

CONSUMER INFORMATION AND PROVIDERS' REPUTATIONS

An Empirical Test in the Market for Psychotherapy

Deborah HAAS-WILSON*

Department of Economics, Smith College, Northampton, MA 01063, USA

Heller School, Brandeis University, Waltham, MA, USA

This paper estimates the price effects of provider-specific reputations measured as the percent of each provider's clients who are referred by 'informed community sources', such as other health professionals, school counselors, businesses, clergy, and attorneys. Using data on the prices of outpatient psychotherapy visits to private-practice social workers in Massachusetts, the results suggest that social workers with established reputations for high-quality care charge higher prices. In addition, the results suggest that intra- and inter-professional competition can constrain the pricing decisions of psychotherapists, and that increasing consumer information increases the effectiveness of this competition.

1. Introduction

The importance of informed consumers to the operation of efficient markets is well accepted. In health care markets, however, consumers are faced with the dilemma of selecting a provider without the benefit of full information on the prices and qualities of available providers. Theory suggests that some health care providers may exploit this asymmetric information by selling low-quality services at high-quality prices, even in markets where consumers can learn about sellers' prices and qualities [Chan and Leland (1982), Cooper and Ross (1984), McGuire (1983)].¹

These models, however, assume that sellers do not establish reputations as

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¹Assuming that consumers can obtain price and quality information about individual sellers at a cost, Chan and Leland (1982) show that uninformed consumers may pay higher prices and receive lower qualities. In a model where uninformed consumers can observe whether or not quality exceeds some minimum level and where uninformed consumers use prices as signals of quality, Cooper and Ross (1984) show that 'dishonest firms' may sell minimum quality goods at high-quality prices to uninformed buyers. In a model where patients can learn about a physician's competence through experience, but patients do not share this information with others, McGuire (1983) shows that there will be too many incompetent physicians in equilibrium.

high-quality or low-quality sellers. In health care markets sellers provide services on a regular basis, and thus sellers have the opportunity to establish reputations or goodwill with consumers. Reputations based on the quality of services provided in the past can serve as signals of the quality of services that will be produced in the future. Thus consumers may be able to learn about sellers' reputations without directly observing their price or quality.

This is theoretical support for the hypothesis that reputation formation with dissemination of this information may correct the market failure due to asymmetric information. Assuming that consumers costlessly communicate among one another so that firms' reputations are public information, Klein and Leffler (1981) show that wealth-maximizing firms will not cheat on promises to sell high-quality products if prices are sufficiently above costs. Assuming that consumers costlessly receive product-specific information that signals sellers' qualities, Wolinsky (1983) shows that the size of the price premium for higher quality products will depend on the informational content of the product-specific information received by consumers. Assuming that sellers establish reputations that become public information, Shapiro (1983) shows that the price premium for higher quality will increase as quality attributes become more difficult to observe and as consumers become more cautious in revising their information about a seller's reputation.

Despite the potential for increased consumer information about sellers' reputations to improve the operation of health care markets, little empirical research has focused on the economic impact of consumer information in health care markets and no empirical research has examined the economic impact of information about providers' reputations in health care markets. Previous research has estimated the impact of advertising restrictions on prices and qualities [Benham (1972), Feldman and Begun (1978), FTC (1980), Kwoka (1984), Haas-Wilson (1986)], the impact of physician density and other market information proxies on prices [Pauly and Satterthwaite (1981), Klevorick and McGuire (1987)]² and the extent of consumer and provider ignorance about price [Gaynor and Polachek (1987)]. The results of previous research suggest that the level of consumer information about health care providers, in general, affects health care prices. Previous research, however, does not analyze the price effects of information about a particular provider's reputation and quality. The theoretical literature suggests that it is provider-specific information about sellers' reputations that has the potential to ameliorate market failure.

Accordingly, this paper presents an econometric study of the impact of

²Pauly and Satterthwaite (1981) acknowledge that their results 'must be considered tentative because . . . proxy variables are used to represent consumer information, and we are uncertain as to how well they do their job' (p. 492). The consumer information proxy variables included in their study include physician density, the percent of housing units occupied by residents who moved into the unit in the last 5 years, and the percent of families that have female heads.

provider-specific information on providers' fee-setting behavior. In particular, the impact of information about providers' reputations on the prices of outpatient psychotherapy provided by social workers in private practice is analyzed in markets characterized by different levels of interprofessional competition. The theoretical results presented by Klein and Leffler (1981), Shapiro (1983), and Wolinsky (1983) suggest that if increased consumer information can ameliorate the market failure in health care markets, then increased information about a particular provider's reputation for high-quality care will increase that provider's price and increased information about a particular provider's reputation for low-quality care will decrease that provider's price.

