discounts, that there is no relationship between hospital charges per enrollee and Blue Cross market share.

share is the fraction of the population in the Blue Cross plan area with Blue Cross insurance. A market share measure based on premium is not available by plan area but would definitely be highly correlated with the population-based measure.

Loading per enrollee is the sum of administrative costs per enrollee and accounting profits; the latter tend to be trivial for the Blues. Especially for this reason, we combine income gain (loss) with administrative expense.¹⁷ Blue Cross enrollment is the product of Blue Cross market share and area population; thus, if there are scale economies in processing enrollees and claims, an increase in market share should yield lower administrative expense per enrollee as well. The general form of the Blue Cross loading (L_B) equation is

$$L_B = g(S_B; Y_j), \quad (2)$$

where Y_j are exogenous factors which affect administrative expense and/or income.

By definition [using eqs. (1) and (2)], the Blue Cross premium (P_B) equals

$$P_B = (1 + t_B)(L_B + H[1 - D]), \quad (3)$$

where t_B is the premium tax rate on Blue Cross premiums and H is the mean hospital charge per enrollee. Eq. (3) is the Blue Cross supply curve.

Demand for Blue Cross coverage is a function of P_B and the 'quality-adjusted' premium for commercial hospital insurance coverage, P_C . By 'quality-adjusted', we mean the premium commercial insurers charge for coverage of the type Blue plans offer (complete coverage for inpatient care). The demand equation relates Blue Cross market share to the own (P_B) and cross-price (P_C) and other demand shift factors (Z_j),

$$S_B = h(P_B, P_C; Z_j). \quad (4)$$

Finally, the commercial premium (P_C) is defined in the same manner as its Blue counterpart above,

$$P_C = (1 + t_C)(L_C + H), \quad (5)$$

where t_C is the premium tax rate on commercial policies and L_C is the commercial loading factor. As defined, eq. (5) gives the amount commercials

¹⁷Summing over all Blue Cross plans, accounting profit amounted to less than six percent of total plan assets and less than three percent of net subscription income in 1979. Blue Cross-Blue Shield (1980, p. 9).

would charge for complete, or equivalently, payment-in-full coverage for hospital care.

We expect the demand function for S_B to be negatively sloping in P_B . However, because of the discount and/or economies of scale, the Blue Cross supply curve may also be negatively sloped. We discuss this matter more fully below.

2.3. Empirical specification

In this section we describe the empirical specification of eqs. (1), (2) and (4). Acronyms of frequently-used variables, and definitions and means of all variables are shown in table 1. Market areas are those of 66 individual Blue Cross plans.¹⁸

Discount equation. The dependent variable D is defined as the Blue Cross 'discount' relative to the commercial 'discount',

$$D = 1 - \frac{\text{Fraction of charge Blue Cross plan pays}}{\text{Fraction of charge commercial insurers pay}}.$$

Thus, for example, if in a plan area, Blue Cross receives a 10 percent discount from hospitals, and commercial plans in the same area have a corresponding effective discount of three percent, D has a value of slightly over 0.07. Data for D come from the 1979 AHA Reimbursement Survey. Bad debts are the main source of the commercial discount. In contrast, the Blue Cross discount reflects various disallowances and contractual adjustments and a trivial amount of bad debts.

The Blue Cross market share (S_B) is expected to have a positive effect on D . When payments to Blue Cross are regulated by a state-run mandatory prospective reimbursement program, the discount is likely to be relatively high, *ceteris paribus*. Separate binary variables indicate mandatory prospective reimbursement coverage of Blue Cross and commercial insurers.

The proportion of Medicare and Medicaid may affect the Blue Cross discount; these programs pay far less than full charges and, in recent years, far less than Blue Cross.¹⁹ One argument views the hospital as a price discriminating monopolist. Then a high share of publicly-insured patients is irrelevant; the hospital tries to obtain what it can from Blue Cross. An opposing argument is that when the government programs obtain substantial discounts, hospitals cannot afford to offer discounts to other payers. If so, a

¹⁸The Chicago and Rockford plans are combined into one observation. They merged in 1982. Wyoming is not included because of insufficient data; thus 66 observations are available for estimation. Alaska data have been removed from the Seattle plan.

¹⁹Sloan and Becker (1982).

