Faculty Working Papers

THE EFFECTS OF PROVIDER CONTROL OF BLUE SHIELD PLANS: REGULATORY OPTIONS

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#645

College of Commerce and Business Administration
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Summary:

Most Blue Shield plans are characterized by two distinguishing features: regulatory tax advantages over commercial health insurers and/or local medical society control over plan reimbursement policies. Economists have speculated that either of these traits could be a source of monopoly power for Blue Shield. This paper describes, theoretically and empirically, the circumstances under which this monopoly power will raise physicians' fees. Given the competitive nature of the for-profit segment of the health insurance market, a Blue Shield plan could operate in several markets -- i.e., with/without a tax advantage and control by jurisdictional medical society(ies), or with/without a tax advantage and no control by jurisdictional medical society(ies). There is no a priori reason for policy concern over a plan operating without tax advantage or medical society control since the health insurance is, under those circumstances, competitive. The empirical findings of this paper indicate that only the plan with a tax advantage and medical society control induces significantly higher physicians' fees. The policy recommendation derived from this result is straightforward. Any rule specifying limited medical society affiliation with or control over the filial Blue Shield plan should be focused on plans maintaining a tax advantage over health insurers.

Acknowledgment:

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Research amassed within the past five years on Blue Cross-Blue Shield suggests that the nation's largest network of private health insurance plans reduces consumer welfare [2, 8, 9, 11, 12, 13, 15, 18, 28]. Frech (1979) in a recent paper, states that the basic conclusion of previous studies "is that the Blues, largely as a result of their special position in medicine, hold some market or monopoly power and that they use this power to benefit the providers of care and those operating the Blue Cross and Blue Shield plans, but at the expense of consumers in general" [11]. While Frech admits there are serious disagreements on many points, he finds "the overall picture painted by the critics of the Blues' power convincing" [11].

There is little disagreement that Blue Cross or Blue Shield, because of regulatory advantages and/or close links with organized provider groups, possess potential market power which could result in supra-competitive hospital charges or physicians' fees. However, theoretical and empirical research on the "Blues" is inadequate because plans are treated as either 1) homogeneous entities, or 2) insufficiently differentiated. This is unfortunate because certain plan characteristics determine each plan's potential market power, and hence, each plan's conduct. It is conceptually and empirically inappropriate to treat these plans as similar institutions when their effects on hospital costs or physicians' fees vary according to certain distinguishing characteristics.

Essentially, Blue Cross and Blue Shield plans contain two distinguishing features: regulatory tax advantages, and provider control over the level of plan reimbursement made to hospitals and doctors. Not surprisingly, recommendations to alter plan decision making structure or change the regulatory environment in which the plans operate have focused

on income augmenting features of these charcteristics. Unfortunately, previous research has provided a basis for implementing policy based on one characteristic without considering or evaluating the effect of the other. For instance, Frech and Ginsberg conclude that "...there is evidence that regulatory advantages of Blue Cross plans are used to raise market share and also to allow administrative costs to rise." [15, p. 234]. Conversely, a recent FTC report pertaining to physician control of Blue Shield plans considers only the effects physician domination of Blue Shield plans have on fees and empirically ignores the interface between such control in the regulatory environment within which the plans operate [19]. This is unfortunate because in the competitive health insurance market, i.e., one without favorable Blue Shield regulations, such control would have little normative economic significance. Hence, use of antitrust policy to curb physician control in plans may increase welfare only in those plans which operate in non-competitive health insurance markets, i.e., plans with a tax advantage. Alternatively, adopting new state legislation which revokes the "Blues" tax advantage will be ineffective if provider affiliation with the plan is the primary determinant of higher medical costs. This paper provides a theoretical framework for evaluating the effects of Blue Shield plans, and empirically determines under what conditions regulatory treatment of Blue Shield or medical society control over the plan leads to higher physician fees.

The paper is organized into three sections. First, the origins of Blue Shield monopoly power are discussed in some institutional detail. Subsequently, a stylized model of the health insurance market is presented analytically depicting the effects of Blue Shield monopoly power. The subsequent section empirically ascertains which, if any, of these

sources of market power are responsible for affecting surgical charges. The paper concludes with a discussion of the econometric results as they pertain to future efforts by antitrust enforcement (and other) agencies to diffuse medical society control over Blue Shield plans.

Section II: A Discussion of Blue Shield Monopoly Power and A Stylized Model of the Health Insurance Market

Most Blue Shield plans were formed during the 1940's and 1950's by county and state medical societies. Plans typically secured passage of enabling legislation from respective states which sometimes stipulated organized medical or physician control over the plan, and usually exempted plans (or subjected them to reduced rates) from payment of state income and premium taxes. Additionally, almost all Blue Shield plans are exempt from payment of state and federal income taxes, and in certain states, incur decreased local and/or state property tax liability. State premium taxes are generally assessed on an ad valorem basis, the tax rate ranging from 2-4% of premium income depending upon the state.

The early Blue Shield plans obtained much of their support from the American Medical Association which encouraged the formation of medical society-sponsored, nonprofit health insurance plans. Because of their obvious links with organized medicine, speculation has flourished that medical society control of Blue Shield plans could result in supra-competitive fees in the physicians' services market.[1] However, the potential for parental medical societies to exert monopolistic influence over filial plans has been mitigated by certain developments.

Growth in the size of plans rendered the interface between plans, subscribers and the providers more complex. Subscribers of physician

or medical society controlled plans were alienated by high premiums they felt resulted from high doctor fees. Stringent reimbursement methods, on the other hand, alienated the providers and lead to a loss of support from organized medicine; an aspect of Blue Shield that differs from commercial insurers. These conflicts led to growth in the participation of the public in plan decision making while growth in plan size led to demands for larger and more specialized administrative units. The result has been a decrease in the influence over plan policies and decision making by organized medicine and an increasing influence by plan administrators and subscribers, each of whom have differing objectives.