2. Provider-specific information in health care markets

While a seller's reputation or other seller-specific information is known by all consumers in the models developed by Klein and Leffler (1981), Shapiro (1983), and Wolinsky (1983), provider-specific information is private, rather than public information in health care markets. Thus, each consumer's information about a provider's reputation or each consumer's perceptions of a provider's relative qualifications will depend upon his/her information sources (i.e., who he/she asks for a recommendation or referral). Recommendations or referrals based on accurate information about a provider's ability and willingness to provide high-quality care will result in repeated sales to satisfied consumers. Thus, 'informed referrals' may increase demand for high-quality providers and *ceteris paribus*, increase fees for high-quality providers. This price premium for high-quality provides the incentive to continue to produce high-quality services. Referrals from less informed sources may not provide accurate information about quality, and thus may not lead to repeated sales and the potential to earn a price premium.

Most of the literature on referrals in health care markets defines a referral as 'the permanent or temporary transfer (including sharing) of responsibility for a patient's care from one physician to another' [Shortell and Anderson (1971, p. 41)], and thus focuses exclusively on physician-to-physician referrals. However, health care consumers often choose their health care providers based on nonphysicians' recommendations.

Little is known about the determinants of referral patterns among friends, relatives, co-workers, and other nonphysicians or the determinants of referral patterns among physicians. The focus in the physician referral literature has been on the determinants of referral rates,³ rather than on the factors

³For a review of this literature, see Henley (1985). With respect to nonpsychiatric physicians' referrals to psychiatric physicians, Hull (1979) found that psychiatric referrals increased with the number of staff of the nonpsychiatric physician and decreased with the nonpsychiatric physicians's knowledge about psychotropic medication.

influencing the referring physician's choice between two potential consulting physicians in the same specialty.

With respect to referral patterns among physicians, Luft and Arno (1986) argue that perceptions of expertise and quality, rather than price, will be the major consideration in making a referral. Hummell, Kaupen-Haas, and Kaupen (1970), in their study of physicians in Germany, concluded 'the chances of a physician to receive referrals from his colleagues depend essentially upon the recognition of his professional competence by these same colleagues' (p. 602). Ludke and Levitz (1983) found that the most important factors in deciding where to refer breast cancer patients are quality of care given to patients by consulting physicians and the referring physician's personal knowledge of the consultant.

With respect to referral patterns among nonphysicians, Barker (1984) wrote, 'Psychiatrists', psychologists, lawyers, school counselors, and the clergy can also be important referral sources for social workers... These professionals will probably refer only if they know the worker directly, or know the worker's special expertise indirectly.'

Thus, referral patterns among physicians and informed nonphysicians may reflect perceptions of individual provider's expertise and quality or individual provider's reputations. However, the recommendations of less informed nonphysicians, such as friends and relatives, may not provide as accurate information on quality. Accordingly, in this paper favorable provider-specific information or knowledge of a social worker's reputation for high-quality care is measured as the percent of each social worker's clients who are referred by 'informed community sources', such as other mental health providers, other health providers, school counselors, businesses, clergy, and attorneys.⁴ In the market for psychotherapy in Massachusetts the data show that, on average, 35% of a social worker's clients are referred by other mental health professionals, 13% are referred by health professionals and social service agencies, 6% are referred by attorneys, schools, and businesses, 1% are referred by friends and relatives, 24% are self-referred, and 21% are referred by others.

