

Nature of Competition and Regulation in Health Care Markets : Implications for Public Policy

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〈국문요약〉

보건의료분야에서의 경쟁과 규제의 본질 : 공공정책적 함의

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권 순 만

민간 시장에서의 경쟁의 실패는 일반적으로 정부개입과 규제의 대표적인 근거를 제공한다. 하지만 보건의료분야는 정보의 비대칭성, 의료보험의 보편화, 고가의료기술및 장비에 의한 비용상승 등과 같은 특수성으로 인하여, 정부가 단순히 충분한 의료공급자나 병원의 수를 보장함으로써 가격의 하락과 서비스 양의 증가와 같은 경쟁의 효과를 기대하기 힘들다. 본 논문은 경쟁과 규제와 관련한 보건의료의 특수성과, 보건의료분야에서 경쟁이 소비자 후생에 미치는 영향에 관한 이론 및 실증분석의 결과들을 고찰한다. 나아가 경쟁과 규제가 조화된 지속가능한(sustainable) 보건의료체계를 위해, 병원설비투자의 직접적인 규제로부터 규제를 통해 경쟁을 촉진시키는 인센티브규제(incentive regulation)로서의 지불보상제도 그리고 필요한 정보의 제공을 통한 시장기능의 회복에 이르는, 정부가 집행할 수 있는 효과적인 정책도구들을 분석한다.

Key words : Competition, Regulation, Physician, Hospital, Information, Insurance, Technology, Payment System

〈Abstract〉

One rationale for government intervention is the failure of competition in the market. Health care markets are characterized by such unique aspects as information asymmetry, prevalence of insurance, and cost-increasing competition based on the adoption of costly medical technology. Therefore, government policy to guarantee a sufficient number of providers in markets may not lead to socially beneficial outcomes such as higher quantity and lower price. This paper examines the unique nature of health services and its implications for competition, the evidence that competition may not reduce health care expenditures, and policy tools that government can use to encourage competition which contributes to supporting a sustainable health care system.

I. Introduction

One of the most frequently discussed issues of public policy in the United States is health care reform. Although the core element of current discussion in health policy is expanding health insurance coverage to all people, if health care reform does not affect the continuous increase in health care cost, reform cannot be sustained in the long run. With limited resources, health cost inflation will inhibit coverage expansion or lead to curtailment of health insurance benefits. At the same time, how to organize the delivery of health services to a great extent determines the expenditure, quality and access in the health care system. The critical and unique role of government in the financing and organization of health services is therefore interrelated. This paper intends to discuss the role of government (public policy and regulation) and market (competition) in the organization and delivery of health services.

One rationale for government intervention is the failure of competition in the market. A smaller number of providers in the market increases the monopoly power of the providers,

and hence, decreases consumer welfare. The assumption of this textbook economic theory is that, except for the natural monopoly associated with the economies of scale, competition among providers or a greater number of sellers in the market always leads to efficient outcomes such as higher quantity and lower price (Tirole 1988).

Due to the unique nature of competition among health care providers, a sufficient number of providers does not always produce socially efficient outcomes in health care markets. Information asymmetry between providers and consumers hinders the rational decision making of patients, whose incentives to make rational choices are further weakened by the price insensitivity introduced by health insurance. Nonprice competition among health care providers may result in the costly adoption of too much medical technology. Therefore, government policy toward guaranteeing the sufficient number of providers may not help reduce ever-increasing health care expenditures. Government policy to promote competition in health care markets should be designed in a different way from other industries. This paper examines the unique nature of health services and its implications for market competition, the evidence that competition may not reduce health care expenditures, and policy tools that government can use to encourage competition which contributes to supporting the sustainable health care system.

II. Uniqueness of Health Services

The purpose of this section is to examine some unique aspects of health services which have a critical impact on the nature of competition and the role of government in health care markets.

1. Information Asymmetry

Health care providers have a much greater level of knowledge and information than consumers about the diagnosis and treatment of disease. Consumers therefore have a limited

capability to evaluate the true quality of health services, which should be measured in terms of patient outcomes, i.e., improvement in health status, or adverse effects such as mortality, complications, or readmissions. Imperfect information about the quality of care hinders consumers from rationally choosing among providers, and to a great extent makes it possible for providers to influence the patients' consumption of medical services. Due to information asymmetry about treatment outcomes, consumers perceive the quality of services based on the structural measures of quality such as high-technology medical services and equipment. Following the consumers' perception about the quality of care, providers adopt highly specialized clinical services and acquire medical equipment as a (costly) way of signalling quality to consumers. Although costly medical technology improves the health status or well-being of patients, it is not clear whether the benefit is greater than the cost from a societal perspective.¹

2. Insurance

Price insensitivity and increased health care utilization (moral hazard) caused by health insurance results in social welfare loss because it induces people to buy health services that create smaller marginal value than it actually costs to produce. Insurance decreases consumers' incentive to make rational decisions on health care utilization while information asymmetry constrains their ability to make rational decisions. The second best solution for alleviating the problem of the moral hazard is consumer cost-sharing mechanisms, such as coinsurance and deductibles, which sacrifice some of the consumers' benefit of risk-spreading in order to provide incentives for consumers to reduce health care utilization (Zeckhauser, 1970).