Current evidence suggests considerable variation in the extent of medical society control over individual plans. In 1977, eleven plans operated without the sanction of the jurisdictional medical society(ies), and in 23 of the 58 plans comprising the data base used in this study, medical societies played no formal role in the selection of members to the plan's board of directors.[2]

The growth in plan membership and consequent rise in administrator responsibility/status creates an interesting property rights conflict between administrators and sponsoring medical societies. Since plans are nonprofit organizations there is no direct transfer of wealth to each of these groups via stock dividends, or other forms of profit sharing. Therefore, the only way each group can financially benefit from controlling plan decision making is by competing for and absorbing plan premiums.

Medical societies acting on behalf of various physicians who receive reimbursement from the plan would attempt to capture plan revenues by

evaluating and expanding plan fee schedules. The most common strategy employed to assure this result is preserving medical society control of the plan Board of Directors. Control of plan boards could be achieved by stipulating the board members be approved by the jurisdictional medical society. Those plan boards being more responsive to medical society demands than where no medical society control exist could legislate more liberal plan reimbursement by (1) stipulating more frequent updating of plan fee schedules, (2) adopting lenient rules for the determination of usual customary and reasonable fees, and (3) broadening the range of covered services typically delivered by physicians. In other words the immediate impact of medical society control over plan decision making is on the rules used to determine the level of plan reimbursement. We do not, however, have accurate data reflecting the various reimbursement features on every plan. However, it is reasonable to argue that the separate criteria used by plans to determine payment levels is less important than the existence of medical society control, since such control will result in the adoption of a set of reimbursement policies and criteria which maximizes payment to physicians. Obviously strategies that increase plan reimbursements raise the demand for and price of physicians services.

Alternatively, plan administrators could absorb revenues through administrative slack—opting for more staff, higher salaries, and more comfortable surroundings. This would reduce the amount of potential insurance coverage offered by the plan.

If the health insurance market were competitive, administrators or medical societies (acting as the bargaining agent for member physicians)

could not succeed in capturing rents. A competitive insurance market would produce the optimal mix of insurance coverage and administrative costs; any deviation from that combination by a Blue Shield plan would place the plan at a competitive disadvantage vis-a-vis another insurer. Thus, the property rights conflict between administrators and medical societies has positive economic significance only when the health insurance market contains non-competitive elements. Regulatory tax advantages given to Blue Shield plans and medical society efforts to force other insurers to duplicate a Blue Shield plan's higher level of coverage represent the primary non-competitive elements.[3]

The premium tax exemption granted to Blue Shield plans gives them a competitive advantage vis-a-vis for-profit commercial health insurers, not exempt from payment of those taxes. In general, the premium tax advantage held over foreign commercial underwriters (those with home offices outside the taxing jurisdiction) exceeds the advantage maintained over domestic companies (those with home offices in the taxing state). For instance, in 1976, the mean administrative expense (net of premium taxes) as a percentage of premium income for Blue Shield plans not merged with Blue Cross was 11.6% [9]. Given a mean Blue Shield tax advantage over foreign commercial underwriters of 1.76%, a typical non-merged plan has a 13% cost advantage over for-profit insurers.

The tax advantage creates a subsidy which would be used by plans in several ways. First, if the subsidy were used efficiently, the plan would increase insurance coverage and force the for-profit companies to exit from the health insurance market. However, the empirical observation that commercial firms continue to enter and operate in the market

has prompted researchers to question whether the Blues are efficiently using the tax advantage. The property rights issue discussed above suggests that either administrator or medical society-controlled plans could exhaust the subsidy through administrative slack or overinsurance. In fact, the presence of administrator or medical society control over a plan should, in theory, dictate how the subsidy is used to the pecuniary gain of either party. If that component of the premium constituting the subsidy were internalized by either group, commercial companies could remain in the market.

A medical society-controlled Blue Shield plan could produce rents for area physicians if it possessed market power independent of the tax advantage.[4] For instance a plan could force the commercial insurers to duplicate its coverage levels by sanctioning a physician boycott of commercially insured patients. This situation actually transpired in Oregon in the early 1940's.[5] Commercial insurers were forced to follow Oregon Blue Shield's reimbursement policies after the Oregon State Medical Association sanctioned a physician boycott of commercially insured policyholders. While boycott may be an effective tactic for tempering practices of aggressive commercial underwriters, it constitutes a per se violation of federal (and state) antitrust laws. However, implicit threats of boycott, as well as commercial company recognition of Blue Shield as the "market leader" could achieve the same desired result.

The above discussion indicates that Blue Shield plans fall into four categories, 1) no tax advantage, non-medical society-controlled, 2) tax advantage, non-medical society-controlled, 3) no tax advantage, medical society-controlled, and 4) tax advantage, medical society-

controlled. The below model theoretically illustrates the possible effects which these different plans could have on the quantity of health insurance coverage, and hence, the demand for and price of physicians' services.