3. The empirical model

When there are many sellers and information is costly, the relevant market structure is monopolistic competition rather than perfect competition [Salop (1976)]. Accordingly, the market for outpatient psychotherapy is modeled as a monopolistically competitive market and the fee charged by the *i*th social

⁴Unfortunately, the data do not include a separate category for referrals from previous clients. Previous (and satisfied) clients may be an excellent source of information on high-quality care.

worker (FEE_i) is assumed to be a function of social workers i 's marginal cost (MC_i) and price elasticity of demand (e_i):

$$FEE_i = f(MC_i, e_i). \quad (1)$$

Changes in the level of information about the quality of services provided by social worker i may affect social workers i 's elasticity and fee. If social worker i provides high-quality care, he/she earns a reputation for high-quality care and receives more referrals from informed sources, then he/she will have more clients and more satisfied clients. More satisfied clients may be less likely to decide to leave social worker i 's practice if social worker i increases his fee. Thus recommendations or referrals based on accurate information about the quality of care provided by provider i may make e_i less elastic. Further, consumers will be more likely to choose a relatively expensive social worker if that social worker is known as a high-quality provider.

In the empirical model provider-specific information about social worker i is measured as the percent of social workers i 's clients who are referred by 'informed community sources', such as other mental health professionals, health professionals, attorneys, school counselors, businesses, and social service agencies ($\%INFORMED\ REFERRALS$). In an alternative specification of the empirical model knowledge of a social worker's reputation for high quality care is measured as the percent of each social worker's clients who are referred by 'informed health sources' – other mental health providers, health professionals, and social service agencies ($\%HEALTH\ REFERRALS$).

Social workers' demand elasticities and fees may also be affected by the availability of other psychotherapists. While the services of other psychotherapists (psychiatrists, clinical psychologists, psychiatric nurses, and other health providers) are not perfect substitutes for the services of clinical social workers, increases in the number of mental health professionals may make social worker i 's demand more elastic and result in increased intra- and inter-professional price competition. Accordingly, the empirical model includes one of these three measures of the number of psychiatrists, psychologists, and social workers per 100 persons in the local market ($PROVIDERS/POPULATION: TOTAL\ PROVIDERS/POPULATION$, or $PSYCHIATRISTS/POPULATION$, or $SOCIAL\ WORKERS/POPULATION$).

The expected benefits of search or consumers' incentives to search for lower-priced social workers will also affect the extent of consumer search. Marquis (1985) shows that the optimal amount of search time depends on consumers' insurance benefits ($\%NO\ INSURANCE$). An increase in co-

insurance directly increases the benefits of search; however, it also leads to reduced consumption of health care and therefore indirectly reduces the benefits of search. Thus, the impact of mental health insurance on consumer search for lower-priced social workers is theoretically ambiguous. However, mental health insurance will affect demand for psychotherapy, and thus social workers' fees.

The impact of consumer income ($\%INCOMES > \$30,000$) on optimal search time is also theoretically ambiguous. Since the major cost of search is time and the opportunity cost of time is higher for persons with higher incomes, consumers with higher incomes may be willing to trade more money (i.e., pay higher prices) for savings of their own time (i.e. less search time). However, if psychotherapy is a normal good, then increases in income will lead to increased demand for mental health services and thus higher fees and greater benefits to search.

Further, social workers' fees are determined, in part, by the regulatory environment and the behavior of health insurers. In many states health insurers treat psychiatrists, psychologists, and social workers differently with respect to eligibility for reimbursement for covered mental health services. Psychiatrists are qualified as independent providers in all insurance plans that include coverage for psychotherapy. While coverage for psychotherapy provided by psychologists and social workers is determined by state freedom-of-choice (FOC) and vendorship laws. In the 40 states that have enacted FOC laws [McGuire et al. (1984)], insurers must reimburse psychologists directly and independently of a physician's supervision. In the 15 states that have enacted vendorship laws [NASW (1987)], insurers must reimburse qualified social workers directly and independently of a physician's supervision.

Accordingly, the empirical model includes the percent of a social worker's bills submitted for insurance reimbursement using his/her own name ($\%REIMBURSE OWN NAME$) as an independent variable. This variable measures a social worker's status with respect to eligibility for direct insurance reimbursement or a social worker's capacity for autonomous functioning – independent of psychiatrists' or psychologists' supervision.

Lastly, a social worker's marginal cost of providing outpatient psychotherapy will affect his/her fee. The opportunity cost of social worker i 's time is a function of social worker i 's human capital, such as total years of social work experience ($TOTAL EXPERIENCE$) and experience in current private practice ($PRIVATE EXPERIENCE$). Further, the average wage of persons in manufacturing ($WAGE$) is included as a measure of input costs by county.