Table 1
Variable definitions and means.^a

Variables	Means
<i>Endogenous</i>	
S_B Proportion of Blue Cross plan area population (under 65 years old) enrolled in the local Blue Cross plan	0.417
P_B Blue Cross premium (including premium taxes) per regular (under age 65) enrollee ^b	\$249.59
P_C Hospital premium of commercial insurers (including premium taxes) per protected person	\$252.37
L_B Blue Cross 'loading' per regular enrollee	\$17.38
D Blue Cross 'discount' relative to the 'discount' of commercial insurers	0.041
<i>Exogenous</i>	
t_B Premium tax rate on Blue Cross (percent)	0.3
t_C Premium tax rate on 'foreign' commercial insurers (percent)	2.2
Charges to Blue Cross patients covered by state-mandated hospital rate-setting program	0.182
Charges to commercially-insured patients covered by state-mandated hospital rate-setting program	0.182
Blue Cross premiums require approval by state insurance commissioner	0.818
Proportion of hospital inpatient days in Blue Cross plan area covered by Medicare and Medicaid	0.482
Community hospital beds per 1,000 Blue Cross plan area population	4.73
Proportion of Blue Cross plan area population in SMSAs	0.635
Proportion of state non-agricultural work force unionized	0.238
Local Blue Shield plan sells hospital coverage	0.106
Blue Cross plan sells medical/surgical coverage	0.106
Joint Blue Cross/Blue Shield plan financial data combined	0.379
Plan processes any Medicare Part B claims	0.379
Mean wage of service workers in local labor market	\$4.30
Blue Cross area population under age 65 (millions)	2.913
L_C Commercial 'loading' per protected person	\$44.03

^aAll monetarily expressed variables adjusted for differences in area prices. See Sloan and Steinwald (1980, app. B) for a description of the area price index.

^bThe mean for the Blue Cross premium per total enrollee is \$222.68. Although we have used P_B for estimation purposes, the lower figure is the appropriate one for comparing levels of premiums for Blue Cross and hospital insurance offered by commercial insurers. The commercials do not distinguish between enrollees under and over age 65.

high government insurance share implies a low D . The latter is the view of many non-economists in the health field who have stressed the importance of 'cost shifting' from public to private payers of hospital care.

The final variable is a measure of the position of the demand curve facing individual hospitals in the plan area; this variable takes account of the possibility of disequilibrium in the local hospital market. As the bed-to-population ratio rises, the individual hospital demand curve shifts inward, *ceteris paribus*, which makes the hospital more willing to grant price concessions to Blue Cross.

Loading equation. As noted above, the number of enrollees in a Blue Cross plan equals the product of S_B and area population. Both S_B and population are therefore explanatory variables in the loading equation. Also included are other variables to measure geographic differences in production cost: local wage rate; whether the plan processes Medicare Part B insurance claims;²⁰ whether the Blue Cross plan offers medical-surgical insurance as well as hospital insurance; and, for joint Blue Cross-Blue Shield plans, whether the financial data reported for Blue Cross and Blue Shield are combined.

Other investigators have hypothesized that the Blues' competitive advantages (e.g., preferential premium tax treatment) have been absorbed by 'administrative slack'. We include three variables to test this hypothesis: the relative discount (D), the premium tax rate applicable to the Blues (t_B), and the premium tax rates applicable to foreign (out-of-state) commercial insurance (t_C). A negative sign on t_B and positive signs on t_C and D would provide empirical evidence in support of the slack argument. A variable identifies states which require that the Blues' premiums be approved by state insurance commissioners.

Share equation. Both the own price of Blue Cross coverage (P_B) and the price of commercial hospital coverage of corresponding quality (P_C) are included as explanatory variables. We derived P_C using eq. (5). To accomplish this, we had to obtain estimates of H , the mean charge (to the Blue plan) per enrollee, and the loading for commercial insurance in the plan area (L_C).

To obtain H , we first divided total payments to non-federal short-term general hospitals in the plan area by population in the plan area. (The payment data are from the 1979 American Hospital Association Annual Survey.) Second, we took the mean value for the nation of the estimated mean values by plan area for H and computed a predicted Blue Cross premium for payment-in-full insurance for the United States as a whole, using mean values for L_B , D and t_B [eq. (3)]. The predicted Blue Cross

²⁰All Blue Cross plans process Medicare Part A claims.

premium exceeded the actual by about one-fourth, primarily because the AHA data includes hospital expenditures on persons over age 65, but expenditures on the elderly are not included in the Blue Cross premium data used in this study. Therefore, we scaled H so that mean predicted P_B equaled the mean actual P_B . We applied the same scaling factor for H in calculating P_C . To compute L_C , we computed the ratio of the Blue Cross–Blue Shield loading by state to the corresponding figure for commercial insurers in the same state from Health Insurance Association of America (1981). Let R be this ratio. We multiplied R by the loading for the Blue Cross plan to obtain plan area-specific estimates of L_C . We then applied eq. (5) to obtain our series for P_C .