A Stylized Model of the Health Insurance Market

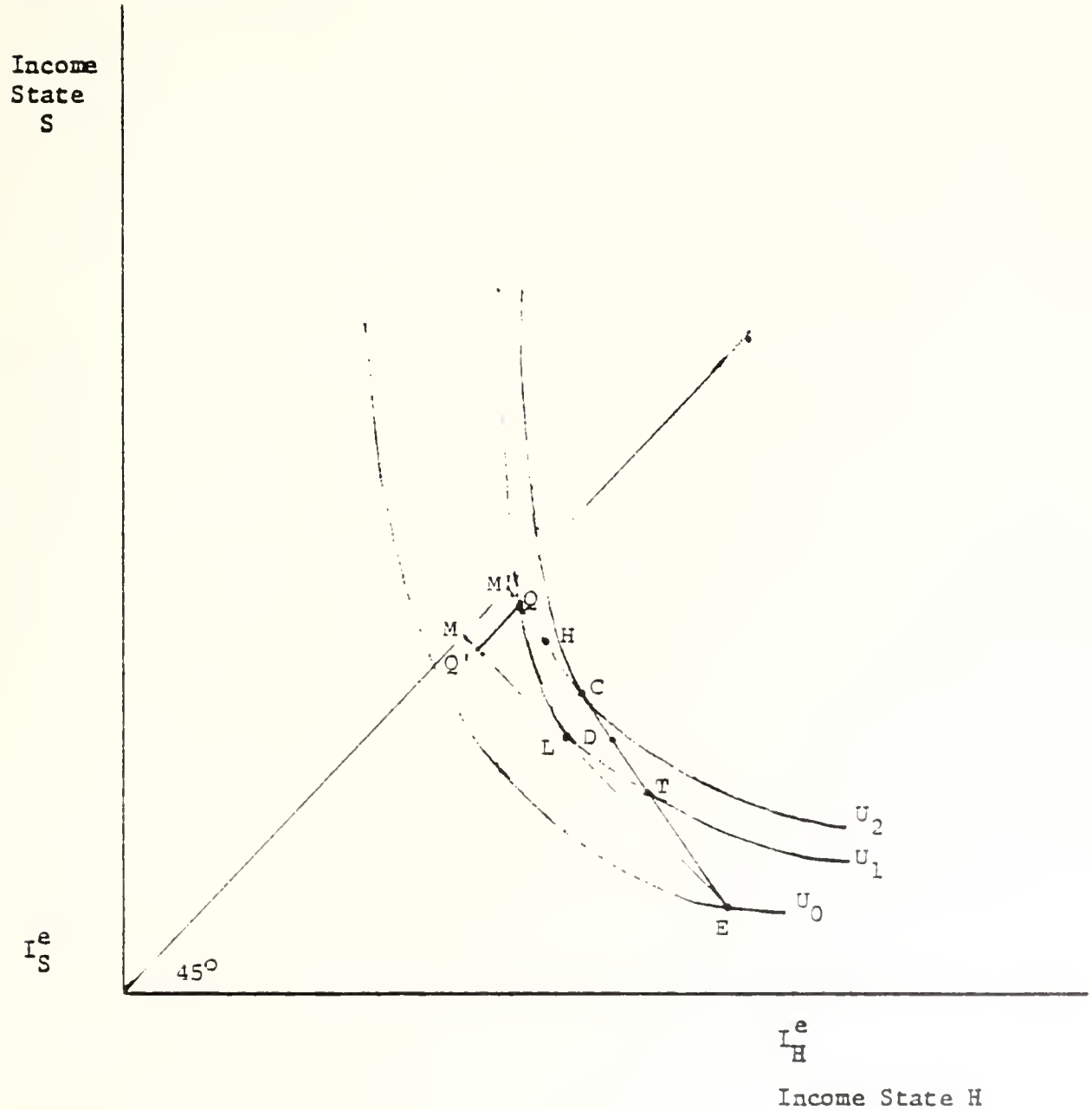
The foundation for the model comes from Ehrlich and Becker [5]. It is separated into three parts. First, the competitive equilibrium position of an insurance market without Blue Shield regulatory tax advantages is described. Next, the effect of the premium tax exemptions is incorporated into the model, and the change in the industry competitive equilibrium is analyzed. Finally, medical society efforts to increase insurance coverage in plans with and without a tax advantage are discussed.

The model assumes that individuals maximize expected utility of income over two states of nature, health and sickness. Income in the sick state (I_S) can be augmented by the purchase of health insurance. Purchases of health insurance require payment of a positive premium which reduces the level of income in the health state (I_H). Individuals face probabilities of health and sickness of p and 1-p, respectively.[6] Additionally, they exhibit global risk aversion (utility functions are strictly concave) while insurers are assumed to be risk neutral. Consumer preferences are represented by a Von Neumann-Morgenstern expected utility function.

Prior to the purchase of insurance, individuals are endowed with a particular level of wealth in each state. In Figure I, this is shown as point E, with coordinates I_H^e and I_S^e. Endowment point E lies on

FIGURE I

A GRAPHICAL ANALYSIS OF THE HEALTH INSURANCE MARKET



expected utility indifference curve U^0. The locus of all points denoting equal incomes in states H and S is given by the 45° line. The vertical distance between E and the 45° line gives the level of medical expenditures if state S occurs. Any purchase of insurance is assumed to move individuals "northwest" toward the 45° line.

Consider an underwriter willing to supply insurance at odds p and 1-p. Expected underwriting profit, $E(\pi_U)$, for the insurer is given by:

$$(1) \qquad E(\pi_U) = p(I_H^e - I_H) + (1-p)(I_S^e - I_S)\alpha.$$

where, $I_H^e - I_H$, represents premiums (PR) paid, $I_S^e - I_S$ denotes reimbursements (R), or claims payment in state S, and α is the loading charge, such that $1 < \alpha < \infty$.[7] Assuming a competitive insurance market with free entry, expected economic profits can be set to zero and solved for $I_H^e - I_H$ to obtain:

$$(2) \qquad I_H^e - I_H = -P(I_S^e - I_S)\alpha.$$

where $P = (1-p)/p$, and $P\alpha$ gives the market price of insurance, or, the rate which income in the health state can be exchanged for income in the sick state.