3. Technology²

In health care markets, the introduction of new products or services that increase both

quality and cost has been more popular than process innovation that makes existing treatment processes less costly. It is likely that consumers overestimate the contribution of medical technology to improvements in health and demand excessive amounts of high-technology services. Even if consumers have the knowledge and information to evaluate highly-sophisticated medical technology, they have incentives for overutilization of technology-related services and equipment when these are covered by insurance.³ Socially inefficient (excessive) diffusion and innovation of expensive medical technology caused by information asymmetry and health insurance are regarded as the major determinants of health care cost inflation.⁴

III. Competition in Health Care Markets

In health care markets characterized by information asymmetry and the prevalence of insurance, it is likely that quality (nonprice) competition is more dominant than price competition. The common way of signalling quality to consumers is the adoption of costly medical technology. Competition is socially inefficient when increased costs resulting from quality competition are greater than what consumers would be willing to pay if they were perfectly informed about the quality of services and benefits of medical technology. This section reviews conceptual models and empirical evidence that competition in health care markets does not lead to efficient outcomes such as higher quantity and lower price.

1. Physician Services Market

The typical example of the perverse outcome of competition in physician services markets is demand inducement by providers. Since the physician provides information (diagnosis) as well as medical services (treatment), she may have an incentive to maximize income by distorting the diagnostic information to provide more services than are necessary. When income opportunities fall due to competition among increased numbers of prov-

iders (or price control by the government), the physician may induce patients to use more than those amounts of care that patients would demand if they had the same knowledge and information as the physician. Since patients are imperfectly informed about their needs for medical care, they are likely to follow the physician's recommendation. An increased number of providers in a market could result in too many (unnecessary) services and increased price. Providers may counteract the pressure of competition by creating demand and shifting the demand curve outward.

Empirical evidence of physician-induced demand is inconclusive. For example, Cromwell and Mitchell (1986) and Fuchs (1978) found some evidence of demand inducement for surgery whereas McCarthy (1985) and Escarce (1992) did not find support of demand inducement for primary care physicians and surgeons.⁵ Despite controversial empirical evidence, potential market failure is evident because of knowledge and information asymmetry between the physician and the patient. Providers may choose the optimal amount of inducement that balances their increased income from demand inducement with the decrease in their utility due to ethical burden (McGuire and Pauly, 1991) or harm to their reputation (Dranove, 1988). Even if the increase in demand (shift in the demand curve) results not from demand inducement by physicians but from consumers' rational response to quality improvement following an increased supply of physicians, the question remains as to whether the amount of the increase in demand is reasonable from a societal perspective. If consumers overestimate (or underestimate) the benefits of the change in quality, the increase in demand is beyond (or below) the socially optimal level.

The potential failure of health care competition under information asymmetry (even without introducing demand inducement) is also evidenced by Satterthwaite (1979) and Pauly and Satterthwaite (1981).⁶ They characterize the physician services market as monopolistically competitive. Each physician has some monopoly power because physician services are not perfectly homogeneous in terms of practice style and technical competence. If a physician raises the price of her services, she loses some but not all of the market share of patients. However, no single physician is a monopoly firm. An increase in the number

of providers in the market reduces the amount or quality of information that consumers have about each provider. As a result, the search for new providers becomes more difficult, and consumers become less price sensitive. A greater number of providers increases the monopoly power of each provider, and hence results in higher prices.

2. Hospital Services Market

In the hospital services market, the choice of hospital and the market share of each hospital are greatly influenced by physicians because patients are referred to hospitals by physicians in many cases. Hospitals have incentives to purchase better medical technology and services to attract consumers and doctors. High-technology medicine has two benefits for physicians: (1) It provides more accurate diagnosis, and better treatment can reduce the probability of malpractice, and (2) medical technology can be a substitute for a physician's own time, and hence increases physician utility --physicians can enjoy more leisure or treat more patients for more income. Since consumers perceive medical technology as increasing the quality of care, they also favor highly-specialized medical technology. Even if consumers are perfectly informed about the benefits of sophisticated medical technology, insured people demand excessive amounts of high-technology services because they do not pay the full price of utilizing them (moral hazard). A staff of highly specialized physicians who are attracted to the hospital is also regarded by consumers as an important determinant of health care quality.