Accordingly, to estimate the impact of consumer information about social workers' reputations, and the impact of intra- and inter-professional competition on social workers' fees in the market for outpatient psychotherapy the following equation is estimated:

$$\begin{aligned}
 FEE_i = h(\%INFORMED\ REFERRALS_i, FEMALE_i, TOTAL \\
 EXPERIENCE_i, PRIVATE\ EXPERIENCE_i, \\
 \%REIMBURSE\ OWN\ NAME_i, \%NO\ INSURANCE_i, \\
 \%INCOMES > \$30,000_i, PROVIDERS/POPULATION, \\
 WAGE). \quad (2)
 \end{aligned}$$

4. The data

The variable definitions are listed in table 1 and the means and standard deviations of the variables are listed in table 2. Questionnaires regarding social workers' personal characteristics, practices, and case loads were mailed to a 14% sample ($N=607$) of licensed clinical social workers (LCSWs) in Massachusetts in October of 1983 or 18 months after vendorship legislation became effective in Massachusetts.⁵ The response rate was 68% ($N=413$).

The zip code of each social worker's private practice was used to match the individual social worker data to county level data on input costs and the number of mental health professionals. County-level data on the number of psychiatrists, psychologists, and social workers were collected by Frisman (1986).

5. The empirical results

Eq. (2) is estimated in linear form using two specifications. In the first specification the provider-specific information variables and the competition variables ($\%INFORMED\ REFERRALS$, $\%HEALTH\ REFERRALS$ and $PROVIDERS/POPULATION$) are included separately. The second specification includes $\%INFORMED\ REFERRALS \times PROVIDERS/POPULATION$, and therefore allows for a potential interaction between the level of interprofessional competition and provider-specific information about reputations. It is possible that inefficient consumer search due to low levels of provider-specific information will affect the extent to which inter-professional competition constrains social workers' fee-setting behavior.

The results of ordinary least squares regressions using the first and second specifications are reported in tables 3 and 4, respectively. These results suggest that reputation formation with the dissemination of this information ameliorates the market failure in the market for psychotherapy. Favorable provider-specific information, measured as the percent of a social worker's

⁵As of April 1982, LICSW were recognized as independent mental health providers for insurance reimbursement in Massachusetts.

Table 1
Variable descriptions.

Variable	Description
<i>FEE</i>	Fee for 50 minutes of individual psychotherapy
<i>TOTAL EXPERIENCE</i>	Years of social work experience
<i>PRIVATE EXPERIENCE</i>	Months in current private practice
<i>FEMALE</i>	= 1 if social worker is female, 0 otherwise
<i>%INCOMES > \$30,000</i>	Percent of social worker's clients with incomes > \$30,000
<i>%NO INSURANCE</i>	Percent of social worker's clients with no mental health insurance
<i>%REIMBURSE OWN NAME</i>	Percent of social worker's bills submitted for reimbursement using own name
<i>%INFORMED REFERRALS</i>	Percent of social worker's clients referred by 'informed community sources' (i.e., referred by health professional, school, business, attorney)
<i>%HEALTH REFERRALS</i>	Percent of social worker's clients referred by health professionals
<i>WAGE</i>	Average county wage of employees in manufacturing in 1983
<i>TOTAL PROVIDERS/POPULATION</i>	Psychiatrists, psychologists, and social workers per 100 persons in county
<i>PSYCHIATRISTS/POPULATION</i>	Psychiatrists per 100 persons in county
<i>SOCIAL WORKERS/POPULATION</i>	Social workers per 100 persons in county

clients who are referred by 'informed community sources' and the percent of a social workers' clients who are referred by 'informed health sources', has a positive and statistically significant effect on a social worker's fee. The results in table 3 show that a 10% increase in *%INFORMED REFERRALS* results in a 0.49 to 0.54% increase in a social worker's fee. A 10% increase in *%HEALTH REFERRALS* results in a 0.44% increase in a social worker's fee. Similarly, the results in table 4 show that favorable provider specific information has a positive effect on a social worker's fee. This is consistent with the theoretical work of Klein and Leffler (1981), Shapiro (1983), and Wolinsky (1983). However, in areas where there is more competition, the price increasing impact of informed referrals appears to be less. The null hypotheses that

- (1) the sum of the coefficients on *%INFORMED REFERRALS* and $\%INFORMED\ REFERRALS \times TOTAL\ PROVIDERS/POPULATION$ is equal to zero,

Table 2
Variable means and standard deviations.