Proportions of workers unionized and of the population living in SMSAs are included as exogenous demand shift variables. Previous investigators [e.g., Feldman and Greenberg (1981b)] have hypothesized that unions prefer to deal with non-profit organizations and/or like payment-in-full insurance coverage Blue plans offer. Thus, when a high proportion of the workforce is unionized, the Blue Cross market share should be higher on average. A Blue Cross market in which a Blue Shield plan also sells hospital insurance is represented by a binary variable. In preliminary regressions, we also included variables for community-rated plans, per capita income, age of population, but these variables were dropped at an early stage after showing no effect on the Blue Cross market share.

The structural equations have been estimated with two-stage least squares. The Blue Cross market share, discount, and loading (and hence the Blue Cross premium) are treated as endogenous variables. All equations are linear.

3. Empirical results

3.1. Structural equations

Table 2 presents estimated structural equations. A higher Blue Cross market share (S_B) raises the Blue Cross discount; the elasticity at the observational means is substantial, 1.8. In several variants of the discount regression not shown, we included an explanatory variable for the fraction of Blue Cross board members who represent the public (as opposed to provider members). The coefficient on the latter variable was positive and statistically significant, but the coefficient on the Blue Cross market share variable fell to zero. Although it is plausible that public members are better able to secure a discount from hospitals than when hospitals are represented on both sides of the bargaining table, it is not plausible that the market share does not affect the discount a Blue Cross plan obtains. Also, the high correlation between the Blue Cross market share and the proportion of public members on Blue Cross boards probably reflects an effect of share on board composition. As it

Table 2
Estimated structural equations.

	D	L_D	S_B
Constant	-0.25 ^b (0.11)	0.97 (16.10)	0.44 ^a (0.12)
Medicare-Medicaid share	0.31 (0.22)		
Bed-population ratio	0.015 (0.011)		
Rate-setting over Blue Cross	0.11 ^c (0.063)		
Rate-setting over commercials	-0.088 (0.063)		
Blue Cross premium approval		-0.76 (2.97)	
t_B		-3.54 ^a (1.85)	
t_C		0.55 (2.62)	
Wage rate		5.19 ^a (2.90)	
Population		-0.39 (0.60)	
Blue Cross and Blue Shield data combined		10.50 ^a (2.38)	
Plan processes Medicare claims		4.99 (3.08)	
Blue Cross sells insurance for MD services		6.22 (4.66)	
Fraction of persons in SMSAs			0.19 ^b (0.075)
Fraction of employees in union			0.69 ^a (0.22)
Blue Shield sells insurance for hospital services			-0.17 ^a (0.061)
P_C			-0.0001 (0.0006)
D		16.65 (42.17)	
S_B	0.18 ^b (0.08)	-27.10 ^c (14.76)	
P_B			-0.0011 ^b (0.0004)
	$R^2=0.21$ $\bar{R}^2=0.15$ $F(5,60)=3.2$	$R^2=0.56$ $\bar{R}^2=0.47$ $F(10,55)=6.9$	$R^2=0.52$ $\bar{R}^2=0.48$ $F(5,60)=13.2$

^aStatistically significant at one-percent level (two-tailed test).

^bStatistically significant at five-percent level (two-tailed test).

^cStatistically significant at ten-percent level (two-tailed test).

is likely to be responsive to share, board composition should probably be considered endogenous,²¹ but not enough is known about the underlying political process to permit proper specification of an equation to describe interplan differences in board mix. Thus, the role of board membership composition is best disregarded for now.

As anticipated, mandatory rate-setting covering Blue Cross increases the discount. When Blue Cross is the only private payer covered, the discount rises by 11 percentage points holding other factors constant. Extending such regulation to payments from commercially-insured sources largely neutralizes this effect. Although the Medicare–Medicaid hospital patient proportion and the bed-to-population ratio coefficients do not attain statistical significance at conventional levels, they suggest that hospitals are, if anything, more willing to accept a discount from Blue Cross when they have a high proportion of Medicare–Medicaid patients²² and in ‘overbedded’ areas.

