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Information disclosure and the equivalence of prospective payment and cost reimbursement

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ABSTRACT

A health care provider chooses unobservable service-quality and cost-reduction efforts. The efforts produce quality and cost efficiency. An insurer observes quality and cost, and chooses how to disclose this information to consumers. The insurer also decides how to pay the provider. In prospective payment, the insurer fully discloses quality, and sets a prospective payment price. In cost reimbursement, the insurer discloses a value index, a weighted average of quality and cost efficiency, and pays a margin above cost. The first-best quality and cost efforts can be implemented by prospective payment and by cost reimbursement. Cost reimbursement with value index eliminates dumping and cream skimming. Prospective payment with quality index eliminates cream skimming.

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1. Introduction

The (provocative) title refers to prospective payment and cost reimbursement, the most common mechanisms for paying health care providers. In prospective payment, a provider receives a fixed price for delivering a medical service, irrespective of resources used. In cost reimbursement, a provider receives a revenue corresponding to resources used.[1] These two payment methods have been studied extensively and intensively in the past thirty years. The conventional wisdom is that prospective payment and cost reimbursement give rise to different quality and cost incentives. In this paper, we describe a model in which prospective payment and cost reimbursement can give rise to identical quality and cost incentives. This model differs from the conventional one only in how consumers learn about quality.

The canonical model is this. A health care provider chooses unobservable quality and cost-reduction efforts, and incurs disutilities in doing so. The efforts produce quality and reduce costs. A higher quality results in a higher variable cost and attracts more consumers, but a higher cost effort reduces the variable cost. An insurer wants to implement socially efficient quality and cost efforts.

Under prospective payment, the provider internalizes the production cost, so its cost-reduction incentive is aligned with social cost efficiency. An appropriate prospective payment level may then be chosen to align the provider's profit motive with

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[1] For our purpose, cost reimbursement is the same as conventional fee-for-service: a provider chooses medical services to supply, and receives a fee that amounts to the cost and a profit margin. Prospective payment may be supplemented by outlier compensations, local-market adjustments, etc. These variations are unimportant here.

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social quality efficiency. Prospective payment kills two birds with one stone. Cost reimbursement works in a perverse way. Because all variable costs will be reimbursed, the provider lacks any incentive to expend cost effort. The quality incentive can still be implemented by paying the provider a margin above cost for services rendered. The provider raises quality to attract more consumers because of the profitable margin.

In the two payment systems, the common principle is demand response: higher quality raises demand, so a higher profit margin incentivizes quality effort. However, the provider internalizes costs under prospective payment, but does not do so under cost reimbursement.

A demand response requires consumers to know about quality, which is commonly assumed. However, health care quality information can be difficult to obtain and interpret. Indeed, insurers, governments and sponsors increasingly have helped consumers find out about quality.[2] In this paper, we make an alternative assumption about information structure. We assume that consumers cannot observe quality directly, but the insurer can. The insurer can also observe costs. We set up an implementation problem; the insurer would like the provider to choose first-best quality and cost efforts, which are hidden actions, by information disclosure and payment incentives.

We prove two main results. First, first-best efforts can be implemented by prospective payment and full disclosure of quality, so we reaffirm a result of the canonical model. Second, and this is the surprise, first-best efforts can be implemented by cost reimbursement and partial disclosure of quality and cost. Partial information disclosure refers to a *value index*. A provider's unobservable efforts produce quality and cost efficiency (cost saving from a benchmark). For any quality and cost produced, the insurer constructs a weighted average and discloses this average—the value index—to consumers. We show that mixing quality and cost efficiency information can incentivize cost effort.

Why is there cost incentive under cost reimbursement when a value index about quality and cost is disclosed to consumers? Consumers only observe the value index, not quality, so they will draw inference about quality based on the value index. A given level of value index corresponds to some inferred quality level, which generates a demand. Consumers' belief about quality is based on the value index, not the actual quality effort. Hence, changing efforts that would maintain the index would leave demand (and revenue) unaffected. It follows that the provider must choose disutility-minimizing efforts to achieve an index.[3] Furthermore, the insurer can choose the index weight and profit margin to make the provider internalize the net social benefit of quality and cost efforts.

Starting with the basic model, we then consider more complex environments. In one extension, we consider dumping of high-cost consumers. Under prospective payment, the provider takes a loss when treating high-cost consumers whose costs are higher than the price, so will refuse to serve them. We show that dumping can be avoided under cost reimbursement, because cost variations will be absorbed by the insurer. Implementation of first-best efforts is possible under cost reimbursement, but not under prospective payment.

In another extension, we study cream skimming when health services have multiple qualities. Cream skimming refers to the overprovision of more profitable qualities and the underprovision of less profitable qualities. We illustrate how prospective payment and full disclosure create cream skimming incentives. We then show that under both prospective payment and cost reimbursement, the insurer can use partial disclosure to neutralize the provider's cream skimming incentives.[4]

It has not escaped our notice that our theory relies on the provider being unable to credibly disclose quality information. If a provider were able to do so, it could defeat the value-index manipulation. In practice, there does not seem to be any "danger" that any provider could fully disclose quality information. Otherwise, public agencies (such as *the Centers for Medicare and Medicaid Services*) and nonprofit organizations (such as *Consumer Reports* and *the National Committee for Quality Assurance*) would not have expended huge resources to make quality reports available to the general public. Furthermore, it is far from clear that a provider would honestly report quality information even when it was feasible to do so.

1.1. Literature

The literature on provider payment design is large. For surveys, see Newhouse (1996), McGuire (2000), and Leger (2008). Ma (1994) lays out the basic model of payment systems and their effects on health care quality and cost incentives. The general consensus is that cost reimbursement fails to achieve cost efficiency, and that prospective payment leads to perverse selection incentives such as dumping and cream skimming. Generally, neither cost reimbursement nor prospective payment achieves socially efficient outcomes.

We assume a demand response: consumers' demand for services reacts positively to quality, an assumption commonly adopted in the literature: see for example, Rogerson (1994), Ma and McGuire (1997), Frank et al. (2000), Glazer and McGuire (2000), Brekke et al. (2006).[5] Recent papers empirically evaluate demand response to public reports. In commercial

[2] For a summary of empirical works on public reporting initiatives, see Dranove and Jin (2011).

[3] An "agency" explanation in line with the Mirrless-Holmstrom model goes as follows. An agent (the provider) chooses unobservable inputs (efforts) that produce two outputs (quality and cost efficiency). Consumer demand is based on one output (quality), but consumers observe nothing. The principal (the insurer) observes the two outputs, and (credibly) reports to consumers a weighted average. Belief on quality output depends only on the index. The agent's equilibrium efforts must minimize the disutility for achieving the index.

[4] Prospective payment also encourages "fraudulent" upcoding. For example, *Medicare* uses the Diagnostic Related Group system to set prices. If an illness fits into more than one diagnosis (perhaps due to severity differences), a provider may choose to report the one with a higher price (Dafny, 2005).

[5] One exception is Chalkley and Malcomson (1998). In their model, a capacity-constrained provider is motivated by altruism rather than demand response.

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