Consumers are assumed to maximize expected utility of income over states S and H. Expected utility is expressed as:

$$(3) \qquad E(U) = p(U_H) + (1-p)(U_S).$$

Maximizing (3) subject to (2) (the zero profit condition for the insurer) gives the following Lagrangian expression:

$$(4) \qquad L = pU(I_H) + (1-p)U(I_S) + \lambda\{I_H^e - I_H + P(I_S^e - I_S)\alpha\}$$

Differentiating (4) with respect to I_H, I_S, and λ gives the following first order conditions for a maximum:

$$(5) \qquad L_{I_H} = pU'(I_H) - \lambda = 0.$$

$$(6) \qquad L_{I_S} = (1-p)U'(I_S) - \lambda\alpha P = 0.$$

$$(7) \qquad L_{\lambda} = I_H^e - I_H + P(I_S^e - I_S)\alpha = 0.$$

Dividing (5) by (6) yields:

$$(8) \qquad \frac{pU'(I_H)}{(1-p)U'(I_S)} = \frac{1}{\alpha P} = \frac{p}{\alpha(1-p)}$$

Condition (8) states that consumers will maximize expected utility where the ratio of the expected marginal utilities of income in states H and S, equals the reciprocal of the market price of insurance. Since, α must be greater than one (a positive markup), the marginal utility of income in state S will exceed the marginal utility of income in state H. This implies that less than complete coverage will be purchased. The optimal policy in a competitive insurance market is depicted as point L in Figure 1.[8] The horizontal distance between E and L measures premiums paid, and the vertical distance captures benefits (to the policyholder) or reimbursement (by the underwriter).

Blue Shield Tax Advantages

The first part of the model assumed that all underwriters offered insurance at identical prices. However, enabling legislation in most states excludes Blue Shield (and Blue Cross) from payment of state and local premium taxes. In theory, the exemptions will permit Blue Shield

to realize a cost advantage in the sale of health insurance and force the commercial companies to exit from the industry.

Functionally, the effect of the tax advantage is to lower α for Blue Shield relative to the commercial underwriters. Graphically, this rotates (clockwise) the zero profit constraint for Blue Shield around point E in Figure 1. The extent of the rotation depends on the size of Blue Shield's tax advantage. Iso-profit line EM' denotes the set of break-even policies for Blue Shield given a certain level of tax advantage. Blue Shield can offer policy D, identical in coverage to policy L, for a lower premium. Alternatively, higher coverage policy H can be sold for the same premium as L. Any policy offered to the left of T along EM', makes consumers better off than policy L. Since T provides a lower level of coverage than L, expected utility will necessarily increase if the tax advantage is used by Blue Shield to raise coverage. This can be determined by finding the sign of:[9]

$$(9) \qquad \frac{dI_S}{d\alpha} = \frac{-\lambda P + -pU'(I_H)p(I_S^e - I_S)\alpha P}{-(1-p)U''(I_S) - pU''(I_H)(\alpha P)^2} < 0.$$

Appendix I shows the sign of (9) to be unambiguously negative. Hence, a lower α results in the purchase of more insurance.[10] Blue Shield's policy, given the tax advantage, is shown as point C along EM'. Policy C places consumers on a higher expected utility indifference curve than policy L. Therefore, by efficiently utilizing its tax advantage to raise insurance coverage, Blue Shield can force the exit of the commercial health underwriters.

As stated above, the commercial companies may remain in the market if administrators or physicians who control Blue Shield plans use the

subsidy in a manner that does not maximize consumer welfare, i.e., point C. To see how this could happen, return to Figure I. If the subsidy is captured by administrators, Blue Shield's cost advantage dissipates and zero profit constraint EM' would shift down to EM; the tax advantage would produce no change in insurance coverage, as the subsidy is absorbed by adminstrative slack (higher α). Alternatively, medical society-controlled plans could exhaust the subsidy by oversupplying insurance. This would result in the offer, for instance, of policy Q along EM'.[11] Policy Q provides such relatively complete insurance that individuals are indifferent between it and policy L, offered by the for-profit companies. Hence, medical society-controlled plans with a tax advantage induce the sale of too much insurance (relative to policy C).

Medical society-controlled plans without a tax advantage, could attempt to offer policy Q', identical in benefit to Q. However, in a competitive insurance market, with perfect information, consumers would choose to purchase policy L, offered by the commercial companies. A medical society-dominated plan offering Q would be placed at a competitive disadvantage unless it possessed market power which could be exercised against the commercial insurers.

The model describes four possible settings in which Blue Shield plans operate. In three of those settings, it is conceivable that Blue Shield could raise the demand for and price of physicians' services. A plan without a tax advantage or medical society control, would operate in a competitive health insurance market. A priori, there is no reason to expect such a plan to deviate from the competitive combination of insurance coverage and administrative costs. A plan with a

tax advantage could use the subsidy efficiently to increase insurance coverage. However, efficient use of the subsidy will be less likely in administrator and medical society-controlled plans. The former will exhaust the subsidy through administrative slack resulting in coverage less than or equal to the competitive level. Inefficient administrator-controlled plans will not, therefore, have an elevating effect on physicians' fees. A medical society-controlled plan with a tax advantage would absorb the subsidy generated by the tax advantage through overinsurance. Lastly, a medical society-controlled plan without a tax advantage, could succeed as a price or "quality" leader by inducing the commercial firms to duplicate its higher level of coverage. Medical society control over Blue Shield in these last three markets, could result in supra-competitive physicians' fees. The ensuing section develops and performs the statistical test necessary to determine whether, ceteris paribus, higher surgical fees exist in markets where 1) the Blue Shield plan maintains a tax advantage over commercial insurers, 2) the Blue Shield plan is medical society-controlled and possesses a tax advantage, and 3) the Blue Shield plan is medical society-controlled but maintains no tax advantage over commercial underwriters.