Variable	Massachusetts data (N = 91)	
	Mean	Standard deviation
FEE	46.51	7.16
TOTAL EXPERIENCE (years)	13.22	9.02
FEMALE	0.81	0.39
PRIVATE EXPERIENCE (months)	47.43	42.75
%INCOMES > \$30,000	0.35	0.30
%NO INSURANCE	0.25	0.25
%INFORMED REFERRALS	0.62	0.34
%HEALTH REFERRALS	0.55	0.36
PSYCHIATRISTS/POPULATION	0.05	0.02
TOTAL PROVIDERS/POPULATION	0.23	0.09
SOCIAL WORKERS/POPULATION	0.11	0.04
WAGE	17.73	1.80
%REIMBURSE OWN NAME	0.96	0.13

- (2) the sum of the coefficients on *%INFORMED REFERRALS* and $\%INFORMED\ REFERRALS \times PSYCHIATRISTS/POPULATION$ is equal to zero,
- (3) the sum of the coefficients on *%INFORMED REFERRALS* and $\%INFORMED\ REFERRALS \times SOCIAL\ WORKERS/POPULATION$ is equal to zero

can be rejected at the 10% level of significance.

The results also suggest that inter-professional competition between psychiatrists, psychologists, and social workers and intra-professional competition among social workers can constrain the pricing decisions of social workers. The results in table 3 show that a 10% increase in the number of psychiatrists, psychologists, and social workers per 100 persons results in a 2.08% decrease in social workers' fees. Similarly, a 10% increase in the number of psychiatrists per 100 persons results in a 2.53% decrease in social workers' fees and a 10% increase in the number of social workers per 100 persons results in a 1.86% decrease in social workers' fees. Similarly, the results in table 4 show that competition constrains fees. Further, the results in table 4 suggest that increasing consumer information about social workers' reputations increases the negative impact of inter- and intra-professional competition on social workers' fees. The null hypotheses that

- (1) the sum of the coefficients on *TOTAL PROVIDERS/POPULATION* and $\%INFORMED\ REFERRALS \times TOTAL\ PROVIDERS/POPULATION$ is equal to zero,
- (2) the sum of the coefficients on *PSYCHIATRISTS/POPULATION* and

Table 3
Regressions on social workers' fees (standard errors in parentheses).

Variable	(A)	(B)	(C)	(D)
<i>CONSTANT</i>	51.17*** (13.81)	39.85** (16.51)	53.92*** (14.02)	51.75*** (13.79)
<i>%INFORMED REFERRALS</i>	3.89* (2.22)	4.05* (2.21)	3.75* (2.24)	
<i>%HEALTH REFERRALS</i>				3.74* (2.18)
<i>TOTAL EXPERIENCE</i>	-0.12 (0.10)	-0.12 (0.10)	-0.12 (0.10)	-0.12 (0.10)
<i>PRIVATE EXPERIENCE</i>	0.00 (0.02)	0.00 (0.02)	0.00 (0.02)	-0.01 (0.02)
<i>FEMALE</i>	-1.12 (1.91)	-1.26 (1.90)	-1.10 (1.92)	-1.41 (1.92)
<i>%NO INSURANCE</i>	-5.48* (2.93)	-5.62* (2.91)	-5.59* (2.95)	-5.86** (2.96)
<i>%INCOMES > \$30,000</i>	2.39 (2.50)	2.36 (2.48)	2.22 (2.52)	2.90 (2.50)
<i>%REIMBURSE OWN NAME</i>	-12.98** (5.46)	-13.69** (5.44)	-12.95** (5.50)	-12.73** (5.47)
<i>WAGE</i>	1.03 (0.90)	1.83* (1.11)	0.83 (0.92)	1.02 (0.90)
<i>TOTAL PROVIDERS/ POPULATION</i>	-42.34** (17.30)			-42.83** (17.40)
<i>PSYCHIATRISTS/ POPULATION</i>		-230.30*** (86.86)		
<i>SOCIAL WORKERS/ POPULATION</i>			-82.42** (38.66)	
<i>R²</i>	0.23	0.24	0.21	0.22
<i>F</i>	2.63	2.77	2.43	2.61
<i>N</i>	91	91	91	91

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

- %INFORMED REFERRALS* + *PSYCHIATRISTS/POPULATION* is equal to zero,
 (3) the sum of the coefficients on *SOCIAL WORKERS/POPULATION* and *%INFORMED REFERRALS* × *SOCIAL WORKERS/POPULATION* is equal to zero

can be rejected at the 5% level of significance.