When the number of hospitals increases in the market, hospitals compete to attract patients and physicians by adopting costly medical technology. Hospital competition leads to the medical arms race: competitive adoption of high-technology medical services and expensive equipment. Hospital competition results in cost increase and inefficiency stemming from underutilization of high-technology services and equipment due to duplication (Dranove, Shanley and Simon, 1992; Joskow, 1980; Luft et al., 1986; Noether, 1988; Robinson and Luft, 1985).⁷

When hospitals are engaged in wasteful nonprice competition as described above, a decrease in the number of hospitals in the market by, for example, hospital merger and acquisition, could increase efficiency and social welfare. Cost-increasing competition is avoided, and the larger business benefits from economies of scale and scope. Therefore, anti-trust cases in hospital markets should be evaluated based on the rule-of-reason, and, in particular, on the nature of competition in a given market.

IV. Role of Government and Public Policy

Government policy toward promoting competition in health care markets is not simply to guarantee the sufficient number of providers to facilitate competition because it does not necessarily produce desirable outcomes as predicted by traditional economic theory. To control ever-increasing health care expenditures, it is necessary for the government either to directly regulate provider behavior or to change the environment of competition in health care markets. The government can intervene directly in health care markets and constrain capital expenditures such as beds and technology. The more efficient policy is to make competition work to curb health care cost inflation. For that purpose, the government needs to empower consumers by alleviating problems of information asymmetry. Finally, by structuring financial incentives or payment systems for providers, the government can induce providers to reduce health care costs and change the nature of competition from wasteful to socially efficient.

1. Capital Expenditures

To contain health care costs resulting from duplication and underutilization of medical technology and facilities, the government can adopt regional planning for capital investment in physical assets. An example of this type of regulation is the certificate of need (CON). A public agency determines the “need” of a given geographic area in terms of cap-

ital expenditures, i.e., how much equipment or how many beds are needed in a community. The planning agency allows new investment in those physical assets only if the need of a community is not met by the existing facilities. The impact of the CON regulation has been disappointing, however, as it has failed to reduce health care costs (Joskow, 1981; Sloan and Steinwald, 1980). Since the CON is targeted to control expenditure of a specific input (physical assets), hospitals substitute nonregulated and costly inputs (e.g., specialized personnel or staffs and other nonphysical inputs to signal quality) for regulated inputs. The CON regulation could even be anticompetitive because it might lead to barriers for new hospital entrants to the market, thus increasing the monopoly power of existing hospitals. A more fundamental policy to curb the excessive diffusion of costly technology is to directly control the source of technology diffusion, in other words, the research and development (R&D) of medical technology. The government should provide incentives (e.g., tax benefits) for the medical technology industry to develop cost-reducing technologies.

2. Information Asymmetry

It has been shown that information asymmetry hinders consumers from rational choices and contributes to the perverse nature of health care competition. Therefore, restoring well-functioning health care markets hinges on how to help consumers become well informed about the quality of services. Licensure of health professionals is one of the traditional ways the government ensures (indirectly provides information about) the quality of health services when consumers have difficulty evaluating quality.⁸ However, the relationship between training and skills required by the licensing and actual performance may be low. Licensure serves as a minimum quality standard and does not necessarily facilitate competition by helping consumers make a rational choice.

More importantly, the government can collect and disseminate information about the quality of services from health care providers. For example, the Health Care Financing

Administration (HCFA) of the U.S. Department of Health and Human Services calculates the mortality rate of Medicare patients (adjusted for case mix, i.e., patients' severity) in hospitals and makes the information available to the public. Due to the public good nature of the information about quality, the private sector does not have the incentive to participate in the development and dissemination of this type of information. Owing to the scale economies of data collection and processing, the government can efficiently provide purchasers of health services (consumers and health plans) with critical information about health care quality. Consumers and health insurers can then rationally choose from providers based on reliable information about objective outcomes of treatments. Hence, consumers can better evaluate the benefit of health services, and problems of overutilization or underutilization due to imperfect information will be mitigated. Since consumers can make informed choices, unnecessary and cost-increasing competition, to enhance the structural measures of quality, will be reduced. And, social welfare gain resulting from competition among providers to improve outcome-based quality is expected.

Government policy toward the disclosure of information to help consumers become better informed thus fostering competition in the market already exists in other industries. For example, the FTC (Federal Trade Commission) and FDA (Food and Drug Administration) require firms to disclose information through labeling about ingredients, nutrition, and performance (e.g., fuel and energy efficiency of automobiles and appliances). In the health care sector however, instead of requiring suppliers to provide such information, the government plays a more active role and directly provides the information. The appropriate measure of health care quality we are concerned about is not simply the characteristic of the service provided, but rather its actual effect on patient health as a final outcome of consumption. Since one needs to take into account not only the service characteristic but also other factors (e.g., initial health status of the patient) affecting the change in patient health after treatment, it is more costly to provide information about quality in the health care sector than in other industries. Direct information provision by the government is needed because it is not certain whether hospitals have the capability and willingness to

produce the complicated and costly information about the effect of their services on the health of patients.