Section III: Estimation and Results

A surgical fee equation utilizing pooled cross section-time series data was used to estimate the effect of Blue Shield monopoly power on unit fees (conversion factors) for surgical procedures across Blue Shield market areas. The dependent variable, RCF, is the mean deflated conversion factor for surgical services in a Blue Shield market area. Nominal

mean conversion factors used to compute RCF come from the Health Insurance Association of America (HIAA) Prevailing Health Care Charges System (PHCS). The conversion factors are derived by the HIAA using the 1964 California Relative Value Study. Three PHCS series, representing 1974, 1975, and 1976, were used in the econometric work.

Each PHCS contains surgical charges submitted by practitioners treating commercially insured policyholders with major medical coverage. Fees are collected for approximately 250 three digit zip code areas around the country. The zip code areas are aggregated (where appropriate) by the HIAA to determine prevailing charge areas and physicians' customary fees. These fees are assumed to be representative of market prices for physicians' services. If price discrimination on the basis of insurance coverage were still a widespread pricing phenomenon, use of HIAA conversion factors as proxies for market fees would not be justified. However, Sloan and Feldman (1977) remark that point-of-delivery price discrimination is no longer a widespread pricing strategy among doctors [27].

Fees submitted for individual procedures were not used as the dependent variable because the model develoeped in section II yields no insight into which surgical fees should be affected by Blue Shield monopoly power. Mean conversion factors were calculated for each Blue Shield market area and deflated by an area price index, using the method described by Sloan (1976).[12]

The regressors used in the surgical fee equation are divided into two sets. The first group of independent variables reflect Blue Shield tax advantages and medical society control. The second set is included

to improve the efficiency of the estimation since regressors in this set account for conditions in the physicians' services market external to the existence of Blue Shield market power. A priori, they are expected to exhibit little or no relationship to the "monopoly power" variables. However, exclusion of these regressors would have raised the error variance on the coefficient estimates of the Blue Shield variables. This causes the null hypothesis of no linear relationship between the Blue Shield monopoly power variables and RCF to be accepted with greater frequency.[13]

Three Blue Shield related variables were used in the surgical fee equation. The first two measure the extent of medical society control over the Blue Shield plan. Medical societies can dictate plan reimbursement policies by controlling the selection of the plan's decision making body--the board of directors. Bylaws in each plan generally specify how board representatives are chosen. Typically, they are composed of doctors, lay representatives or subscribers, and hospital officials from the plan area. In most plans, any change in the method and level of physician reimbursement must be legislated or approved by the board. TOTMSCON is a binary variable, equaling one if the jurisdictional medical society(ies) either 1) elects, nominates, or approves physician and public members to the plan board of directors or 2) has veto power over any board approved change in the level of physician reimbursement. MSCONDRB is also a dummy variable assigned a value of one when the medical society controls the appointment of only the M.D. board members. Because it is impossible to know a priori which of these measures reflects the true or relevant extent of medical society control

over reimbursement decisions, each of these regressors was used in the estimation.

DIFTXF, DIFTXD, DUMTXF, and DUMTXD, are all included to measure Blue Shield's premium tax advantage over commercial health insurers. DIFTXF and DIFTXD are continuous, while DUMTXF and DUMTXD are binary variables. DIFTXF is the difference between the premium tax rate assessed foreign commercial insurers and the rate applied to Blue Shield. DIFTXD is the difference between the domestic commercial health underwriter premium tax rate and the statutory rate levied on Blue Shield plans. DUMTXF and DUMTXD are dummy variables equaling one when the local Blue Shield plan maintains a tax advantage over foreign-commercial, and domestic-for-profit underwriters, respectively. Each tax advantage variable appears separately as a regressor, and is interacted with the relevant measure of medical society control over the plan.

Four standardizing variables are used to account for differences in surgical fees across plans not attributable to differences in Blue Shield market power. INS is the percentage of the Blue Shield market area population under age 65 with medical-surgical or major medical coverage. Positive increases in INS should raise the demand for and price of surgical services. POP65 gives the percentage of the population in the plan area over age 65. This variable reflects the higher demand by the elderly for surgical services, and also the level of Medicare Part B coverage in a Blue Shield area. While the aged have greater demands for physicians' services because of a higher incidence of illness, the level of coverage under Medicare Part B is generally inferior to private underwriter medical-surgical policies such as UCR

insurance. The former influence would be expected to increase surgical fees while the latter effect would reduce RCF, ceteris paribus. A priori, it is impossible to predict the directional relationship between POP65 and RCF. SURPOP gives the surgeon-population ratio in each Blue Shield market area. In previous studies, the physician-population ratio has been used as a proxy for the relative supply of doctors, a "shift" parameter in the physicians' demand curve, and a measure of consumer ignorance in the physicians' services market. Without reviewing the rationale for including this variable as a regressor in earlier research, SURPOP is utilized in this study to pick up any or all of the above mentioned "market" effects. SECT is defined as wages paid to clerical help in each Blue Shield market area. This variable accounts for differences in surgeons' costs of maintaining office practices in Blue Shield market areas. Predicted values for SECT are generated from a regression using Bureau of Labor Statistics Area Wage Surveys.[14] Values for each SECT observation are deflated by the area price index described above.