The Blue Cross share also has a substantial negative effect on the Blue Cross loading (L_B); at the means, the share’s elasticity is 0.65. The insignificant coefficient on plan area population seems to contradict our result for the share. However, there are two reasons for believing there are scale economies in Blue Cross administration. First, when fewer variables are included in the equation, the population coefficient moves closer to statistical significance. Second, using dummy variables for plan size based on the number of enrollees, we found constant returns up to plan sizes of about a million enrollees and scale economies thereafter (regression not shown here).

Several previous studies have concluded that Blue plans spend their competitive advantage on administrative slack. The estimated L_B equation provides at most tentative support for this view. Although the tax on Blue Shield premiums (t_B) reduces loading per enrollee (with an associated elasticity at the mean of 0.06), a result consistent with the slack hypothesis, neither the commercial premium tax rate (t_C) nor the discount (D) demonstrate any impact on this dependent variable. State regulation of Blue Cross premiums has no effect on the loading, nor, judging from a regression not shown here, on the Blue Cross discount. Coefficients on the wage variable, and variables indicating whether financial data are combined for joint Blue Cross–Blue Shield plans, and whether Blue Cross sells medical–surgical insurance attain statistical significance in two out of four cases.

The share regression shows that Blue Cross premiums (P_B) have the anticipated negative effect on Blue Cross market share with an elasticity, evaluated at the means, of -0.60 . Substituting the estimated Blue Cross discount and loading equations [eqs. (1) and (2)] into the Blue Cross

²¹As the Blue Cross market share rises, the plan is probably in a stronger position to shed its ties with hospitals.

²²From Reimbursement Survey data, we estimate that the discount obtained by Medicare and Medicaid in 1979 was over twice the Blue Cross discount.

premium supply equation [eq. (3)], it is apparent, by comparing the coefficient on S_B with the inverse of the P_B coefficient from the demand equation, that the demand equation crosses the supply curve from above. With the demand curve steeper than the supply curve, the reduced form coefficients imply that any factor shifting demand for Blue Cross coverage outward will increase the Blue Cross market share. If the demand curve were flatter than the supply curve, outward shifts in demand would have the opposite, implausible effect on Blue Cross' share. The equilibrium of the estimated demand and supply curves is stable in a Marshallian sense. As specified, the supply curve is linear. In a more general specification, if the demand curve were flatter than the supply curve at the intersection of the two curves, they would presumably intersect again at some higher output with the rank order of slopes reversed. The latter intersection would yield the plausible response to an outward shift in the demand curve.

The commercial premium (P_C) unexpectedly has no effect on the Blue Cross market share. We have experimented with alternative specifications, such as splitting P_C into its components, and including the components as separate explanatory variables in the share (demand) equation, and the result is similar to table 2's. Possibly, our finding reflects measurement errors in P_C . This variable was derived from a multi-step approach described above.

However, an alternative explanation is at least as likely. There is generally competition between complete coverage offered by Blue Cross plans and partial coverage offered by commercial insurers. As the own price of Blue coverage increases, purchasers of insurance opt for the lesser 'quality' coverage provided by the commercials. A third possibility is that purchasers opt for health maintenance organizations when faced by a high own price for traditional Blue Cross insurance. Unfortunately, no measure of the price of HMO coverage is available for all Blue Cross plan areas. As an imperfect alternative, we included the HMO market share as an explanatory variable in a Blue Cross market share regression.²³ In a regression not shown, HMO market penetration has no impact on the Blue Cross share.

The remaining explanatory variables, urbanization and unionization have statistically significant impacts on Blue Cross market share. The demand curve for Blue hospital coverage shifts outward in urbanized areas and in those with high proportions of unionized workers. When Blue Shield competes with Blue Cross in the market for hospital insurance, not surprisingly, the Blue Cross share of this market is lower.

3.2. *Reduced form estimates*

Table 3 presents reduced form estimates obtained from table 2's three estimated structural equations and the two premium identities. We have

²³The HMO share variable excluded Blue Cross enrollees in HMOs.

Table 3
Reduced form estimates.