The government is also active in developing and disseminating information about appropriate standards of health care. The role of the government in this area has been motivated by studies of large (cross-sectional) variations in utilization rates in similar populations, holding constant the variables (such as age, income, insurance and disease patterns) affecting demand (see Phelps (1992) for a summary of empirical evidence). Variation in health care delivery is believed to be caused by confusion and disagreement among providers about the efficiency of various types of medical interventions (Wennberg, 1984). In other words, there is a lack of agreement as to what is the best way of treating given illnesses. The Agency for Health Care Policy and Research (AHCPR) funds outcomes research, developing practice guidelines based on outcomes research, and disseminating information about them. The public good nature of that type of information again leads to the government production and dissemination of information about outcomes and standards of care. Government involvement is inevitable because even providers themselves have imperfect knowledge about the efficiency of various treatment methods.

The role of the government in developing practice guidelines is more active and requires greater resources than that in the disclosure of information about quality. In developing and disseminating standards of care, the government potentially intervenes in the process of producing health services as well as the outcomes of services. The guidelines are to specify the optimal type (or mix) and amount of medical interventions to achieve better patient outcomes. It is not certain however whether disseminating practice guidelines changes provider behavior and reduces practice variation. As is usually the case in the regulation of production process (rather than outcomes), providers may substitute more profitable treatment for one recommended by the guideline. Government might need to incorporate guidelines in the design of the reimbursement system such that providers have financial incentives to follow guidelines. If the government succeeds in inducing providers to conform to the standards of care, it will increase social welfare by helping

physicians provide the correct type and amount of health services, and by reducing variation in the delivery of health care. It can also encourage competition in health care markets if standards of care and reduced variation in health services decrease consumer ambiguity in the demand for health services.

However, several questions arise associated with the development of practice guidelines. When patients have different preference for treatments, excessive uniformity may hinder beneficial differentiation of services and result in welfare loss of patients. Incorporating patient preference into the design of practice guidelines is an important task. Continued revision of guidelines is required for the development of new technology and treatment methods. And, government needs to determine the optimal time lag between revisions because too frequent revision is costly, yet too infrequent revision can impair patient welfare. Of related concern is that strict enforcement of guidelines can impede innovation in treatment and technology because providers may be passive and satisfied to just meet the standards.

Technology assessment is another important role of the government in the development and dissemination of relevant information. The government should evaluate the benefits and costs of medical technology, make the information available to consumers (patients and insurers) and providers, and help them make rational choices of technology. The results of technology assessment will help insurers make decisions regarding the coverage of specific medical technology in the design of benefit packages. Consumers and providers benefit from the information about technology assessment because they are uncertain about the cost-effectiveness of (especially new) medical technology.

3. Incentive and Payment Systems

3.1 Payment Systems in Health Care Markets

A powerful instrument the government can use to influence provider behavior and reduce health care expenditure is to structure the way providers are paid for treating patient-

ts. The major goal in the design of reimbursement or payment systems should be to make providers more conscious of the effect of their decisions on health care costs by making them bear the risks and economic consequences of their provision of health services. Put differently, payment systems (as supply-side incentives) should give providers incentives to control health care expenditures by varying their income inversely with costs incurred.

Since the consumer cost-sharing mechanism affects health services utilization, increasing coinsurance rates or deductibles contributes to containing costs. However, the increase in cost sharing imposes too much income risk on the patient whose ability to spread those risks is much more limited than the provider. Furthermore, the consumer cost-sharing mechanism imposes a uniform rate of coinsurance or deductible on all patients regardless of their severity of illness (need for health care utilization) and their ability to pay. Providers are better able to bear financial risks than consumers because they treat a variety of patients with different severities of illness --some of patients may require a lot of resources while others do not, converging to the level of cost which is more or less predictable thanks to the law of large numbers. Besides greater risk-spreading ability, providers have better knowledge and information about patients' health care needs (than patients themselves). Supply-side incentive systems also allow providers to tailor medical care utilization to the preference and need of individual patients. In fact, payment systems make providers share the financial burden of health care utilization with patients so that providers benefit from controlling patients' moral hazard.

Hospitals, in traditional cost-based payment systems, are reimbursed the incurred costs of providing services regardless of whether they treat patients in a cost-efficient way. Providers have little incentive to minimize the costs of treating patients because all actual costs are reimbursed by the insurer. If hospitals are reimbursed by a prospective payment system (PPS) however, they are paid the prospectively-determined fixed amount per discharge regardless of the actual costs. Since under PPS providers bear the full marginal cost of additional services per discharge, they have strong incentives to minimize costs of treating patients. An example of this kind of financial incentive system is

the Medicare PPS which is based on diagnosis related groups (DRGs). When admitted to the hospital, a patient is assigned to a DRG which is allocated a predetermined payment regardless of the length of stay (LOS) or the actual resources consumed by patients. The payment level for each DRG is calculated on the basis of the national average cost of treating patients in each DRG. As expected, PPS did reduce or slow hospital inpatient costs by decreasing the LOS of hospital patients, especially for the first two years of PPS implementation (Hadley, Zuckerman and Feder, 1989).⁹