The fee equation can be written as:

$$(10) \qquad RCF = B_0 + B_1 DIFTXF + B_2 DIFTXF * MSCONDRB + B_3 MSCONDRB + B_4 INS + B_5 POP65 + B_6 SURPOP + B_7 SECT + E_i$$

where, B_0 is the intercept and E_i is the population disturbance term. The coefficient of DIFTXF (or the relevant tax advantage measure) measures the effect on deflated conversion factors of the tax advantage in plans without medical society control. B_3 reflects the effect of no-tax advantage-medical society-controlled plans on fees. B_2 measures

the marginal impact on fees attributable to medical society-controlled plans with a tax advantage. The sum of B_2 and B_3 indicates the overall effect of medical society control over Blue Shield in plans with a tax advantage.[15]

Equation (10) was estimated using three years of pooled data. A covariance model, as well as ordinary least squares (OLS) estimation were used initially to determine whether the intercept term varied across temporal and spatial observations. For the different tax advantage measures, and the two proxies of medical society control over the plan, the F-statistic calculated to determine whether pooling and OLS was appropriate was significant at the 1% level or better. Hence, OLS could not be used. The error components estimation technique specified by Fuller and Battese (1974) was utilized [11]. The Fuller-Battese method requires the estimation of four least squares equations. The first three are used to obtain weights to reflect the temporal, spatial, and random components of the error variance. The weights are subsequently used in the fourth equation to obtain generalized least squares (GLS) estimates of the coefficients. Since R^2 and F statistics are of dubious value in GLS estimation, they are not reported [3, 17]. Mean square error, another measure of goodness-of-fit, is reported for each equation.

Table I shows that the effect of the tax advantage on fees in non-medical society-controlled plans is positive in only two of the eight reported equations. In four of these (10b, 10d, 10f, 10h) non-medical society-controlled tax advantage plans have a negative but insignificant impact on fees. In estimated equation 10b, a plan with a mean premium

TABLE I

Summary of Results
Surgical Fee Equation
Dependent Variable is Real Commission Factor (RCF)

Independent Variable	10a	10b	10c	10d	10e	10f	10g	10h
Intercept	4.673 (4.133)	5.048 (4.633)	4.951 (3.740)	5.041 (4.667)	4.808 (4.876)	5.153 (5.441)	5.082 (4.304)	5.131 (5.442)
DIFTXF	.075 (.439)				.073 (.444)			
DIFTXD		-.197 (-1.373)				-.197 (-1.475)		
DUMTXF			-.135 (-.172)				-.144 (-.192)	
DUMTXD				-.269 (-1.413)				-.257 (-1.480)
TOTMSCON* DIFTXF	-.118 (-.571)							
TOTMSCON* DIFTXD		.153 (.889)						
TOTMSCON* DUMTXF			.130 (.158)					
TOTMSCON* DUMTXD				.166 (.553)				
MSCONDRB* DIFTXF					-.115 (-.611)			
MSCONDRB* DIFTXD						.158 (1.028)		
MSCONDRB* DUMTXF							.144 (.187)	
MSCONDRB* DUMTXD								.203 (.860)
TOTMSCON	.537 (1.237)	.204 (.718)	.203 (.250)	.231 (.819)				
MSCONDRB					.535 (1.379)	.200 (1.029)	.194 (1.039)	.218 (.908)
INS	.219 (.973)	.209 (.947)	.217 (.946)	.204 (.925)	.183 (1.023)	.180 (1.029)	.187 (1.039)	.181 (1.03)
POP65	-.076 (-1.290)	-.075 (-1.30)	-.077 (-1.29)	-.079 (-1.386)	-.074 (-1.616)	-.072 (-1.591)	-.074 (-1.612)	-.075 (-1.67)
SURPOP	-.001 (-1.233)	-.001 (-1.239)	-.001 (-1.265)	-.001 (-1.251)	-.001 (-1.299)	-.001 (-1.307)	-.001 (-1.328)	-.001 (-1.33)
SECT	.963 (5.240)	.948 (5.194)	.962 (5.221)	.956 (5.254)	.934 (5.826)	.921 (5.767)	.933 (5.805)	.926 (5.803)
M.S.E.	.07	.07	.07	.07	.06	.06	.06	.06
D.F.	118	118	118	118	163	163	163	163

tax advantage (.998 percent) over domestic for-profit insurers, lowers unit conversion factors by approximately $.20 (.998 X -.197). The insignificant effect of the tax advantage on fees in these plans suggests administrative slack or inefficiency. Administrators in these plans absorb the tax subsidy through inefficiency, reducing the potential amount of coverage the plan can offer.

However, the result is not inconsistent with the possibility that administrator controlled plans use the tax advantage efficiently to provide insufficient coverage. For instance, in Figure 1, T reflects a level of coverage consistent with such a policy. Indeed, the negative coefficient on the tax variable in equations 10B-10D and 10F-10H are consistent with administrators using the tax advantage efficiently to lower coverage. At a minimum, however, the coefficients of tax variables imply that administrators do not use the tax advantage to increase insurance coverage which would result in an increase in physician fees.

The total effect of medical society-controlled plans given a Blue Shield premium tax advantage is represented by the sum of B_2 and B_3 ($B_2 + B_3\overline{TAX}$ in plans where the tax advantage is measured continuously). Table II reports these coefficient sums and t statistics for each of the eight reported equations. The impact of positive-tax advantage-medical society-controlled plans on RCF ranges from $.32 to $.42. Given a mean real conversion factor of $8.27 in these plans, medical society control over Blue Shield raises unit fees, on average, between 4 and 5%. For all the equations, this positive impact on fees is significant at the 10% level or better.

However, the marginal effect of medical society-controlled plans with a tax advantage on RCF is not significantly greater than the effect

TABLE II

The Effect of Medical Society Controlled Blue Shield Plans on RCF in Plans Maintaining a Tax Advanage Over Commercial Health Insurers

Equation	10a[a]	10b[b]	10c	10d	10e[c]	10f[d]	10g	10h
$B_2 + B_3$	.32	.35	.33	.39	.33	.36	.33	.42
"t"	1.84**	1.75**	1.47*	1.90**	1.90**	1.80**	1.65**	2.10***
Std. Err.	.173	.200	.224	.265	.173	.200	.200	.200

a The mean tax advantage maintained over foreign commercial insurers is 1.782 percent.

b The mean tax advantage maintained over domestic commercial insurers is .998 percent.

c The mean tax advantage maintained over foreign commercial insurers is 1.769 percent.

d The mean tax advantage maintained over domestic commercial insurers is .998 percent.