The extent of insurance coverage for mental health services has a statistically significant effect on social workers' fees. A 10% increase in the percent of a social worker's clients without mental health insurance coverage results in a 0.29 to 0.31% decrease in the social worker's fee. This provides support for the argument that increased cost-sharing will provide the

Table 4
Regressions on social workers' fees (standard errors in parentheses).

Variable	(A)	(B)	(C)
<i>CONSTANT</i>	46.97*** (14.04)	34.84*** (16.78)	47.71*** (14.52)
<i>%INFORMED REFERRALS</i>	11.14** (5.55)	10.56** (5.06)	11.61** (5.70)
<i>TOTAL EXPERIENCE</i>	-0.15 (0.10)	-0.16 (0.10)	-0.15 (0.10)
<i>PRIVATE EXPERIENCE</i>	0.00 (0.02)	0.00 (0.02)	0.00 (0.02)
<i>FEMALE</i>	-1.78 (1.94)	-1.76 (1.92)	-1.74 (1.95)
<i>%NO INSURANCE</i>	-5.38* (2.91)	-5.66** (2.89)	-5.47* (2.93)
<i>%INCOMES > \$30,000</i>	2.06 (2.49)	2.08 (2.47)	1.92 (2.50)
<i>%REIMBURSE OWN NAME</i>	-12.93** (5.42)	-13.62** (5.40)	-12.91** (5.46)
<i>WAGE</i>	1.12 (0.89)	2.00* (1.11)	1.06 (0.92)
<i>TOTAL PROVIDERS/POPULATION</i>	-25.15 (21.02)		
<i>%INFORMED REFERRALS* TOTAL PROVIDERS/POPULATION</i>	-33.69 (23.68)		
<i>PSYCHIATRISTS/POPULATION</i>		-165.37* (97.54)	
<i>%INFORMED REFERRALS* PSYCHIATRISTS/POPULATION</i>		-135.97 (95.15)	
<i>SOCIAL WORKERS/POPULATION</i>			-48.95 (44.41)
<i>%INFORMED REFERRALS* SOCIAL WORKERS/POPULATION</i>			-78.26 (52.32)
<i>R²</i>	0.25	0.25	0.23
<i>F</i>	2.60	2.73	2.45
<i>N</i>	91	91	91

***Significant at the 1% level.

**Significant at the 5% level.

*Significant at the 10% level.

incentive for consumers to search for lower-priced physicians and thus increase competition among physicians. Or to the extent that provider-specific insurance coverage is measuring between-community variation in insurance coverage, the negative and statistically significant impact of *%NO INSURANCE* could be measuring an effect of insurance on demand for mental health services (less insurance, lower demand, lower fees).

A social worker's capacity for autonomous functioning has a significant

and negative impact on his/her fee. After vendorship legislation became effective, Blue Shield required LICSWs to bill under their own names and at the lower (relative to psychiatrists and psychologists) rate for LICSWs. However, the vendorship legislation did not affect the reimbursement policies of self-insured employee groups, Medicaid, CHAMPUS, or the Federal Employees Health Benefit Program. Thus, psychiatrists, psychologists, and other physicians in private practice may still be employing LICSWs and billing insurers other than Blue Shield at their own higher rates.

6. Conclusions

The extent to which market forces can constrain physicians' pricing decisions is becoming an increasingly important factor in the public policy debate concerning whether the government should encourage competition or increase regulation in health care markets. The results presented in this paper suggest that two market forces – increased search by more informed consumers and increased competition between mental health providers can constrain the pricing decisions of social workers.

Provider-specific information about social workers' reputations and intra- and inter-professional competition appear to affect the fees charged by social workers in Massachusetts. The results suggest that social workers with established reputations for high-quality care charge higher prices. In addition, the results suggest that intra- and inter-professional competition can constrain the pricing decisions of psychotherapists, and that increasing consumer information increases the effectiveness of this competition.

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