The shift from cost-based reimbursement to PPS changes the nature of competition in the health care sector. Health care competition under cost-based reimbursement has been characterized by cost increases stemming from wasteful quality competition. Hospitals have been reimbursed the costs of enhancing the structural measures of quality regardless of the efficiency result of their decisions. It is similar to the pricing dilemma that the government has in the regulation of natural monopoly because the guarantee of a given rate of return does not provide incentives for the firm to reduce costs. Due to information asymmetry, the regulator cannot distinguish justifiable cost increases from unjustifiable ones, leading to the firm's excessive capital investment such as the Averch-Johnson effect (1962). However, since revenue per discharge is fixed under PPS, providers should reduce costs to survive--they cannot afford quality competition without considering its cost and economic consequences. Under PPS, providers should balance the benefit and cost of adopting medical technology. The PPS should therefore reduce provider incentives to adopt costly medical technology. It has been shown that an increased number of hospitals in the market now leads to lower costs or a lower rate of cost increase under PPS, whereas hospitals in less concentrated markets have experienced nonprice competition and higher costs under cost-based reimbursement (Dranove, Shanley and White, 1993; Zwanziger and Melnick, 1988).^{10 11}

As is the case with CON regulation, hospitals under PPS have incentives to substitute outpatient services (to which PPS is not applied) for inpatient services. Health care utilization in outpatient sites, such as hospital outpatient departments, physician offices, and

ambulatory surgery centers has risen sharply after the introduction of PPS (Coulam and Gaumer, 1991). Although outpatient services are less costly than inpatient services, an excessive use of outpatient services or a deviation from the optimal (cost-minimizing) mix of inpatient and outpatient services in the treatment of patients will lead to an increase in overall costs. The contribution of PPS to controlling total Medicare program outlays is limited if the decrease in inpatient expenditures is offset by the increase in outpatient expenditures. A more aggregated form of prospective payment covering both inpatient and outpatient services should be developed to provide hospitals with stronger incentives for cost control and effective management.¹²

If effective payment systems in government-sponsored insurance are diffused into private insurance markets, the effect of payment systems on provider behavior and cost containment will be maximized. If private insurers use charge-based payment systems for providers, hospitals and physicians can raise prices for patients with private insurance to compensate for the losses due to Medicare patients. With cost shifting among payers, the incentives for cost reduction provided by the Medicare PPS are attenuated. Thorpe and Phelps (1990) showed that the all-payer rate setting in New York State, under which all payers were subject to prospectively determined per-diem rates, was effective in reducing hospital costs.

3.2 The Optimal Structure of Payment Systems

The Theory of Incentive Contracts

The theory of principal-agent relationships and incentive contracts sheds several important insights on the design of the optimal structure of payment systems for health care providers. Due to an inherent information asymmetry between the regulator (the principal) and the regulated firm (the agent) about market demand and technology, the former cannot determine the efficient level of production costs of the latter. The regulator needs to structure the payment system in such a way that it both covers the cost of production

and provides the firm with incentives to control costs --“incentive compatibility” (Baron and Besanko, 1987; Laffont and Tirole, 1986). The regulator can make the firm responsible for the change in costs by setting the fixed level of payment regardless of actual production costs, imposing financial risk (in terms of the variation in profit) on the firm. However, the regulator cannot put the firm at risk for the entire variation in costs because some portion of the cost increase is justifiable. The optimal incentive system is then characterized by the tradeoff between the provision of incentives and the benefit of risk-sharing which has frequently appeared in the literature of the contract theory (for example, Holmstrom, 1979; Grossman and Hart, 1983).

Another intuition from the framework of principal-agent relationships is the role of competition among agents. When there are multiple agents, the problem of information asymmetry between the principal and agents can be mitigated because competition among agents reveals the common environmental factor that affects the performance of agents (Holmstrom, 1982). By fixing the hospital payment level based on the average cost (of treating patients in a given diagnosis) of all hospitals in the U.S., PPS effectively forces each hospital to compete with each other to reduce expenditures. This is an example of “yardstick competition” with payment as a yardstick to measure the relative performance of providers (Shleifer, 1985). In order to earn positive net income, hospitals try to reduce their costs of production below the payment which is set equal to the average costs of all hospitals. Since there is little possibility of collusion among hospitals not to reduce costs and hence to keep the payment high, yardstick competition can be effective in providing incentives for hospitals to compete to reduce costs. However, the government needs to make sure that hospitals are competing under common production environments and especially comparable demand conditions (e.g., a need for adjustments for the heterogeneity of patient severity).