* Significant at the .10 level (one tailed test).

** Significant at the .05 level (one tailed test).

*** Significant at the .025 level (one tailed test).

on RCF of medical society-controlled plans without a tax advantage. Thus a policy aimed solely at the elimination of "doctor control" would accomplish little by way of providing for more efficient insurance in those plans without a tax advantage. The coefficient on the interaction term is never statistically significant at conventional levels. Recall, it is the combined effects of taxes and doctor control that is positive and statistically significant. Six of the eight reported equations show positive interaction term coefficients. The two equations where the interaction coefficient is negative measure the tax advantage as the difference between the premium tax rate levied on foreign commercial underwriters and the local Blue Shield plan. The negative sign on the interaction coefficient in these equations is not surprising since plans maintaining a tax advantage over foreign companies are not necessarily given preferential treatment over domestic insurers. However, the converse is always true. Thus, a positive tax advantage over foreign commercial insurers is less comprehensive and provides a smaller possible subsidy to be absorbed by physicians or administrators. As a result, the coefficients of B_1 and B_2 are less likely to be significantly different from zero in equations where a tax advantage exists over foreign underwriters.

Turning to the standardizing variables, the coefficient of INS is, as expected, positive. However, it is never statistically significant. A 1% rise in the percentage of a Blue Shield market area's population with either medical-surgical or major medical coverage raises RCF by approximately $.02, ceteris paribus.

POP65 generally impacts negatively on RCF. A 1% rise in the percentage of the market area's population over age 65 lowers real conversion factors from between $.07 and $.08, depending on the equation.

A rise in the surgeon population ratio of 10% lowers RCF by only $.00001. The coefficient of SURPOP is never statistically different from zero at conventional significance levels. SECT shows a strong positive relationship with RCF. A $1.00 increase in real wages paid to physicians' clerical assistants raises RCF by $.90 or more in all the estimated equations. The effect is always significant at the .001 level, or better.

Conclusion

Our results provide interesting rationale for adopting certain public policy in the health insurance industry. The insignificant effect of no tax advantage medical society control plans on fees suggests that the deleterious effects of physician (and administrator) control over Blue Shield could be eliminated if the tax advantage were abolished. Absent Blue Shield tax advantages, the results imply that the health insurance market is sufficiently competitive that medical society control over individual plans does not lead to higher physician fees. Hence, removal of the tax advantage is, as other researchers have noted, the best policy option. However, the probability of states rescinding en mass, Blue Shield tax advantages is not promising. The cost of executing such policy on a state by state basis appear to be quite high. Barring revision of state enabling statutes to eliminate the tax advantage, a second best policy for reform must be adopted.

The results imply that concern by enforcement agencies over the extent of medical society control or affiliation with filial Blue Shield plans is justified only when the plans maintain a positive tax advantage over commercial health insurers. Hence, using public policy to promulgate a rule omitting medical society control over Blue Shield is necessary in only a subset of plans. For the moment, implementation of this rule in the nine plans without a tax advantage over domestic health underwriters or the six plans without an advantage over foreign health insurance carriers is premature, and certainly not justifiable on the basis of economic theory.

These findings are consistent with other work performed by Eisenstadt and Kennedy indicating that physician-controlled Blue Shield plans with a premium tax advantage over for-profit insurers have lower administrative costs (net of premium taxes) than non-controlled plans [9]. By forcing administrators to be efficient, physicians will internalize the subsidy generated by the tax advantage. Functionally, this results in an increase in the level of plan reimbursement (insurance coverage). Consequentially, physicians' fees will rise.

Medical society-dominated plans without a tax advantage could have a positive effect on market fees only if commercial companies were compelled to duplicate the plans' coverage level. The relationship between medical society control over these plans and fee levels is likely to be more tenuous, however, than for plans maintaining a tax advantage. First, only overt acts (like boycott) would appear to guarantee submission of the for-profit segment of the market. Second, the ease of entry into the commercial tier of the health insurance market would suggest

that a new entrant could easily make consumers better off by reducing coverage back to the competitive level. Whatever monopoly rents could be earned by physicians who are members or beneficiaries of aggressive medical societies would be competed away through the de novo entry of for-profit companies. Our results indicate that medical society control over Blue Shield plans not possessing a tax advantage is less likely to systematically raise surgical fees.

Non-medical society-controlled plans, with a tax advantage most likely use the subsidy to increase administrative slack. No increase in real insurance coverage and physicians' fees results. Of course, there is a social cost attached to raising rents to administrators in these markets. However, public policy other than application of the federal antitrust laws is necessary for eliminating this source of inefficiency. Barring any immediate revision in state laws governing non-profit health insurers, however, antitrust policy is likely to have no effect on prices in those plans where no tax advantage exists and disappointing results in plans where tax advantages exist due to the possible shift of the benefits derived from the tax advantage from physicians (in medical society controlled plans) to plan administrators; and hence, resulting in no effect to consumers.

Footnotes

[1]The first significant documentation of Blue Shield comes from Reed who hypothesizes that physicians could use Blue Shield plans as vehicles for raising their incomes [13]. Donebedian contemplates the possibility that "when implementation of the payment system is left in the hands of an agency such as Blue Shield, that is controlled by physicians and responsible to their wants, policy and regulations will be interpreted in a manner most likely to aid physicians in the quest for higher prices [4].

[2]Data referring to medical society control or affiliation with the plan comes from the Blue Shield Renewal of Membership Applications.

[3]The commercial segment of the health insurance market is unconcentrated, and conditions of free entry are assumed by most researchers. In 1976, approximately 800 for-profit or mutual companies operated nationwide, while 70 Blue Cross and 69 Blue Shield plans were situated in the continental United States and Hawaii. For data on individual commercial health insurers see [1].