Exogenous variables	Endogenous variables				
	D	L_B	P_B	P_C	S_B
Constant	-0.228	-6.8	256.65	218.39	0.15
Medicare-Medicaid share	0.32	3.47	-65.34	0.00	0.069
Bed-population ratio	0.015	0.16	-3.09	0.00	0.003
Rate-setting over Blue Cross	0.11	1.18	-22.30	0.00	0.024
Rate-setting over commercials	-0.091	-0.99	18.63	0.00	-0.020
Blue Cross premium approval	0.000	-0.78	-0.81	0.00	0.001
Wage rate	-0.001	5.34	5.58	0.00	-0.006
Population	0.001	-0.40	-0.42	0.00	-0.000
Blue Cross and Blue Shield data combined	-0.002	10.79	11.28	0.00	-0.012
Plan processes Medicare claims	-0.001	5.13	5.36	0.00	-0.006
Blue Cross sells insurance for MD services	-0.001	6.39	6.69	0.00	-0.007
Fraction of persons in SMSAs	0.036	-4.95	-12.77	0.00	0.21
Fraction of employees in a union	0.13	-17.80	-45.95	0.00	0.74
Blue Shield sells insurance for hospital services	-0.033	4.51	11.63	0.00	-0.19
L_C	-0.000	0.002	0.006	1.02	-0.000

handled the non-linearities in the two identities by setting the premium tax rates and payments to hospitals per capita population at their observational means. We evaluate the total effects of these variables separately.

These are the major results from table 3. Including Blue Cross under a mandatory rate-setting program but excluding commercials raises the relative discount (by 11 percentage points), but the Blue market share only rises by 2.4 percentage points. This is an underestimate of the effect of a partial rate-setting program for the following reason. We treat per capita payments to hospitals (H) as exogenous, but several studies have found that mandatory prospective reimbursement reduces H .²⁴ Based on this evidence, an upper bound on the total effect of including Blue Cross under mandatory prospective reimbursement on the Blue Cross share is seven percentage points.

²⁴See, for example, Coelen and Sullivan (1981) and Sloan (1982) for a review of recent studies in this area.

Reflecting the result on the Blue Cross loading in table 2, premium regulation has a negligible influence on the Blue Cross premium; in table 3, the premium falls by less than a dollar per enrollee per year and share increases by only 0.1 percentage points. Judging from the estimated parameters, the Medicare-Medicaid share has a far greater influence, although this parameter is not significant at conventional levels. As this share increases, hospitals are more willing to grant a discount to Blue Cross. An increase in the government insurance market share of 10 percentage points raises the Blue Cross discount by three percentage points, lowers premium by \$6.53, and raises the Blue Cross share by 0.7 percentage points. If governments succeed in controlling the growth in beds, hospital discounts to Blue Cross plans will fall, the Blue Cross loading will fall slightly (as there is a very small efficiency loss in Blue operations when they receive a discount), but premiums will rise because the rise in claims expense due to the decline in the discount will far outdistance the decrease in Blue plan efficiency.

Although Medicare and Medicaid coverage affects the Blue Cross supply curve and hence the Blue Cross share indirectly, unionization has both direct and indirect effects on the share. Adding the indirect effect to the direct effect of 0.69 yields a total effect of 0.74. Thus, a 10 percentage point rise in non-agricultural employees unionized raises Blue Cross market share by 7.4 percentage points.

Table 4 shows total effects of premium taxes and per capita payments to hospitals on the endogenous variables. A premium tax differential has a trivial effect on Blue Cross market share; when t_B and t_C are both two percent

Table 4
Total effects of premium taxes and payments to hospitals per capita population.

Scenario	Predicted levels of				
	D_B	L_B	P_B	P_C	S_B
All variables at means	0.046	16.69	221.43	263.37	0.45
$t_B = 0$ $t_C = 4\%$ H at mean	0.046	19.01	223.05	268.11	0.44
$t_B = 2\%$ $t_C = 2\%$ H at mean	0.046	10.65	218.80	262.96	0.45
t_B at mean t_C at mean H above mean*	0.039	17.66	256.23	297.59	0.41

*At one standard deviation (17 percent) above mean.

the Blue Cross share is 0.45 and when there is no such tax on Blue Cross premiums and the tax on commercial insurer premiums is four percent, the share is 0.44. The reason for this result is that the increase in the Blue Cross loading in response to the tax changes more than offsets the effect on the Blue Cross premium due to the premium tax reduction. The effect on the loading is implausibly high. For this reason and in view of the underlying structural equation results discussed above, the small estimated change in market share in response to tax changes is more noteworthy. Raising H one standard deviation above its mean (17 percent) reduces the share from 45 to 41 percent. Accompanying the lower share is a lower discount and a higher loading as the plan moves up its downward-sloping average cost curve. This result suggests that it is in Blue Cross' self-interest to implement effective hospital cost containment policies, since high claims expense results in higher premiums and a substantial reduction in the quantity of Blue Cross insurance demanded.