Applied to health care providers, due to information asymmetry between government and hospitals, it is too costly for the government to monitor the provision of health services by the hospital. Government cannot perfectly observe the true costs of hospitals which

are determined not only by the efficiency of service provision but also by the nature of hospital outputs (i.e., severity of illness of patients) over which the hospital does not have control. The ideal payment system for hospitals is one that provides the benefit of insurance or risk-spreading associated with the difference in the type of patients (no risks on hospitals under the cost-based payment and full risks under PPS) and the incentives to control costs (little incentive for hospitals to reduce costs under the cost-based reimbursement and maximum incentive to do that under PPS). Then, neither the cost-based reimbursement nor PPS is efficient. This is essentially the same mechanism applied to the design of patients' cost sharing in health insurance: imposing some financial risks on risk-averse patients (i.e., a deviation from full insurance) provides them with incentives to minimize health care utilization--neither zero insurance nor full insurance is efficient. Therefore, the payment system can be viewed as a cost-sharing mechanism for providers to induce them to reduce costs or to control the moral hazard of patients.

Mixed Payment System

Although cost-based reimbursement is inefficient due to the lack of incentives for cost control, a pure PPS might not be efficient either, if the variation of treatment costs within DRGs leads providers to avoid or dump patients with higher expected cost--a perverse form of hospital specialization or segmentation based not on production efficiency but on patients' expected cost. When hospitals are subject to too much pressure for expenditure reduction, they may engage in quality deterioration and cream skimming--attracting relatively healthier patients who have lower expected costs of treatment. Some mix of cost-based system and PPS is efficient because it not only gives providers incentives to minimize costs but also compensates the legitimate cost differences among hospitals due to case-mix differences (Ellis and McGuire, 1990; Kwon, 1993). To determine the optimal weight given to the provider-specific costs as well as the prospective rate is critical for the implementation of the mixed payment system.

Although most insurers are interested in the effects of payment systems and financial

incentives on provider behavior, managed care plans which both finance and deliver health services to enrollees use various supply-side incentive systems, and the market for managed care plans serves as an experiment to examine the role of payment systems. Because managed care plans can recoup the benefit of expenditure reduction through their close relationships with providers (Pauly, 1986), managed care plans are interested in designing effective provider incentive systems in the market for cost control.

To determine the relative weights on the provider-specific costs and prospective rate, Kwon (1997) examined the endogeneity of the structure of payment systems, that is, what factors determine the structure of payment systems? He found that consumer preference, the variation in the costs of treatment due to different patient severity, and the degree of risk aversion of providers affect the structure of the mixed payment system. Patients' willingness to pay for more health services, patient heterogeneity in terms of the cost of treatment (i.e., cost variation) and low degree of providers' risk aversion will increase the weight on provider-specific costs relative to the prospective rate. In HMO markets, rational consumers who understand the effect of financial incentive systems on provider behavior can view the payment system as a signal of the quantity and quality of services. Accordingly, the buyer chooses the HMO which has the payment system that provides the optimal quantity and quality taking into account the premium. Consumer preference for quantity and quality of services is now reflected in his or her choice of the structure of payment systems for providers. Put differently, HMO enrollees have a relatively limited set of providers to choose from because HMOs are selective about providers in an effort to concentrate control. Therefore, the HMO should try to structure a control system for providers including payment systems which yields a pattern of services that reflects what consumers in the market desire.

Likewise, payment systems for physicians have a substantial effect on physician behavior and expenditure associated with physician services. Fee-for-service and capitation as two extreme forms of physician payment systems provide different financial incentives for physicians. Under fee-for-service, physicians can increase their net income by provid-

ing more services as long as the fee is set greater than the marginal cost of services. For physicians paid by fee-for-service, incentives to reduce the cost of providing services evaporate because all incurred costs are reimbursed to them.¹³ Under capitation, however, physicians receive a predetermined amount of capitated payment per period regardless of the actual amount of services provided. In order to maximize net income with fixed revenue, capitated physicians should reduce the quantity of services and minimize costs, although an excessive reduction in the quantity of services can decrease the number of patients in their panels. Payment systems will affect the nature of competition in physician services markets, too. Physicians in more competitive markets may have incentives to induce demand when they are paid by fee-for-service while competition among capitated physicians will not result in demand inducement due to the constraints of fixed revenue. Competition will help to counteract the possible incentives of capitated physicians to reduce the quantity or quality of services. As in the case of hospital payment systems, the mix of fee-for-service and capitation is efficient and provides physicians with incentives to minimize costs without unduly affecting the patient selection and the quality of care they provide (Kwon, 1997). The mixed payment system provides a balance between the incentive for overprovision under fee-for-service and the incentive for underprovision under capitation.