[4]We have dismissed the possibility that administrators in plans without tax advantages possess market power. It is assumed that the market for managers is competitive.

[5]For a chronology and analysis of the Oregon situation see [16]. For a broader statement of this situation see [18].

[6]The assumption eliminates the possibility of moral hazard in the health insurance market. Conditions of moral hazard exist if the probabilities of S and H depend on the quantity of insurance purchased. Exclusion of moral hazard in insurance markets does not affect the analysis, except, that with moral hazard, the equilibrium quantity of coverage purchased is less than complete. For models of insurance markets with moral hazard see [14, 20].

[7]The loading charge in this model constitutes all costs in excess of the actuarial portion of the premium. An α equal to 1.2 indicates a twenty percent markup over the actuarial premium. An α equal to one requires that insurance be sold at actuarially fair odds. Since insurers incur costs aside from claims expenses, α is assumed to be greater than one.

[8]Policy L is analogous to the policy which would be offered by a no tax advantage, non-medical society-controlled Blue Shield plan.

[9]This partial derivative should actually be written as:

$$\frac{\partial R}{\partial \alpha} = \frac{\partial I_S}{\partial \alpha} \frac{\partial I_S^e}{\partial \alpha}$$

However, since the second term on the right hand side is zero, the expression given in the text is appropriate.

[10]Since endowment income is fixed in state S, income in that state can increase only if insurance coverage increases.

[11]Numerous other explanations can be offered for the continued presence of firms in the commercial segment of the health insurance market. First, commercial companies generally sell health insurance as part of a package to employers. Krizay and Wilson have suggested that these firms use health coverage as a "loss leader" to induce the purchase of more profitable lines like life insurance [22]. Additionally, incomplete Blue Shield (or Blue Cross) market dominance may be attributable to the historic failure of the Blues to underwrite national accounts. At one time this was a serious problem for both Blue Cross and Blue Shield because benefit packages and underwriting practices were not coordinated across plans. Although agencies were established by the Blues to facilitate the enrollment of national organizations, subscriber growth of these groups was retarded in the 1960's. For a discussion of commercial health insurance as a loss leader see [6, 7, 22, 24].

[12]Sloan calculates a weighted average of the cost-of-living values in each cross-sectional area [26]. Cities in Blue Shield market areas with a corresponding cost-of-living value were taken as representative of all urban areas within a Blue Shield plan jurisdiction. When no city within a Blue Shield plan area had an associated cost-of-living value reported by the BLS, the BLS city of nearest proximity was used. The cost-of-living figure was weighted by the percentage of the Blue Shield market area population residing in urban areas. Nonmetropolitan cost-of-living figures were used for non-urban areas within each Blue Shield jurisdiction. Each cost-of-living figure was divided by the average cost-of-living figure for each year. To obtain temporally deflated cost-of-living values the cross-sectionally deflated values were deflated by a national cost-of-living index for the respective years, 1975=100. Nominal conversion factors were divided by this cost-of-living index to obtain real conversion factors.

[13]For a discussion of the effects of specification bias, see [21].

[14]BLS Area Wage Surveys were used for 1974, 1975, and 1976. Each survey contains wages of secretarial or clerical help for approximately 75 SMSA's. Hourly earnings for clerical secretaries were regressed on median city family income, dummy variables corresponding to the four major census regions, and dummy variables for the years 1974 and 1975. Approximately half of the variation in clerical wages was explained by these regressors. Predicted nominal values for SECT were subsequently deflated by the cost-of-living index described above.

[15]The "t" statistic used to determine whether $B_2 + B_3$ are significantly different from zero is:

$$t = \frac{\hat{B}_2\overline{DIFTXF} + \hat{B}_3}{\sqrt{S^2_{e\hat{B}_2} * \overline{DIFTXF}^2 + S^2_{e\hat{B}_3} + 2*\overline{DIFTXF}*COV(\hat{B}_2,\hat{B}_3)}}$$

where $\overline{DIFTXF}$ is the mean tax advantage held over foreign commercial companies, $S^2_{e\hat{B}_2}$, and $S^2_{e\hat{B}_3}$ are the coefficient variances of $\hat{B}_2$ and $\hat{B}_3$, and $COV(\hat{B}_2,\hat{B}_3)$ is the covariance between $\hat{B}_2$ and $\hat{B}_3$. If DUMTXD and DUMTXF are used instead of a continuous tax advantage variable, $\overline{DIFTXF}$ would equal one.

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APPENDIX I

THE EFFECT OF A CHANGE IN THE LOADING FACTOR ON INSURANCE PURCHASES

To determine the sign of (9), the first order conditions (5-8) are totally differentiated with respect to I_H, I_S, λ, and α, to yield the following system of differentials:

$$(9a) \qquad \begin{vmatrix} pU''(I_H) & 0 & -1 \\ 0 & (1-p)U''(I_S) & -\alpha P \\ -1 & -\alpha P & 0 \end{vmatrix} \begin{vmatrix} dI_H \\ dI_S \\ d\lambda \end{vmatrix} = \begin{vmatrix} 0 \\ \lambda P d\alpha \\ -P(I_S^e - I_S)d\alpha \end{vmatrix}$$

Using Cramer's Rule to solve for dI_S and dividing by $d\alpha$ yields:

$$(9b) \qquad \frac{dI_S}{d\alpha} = \frac{-\lambda P + -pU''(I_H)p(I_S^e - I_S)\alpha P}{-(1-p)U''(I_S) - pU''(I_H)(\alpha P)^2} < 0.$$

The denominator of (9b) is positive if conditions for a maximum are satisfied. The numerator is negative if λ is positive and marginal utility of income is decreasing.