4. Discussion and conclusions

There has been much debate about both the rationale for non-neutral treatment by government of profit-seeking versus non-profit insurers and about the magnitude of the net advantage conferred by governments on the non-profits. We find that premium tax advantages enjoyed by the Blues are not large on average; nor do they have an appreciable effect on premiums and market shares. Non-profits are exempt from corporate income taxes. Unfortunately, it is not possible to gauge the importance of this advantage to the Blues since commercial insurers have typically reported underwriting losses in recent years on their health insurance business.²⁵ This does not mean that health insurance was unprofitable, but assessing the marginal contribution of health insurance to profits of commercial insurers and hence to corporate income taxes would take us far afield. Similarly, attributing other state and local taxes to the commercials' health insurance business would be no simple affair, but, in any event, such taxes tend to be a small fraction of premium income.²⁶

The hospital discount does affect market share through its effect on the premium. The fact that governments have not intervened to eliminate this source of competitive advantage and in a few states have actually supported discounts through prospective payment programs in part reflects a policy judgment that the market share of the Blues is not anticompetitive. And, conversely, allowing the commercials to bargain collectively with hospitals

²⁵Carroll and Arnett (1981).

²⁶This estimate is based on corporation tax return data from U.S. Internal Revenue Service (1981). Greenspan and Vogel (1982) concluded that the role of premium taxes on market share has been declining over time.

would seem, judging from the actions (or inactions) of governments, to potentially reduce competition among insurers to an unacceptable degree. Any insurer may justify a discount if it costs hospitals less to deal with that insurer and/or its patients. Based on a review of the literature and their own work, Sloan and Becker (forthcoming) concluded that only trivial cost differences exist when appropriate cost-determining variables are held constant. Hence, this is not a rationale for granting discounts to Blue Cross plans.

Alternatively, exercise of monopsony power by an insurer may be one of several second-best methods for driving the price of hospital care toward a competitive level. For a variety of reasons, including the monopolistic structure of the hospital industry and nearly complete coverage of hospital care, this market can hardly be termed 'competitive' in its present form. Certainly, a more direct solution to overinsurance would be to remove tax subsidies which boost demand for such coverage.

Our results show that state programs regulating hospital rates have worked to the advantage of Blue Cross, especially when such programs do not also apply to the commercial insurers. For this reason, the commercials have lobbied to get under the same regulatory umbrella.²⁷ Such regulatory programs let the state be the monopsonist in the market for hospital care. Lumping all private insurers together would certainly not do much to foster innovative behavior on the part of insurers. An alternative would be to expect individual commercial insurers to respond to the Blues plans' discounts by negotiating on their own with individual hospitals for a more favorable price. Although no single commercial insurer has monopsony power over hospitals in an area as large as a state, some could have substantial bargaining power in local market areas or with individual hospitals. A very recent development of this sort is the preferred provider plan. Under such an arrangement, an insurer negotiates a favorable rate with a hospital or small group of hospitals. Consumers can then purchase health insurance at a favorable rate subject to the condition that they obtain their hospital care from the covered hospital(s).

Even though some of the state mandatory hospital rate-setting programs have clearly worked to the disadvantage of commercial insurers, they have not been as injurious to them as some of the statements by the commercials imply. An upper bound on the effect on the Blue Cross market share of covering Blue Cross under rate setting but excluding the commercials from such coverage is seven percentage points. To check on our results, we have correlated the growth in Blue Cross market share by plan between 1971 and 1979 with the 1971-79 change in relative discount. The simple correlation is +0.13. The correlation might have been higher if we had had a more precise measure of the 1971 discount.

²⁷See, for example, Health Insurance Association of America (1982).

The two types of insurers are subject to different kinds of insurance regulation. However, we have been able to detect no meaningful impact on either premiums or shares attributable to regulation, based on the test reported above and others involving regulation of commercial insurers not reported here.

Finally, the notion of administrative slack receives less emphasis in this study than in previous work by other economists. One study which found no scale economies in Blue claims processing coupled with the finding of scale economies for their commercial competitors concluded the Blues are X-inefficient on average.²⁸ Making an inference about X-inefficiency from empirical evidence for scale effects is troublesome in its own right. Also, with data for a more recent year and a different equation specification, we find strong evidence for Blue Cross scale economies. We have implemented a much more direct test for X-inefficiency which suggests that some of the competitive advantage is spent on slack. However, although somewhat interesting as an application of property rights theory, the amount of slack purchased is too small to interest policymakers involved in health care cost containment.

²⁸See Blair et al. (1975a, b). Our results on scale are more consistent with Kass and Pautler (1981).

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