One can view the effect of structuring financial incentives on the provider decision making in the following way. In Figure 1, let D and S denote the usual demand for and supply of medical services, respectively. Assume that there is no patient cost sharing. Patient moral hazard causes the demand curve D to shift outward to D' as the person buys an insurance. If there is no fee scheduling and the government (or insurer) pays the provider what is actually charged--that is, the provider's cost-sharing is zero such as the cost-based reimbursement--then the physician ends up providing q_0 amount of services. Without patient cost sharing, it is difficult to control the patient moral hazard, because the provider has no financial incentive to do so. To provide incentives for the provider to control utilization, one needs to estimate the effect of financial incentives on provider decision mak-

ing (that is, the nature of the relationship $q = q(I)$, with I denoting the structure of incentive or payment systems). Based on the relationship, government (or insurer) will determine the optimum I^* , by changing the effective marginal price faced by the physician, to induce the physician to provide the targeted amount of service q^* to the patient (i.e., $q^* = q(I^*)$). For example, the targeted amount of medical services could be q_1 which is demanded by the patient when no moral hazard has occurred--outcome in the absence of the insurance coverage. This is the strategy of controlling consumer moral hazard by designing effective financial incentives and payment systems for providers.

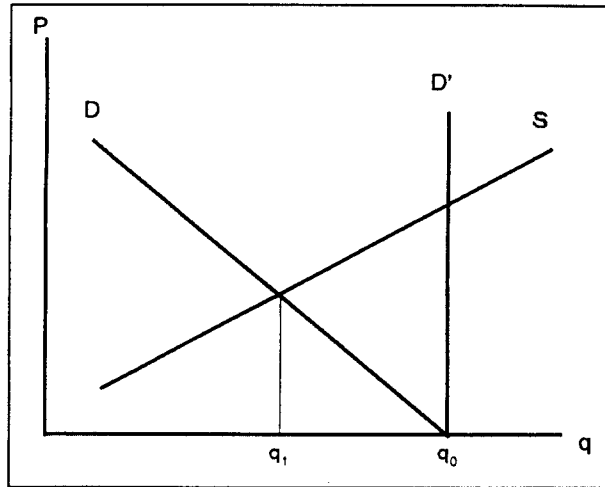


Figure 1. Role of Payment Systems for Providers

V. Summary and Conclusion

Information asymmetry between providers and consumers of medical services leads patients to depend more on the structural measures of health care quality such as medical technology than on the outcomes of health care intervention, which are hard to measure. The lower out-of-pocket price due to health insurance also encourages an excessive demand for health care technology. These unique aspects of health services have resulted in

perverse outcomes of competition among health care providers. Providers' superior knowledge and information have led us to suspect that physicians induce demand for health services to increase their income. Furthermore, hospitals compete to attract physicians and patients by adopting excessive amounts of expensive medical technology when those purchases are fully paid for by insurers under cost-based reimbursement system. Accordingly, hospital competition leading to technological sophistication has been regarded as cost increasing and wasteful. It is now believed that unless the rapid diffusion of health care technology is controlled, ever-increasing health care expenditures cannot be contained.

To encourage socially-beneficial competition leading to cost control, the government can implement several policy options. The government needs to develop and disseminate information about the outcome-based measures of quality of services that each hospital provides. Hospitals have incentives to increase expenditures on new technology as long as consumers perceive highly-specialized services and equipment as high quality. Patients can make rational decisions on the choice of providers and health care utilization if the objective outcome measures of provider performance, such as mortality or improvement in health status, are available. Recently, the effect of financial incentives and payment systems on provider behavior has been recognized in health care markets. Structuring reimbursement systems, for example paying only a prospectively-set amount regardless of the actual supply of services, gives providers strong incentives to reduce the cost of producing medical services. New forms of payment systems also change the nature of competition in health care markets such that hospital services markets are now characterized by cost-reducing competition instead of wasteful quality competition.

Desirable government policy should be a combination of several methods. Regulation of just one area may have perverse effects on others. If the government adopts PPS for inpatient services, hospitals have incentives to increase outpatient services, and as a result the PPS will have a limited effect on cost containment. When PPS is applied only to public insurance, hospitals may raise prices for privately-insured patients (cost shifting). Even though outlays of the public health insurance program are decreased, national

health care expenditures may rise with cost shifting among payers. The objective of cost-containment policy should be to control the total expenditures of the health care system. Furthermore, it should be noted that without government policy to control continuing technological innovation and diffusion, various efforts to contain health care costs may have only a once-and-for-all effect on the level of health care expenditures. This will not change the growth rate of expenditures. A carefully designed payment system is expected to affect research and development for costly medical technology in the long run.

Strategies to design and implement new supply-side incentive systems, such as mixed payment systems, to induce providers to contain health costs without unduly harming access and quality need to be researched in the future. Considering the unique hospital-physician relationships (closed system with physicians as hospital employees), PPS may have detrimental effects on access and quality of care in Korea. The effects of various policy options on provider incentives and their responses, and the resultant implication for health care costs, should be carefully examined. It will be also worthwhile to analyze the effect of increased payment units (such as global budgeting) on the performance of the health care system.

〈Notes〉

1. Prevalence of not-for-profit hospitals is another factor associated with the notion that too much emphasis is given on the quality of care in health care markets. If the quality of services is an element in addition to profit in not-for-profit hospitals' objectives (Newhouse, 1970), quality of care (in both patient outcomes and structural measures) will be higher than that expected from pure profit-maximizing firm behavior. Alternatively, if hospitals are directly controlled by physicians (Pauly and Redisch, 1973), physicians will prefer the extensive use of nonphysician inputs such as high-technology equipment to increase their own productivity, leading to high quality (probably in structural meas-

- ures) in health care markets.
2. Technology in health care includes both physical equipment (e.g., MRI) and procedures and drugs (e.g., open heart surgery or organ transplantation).
 3. Availability of different forms of medical technology also affects the demand for different types and amounts of insurance (Baumgardner, 1991; Weisbrod, 1991). In other words, medical technology and insurance are interdependent.
 4. Newhouse (1992) shows some evidence regarding the effect of technological innovation on the increase in health care cost. For example, intensity of care measured by the real cost of a stay in the hospital rose substantially (by a factor of four) from 1965 to 1986 while admission rates and length of stay were rather stable.
 5. (Cross-sectional) empirical testing of demand inducement suffers from several problems, most importantly, the inability to control for the possible effect on demand shift of the quality change following increased provider supply (e.g., reduced travel cost and physicians spending more time with patients) --“achilles heel” in the inducement issue. For a discussion of other problems of measurement error, omitted variables, and endogeneity bias (i.e., physician supply), see Phelps (1986).
 6. For more general discussions of price distribution under imperfect information, see Stiglitz (1986).
 7. Although the empirical results of Dranove, Shanley and Simon (1992) supported the medical arms race hypothesis of the adoption of more technology in more competitive markets, they also found that population size in the market and service availability in neighboring markets have a significant impact on the local supply of high-technology specialized services. Noether (1988) has found hospital expenses are higher in more competitive, i.e., less concentrated, markets, while hospital prices are not significantly affected by market concentration. She has suggested that the resultant decrease in quality-adjusted price due to competition could imply the existence of some price competition.
 8. There is a view (“capture” theory or the political economy of regulation), however,

which has little faith in government regulation (Stigler, 1971; Peltzman, 1976). According to this theory, occupational licensing is anticompetitive because it raises the entry barrier, and thus increases the economic rents for those professionals. Graddy (1991) has shown that state licensure policies for health professionals are associated with both public interest and professional interests.

9. The rate of inflation of hospital expenses is not reduced after the first two years of PPS implementation, however. Although data limitations make it difficult to analyze PPS performance in recent years, it may be due to higher rate of increase in wages and benefits (Coulam and Gaumer, 1991), dissipation of the windfall profit (resulting from generous payment level) occurred in the first two years of PPS (Hadley, Zuckerman and Feder, 1989), or more or less stabilized LOS and intensity of inpatient care.
10. Another important factor contributing to the changing nature of hospital competition is the emergence of selective contracting by new types of health insurance organizations --namely, aggressive price-shopping insurers such as HMOs (health maintenance organizations) and PPOs (preferred provider organizations). By channeling their enrollees to preferred providers offering discounted prices (with reasonable quality), these insurers have introduced price competition among providers (see, for example, Feldman et al., 1990). The success of selective contracting depends on the market power of those aggressive insurers relative to providers. Unless there exists competition with a sufficient number of hospitals in the market, HMOs or PPOs cannot negotiate lower prices (Melnick et al., 1992). Government policies to facilitate the above types of competitive contract and alternative delivery systems will therefore change the nature of health care competition and reduce expenditures. Furthermore, in those new insurance organizations, especially in HMOs, payment systems also play the very important role in changing physician behavior and reducing cost (Hillman, Pauly and Kerstein, 1989; Kwon, 1996). The vertical integration of financing and delivery of health services makes it possible for those insurers to use various incentive systems for providers. The provider incentive system adopted by those insurers is regarded as one of the most im-

portant factors contributing to their success in controlling expenditures.

11. A controversial issue in the empirical analysis of hospital competition is how to define the hospital market. Possible definitions of the local market includes SMSA (standard metropolitan statistical area) (Joskow, 1980; Noether, 1988), 5 or 15 mile radius around the hospital (Luft et al., 1986; Robinson and Luft, 1985), service-specific market area based on patient flows and zip code (Zwanziger and Melnick, 1988), and the urbanized area (Dranove, Shanley and Simon, 1992; Dranove, Shanley and White, 1993). For more discussions on this issue, see Dranove and Shanley (1989) and Luft et al. (1989).
12. It is worth noting that most of OECD countries adopt annual prospective budgets for operating and capital costs of hospitals (OECD, 1987).
13. Pauly (1980) argues that the problem of too much care is caused not by the fee-for-service system itself but by the deviation of the actual fee from the optimal fee level. But it is extremely difficult for the government to set the fee at the optimal level where the supply curve intersects the true demand curve (assuming full information).

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