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Quality disclosure and the timing of insurers' adjustments: Evidence from medicare advantage☆

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ABSTRACT

Mandatory quality disclosure often includes a period over which the quality of new entrants is unreported. This provides the opportunity for forward-looking firms to adjust product characteristics in advance of disclosure. Using comprehensive data on Medicare Advantage (MA) from 2007 to 2015, I exploit the design of the MA Star Rating program to examine the presence of forward-looking behavior among insurers. I find that high-quality insurers reduce prices leading up to quality disclosure, while low-quality insurers increase prices in advance of quality disclosure. These dynamics are consistent with firms anticipating a future change in consumer inertia and updating current-period prices accordingly.

1. Introduction

Consumers have access to a variety of quality measures when making purchasing decisions. Such quality measures derive from several sources, including self-disclosed quality via advertising and other brand management strategies, customer word-of-mouth and aggregated reviews from individual users (as published on Google, Yelp, Rotten Tomatoes, etc.), third-party quality disclosure such as *Consumer Reports*, *U.S. News & World Report*, and other rating entities, and direct government regulation in the form of mandated disclosure or licensing. Consumers may also rely on their own personal experience in gauging product quality. How these sources of information influence consumer and firm decision making is the subject of a large theoretical and empirical literature (Dranove and Jin, 2010).

In this paper, I exploit the design and timing of quality disclosure in the Medicare Advantage (MA) rating system to examine the effect of *anticipated* quality disclosure on firm behaviors. My central question is whether insurer's adjust plan prices in advance of mandatory quality disclosure. As a prerequisite for such behavior, quality disclosure must convey some information to consumers, and there must be some persistence in market shares over time. My analysis therefore first demonstrates that these prerequisites are satisfied in the MA market. The analysis then turns to estimating insurer pricing behavior leading up to the publication of their quality ratings.

The MA market is well-suited to examine these questions due to the complexity of health insurance plans, the subsequent importance of quality information to consumer decisions (Hibbard et al., 1998; Abaluck and Gruber, 2011), and recent changes in this market to better disclose plan quality. Moreover, in the MA quality rating system currently in use by the Centers for Medicare and Medicaid Services (CMS), quality disclosure is involuntary and fully anticipated by the firms. This type of rating system is also used in many other healthcare markets, including nursing homes, dialysis clinics, hospital and physician report cards, and potentially to health insurance plans operating on the exchanges as part of the Affordable Care Act (ACA). Results based on the MA market may therefore inform policy in these other areas.

The MA market is also a large and growing component of the U.S. healthcare system, with 19 million individuals (33% of the Medicare population) currently enrolled in an MA plan for their health insurance benefits.[1] In a broader healthcare context, understanding the influence of quality measures on consumer and firm behaviors is critical as we move from a "volume-based" to a "value-based"

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[1] This reflects a three-fold increase since the Medicare Modernization Act of 2003. Kaiser Family Foundation MA Update, available at http://kff.org/medicare/fact-sheet/medicare-advantage-fact-sheet/.

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healthcare system. In this value-based system, reimbursement is tied at least in-part to quality, and this necessarily requires systematic and mandatory quality measures.

Using market-level data on MA enrollments, county demographics, CMS benchmark and payment data, and characteristics of the local hospital market, my analysis first estimates the demand-side response to quality disclosure using a nested logit demand model of differentiated products following Berry (1994). The dependent variable in these models is a plan's log market share relative to the log market share of traditional Medicare fee-for-service (FFS), which serves as a common outside option for all Medicare eligibles in all markets. Within this structure, I estimate the effects of nondisclosure in two ways. First, I consider a standard difference-in-difference (DD) approach, where the control group consists of MA contracts beyond their second year of operation, the treatment group consists of contracts within the first two years of operation, and the pre-post periods are delineated by the introduction of the overall MA star rating program in 2009.[2] Second, I estimate fixed effects models in which contracts without quality ratings in the current period but who ultimately received a star rating, s, are compared to contracts with a disclosed rating of s in the current period. In this analysis, MA contracts are compared based on quality, but contracts in one group have not yet had their quality rating revealed to the market. The details of the identification strategy and sensitivity analysis exploit several unique aspects of the MA quality rating program, which I discuss in more detail in Section 3.

Consistent with the demand-side literature, I find a significant effect of quality ratings on enrollment, with low-quality plans benefitting from nondisclosure. Specifically, conditional on plan premiums, plans with an undisclosed star rating of less than 3 stars tend to enroll approximately 78 additional beneficiaries per month due to nondisclosure of quality, while plans with an undisclosed star rating of 4 or above receive about 280 fewer enrollments per month on average due to nondisclosure. Since high-quality contracts tend to locate in larger markets, these estimates are based on 37,900 eligible beneficiaries per county among low-quality contracts and around 40,400 eligible beneficiaries per county among high-quality contracts. Note also that my estimates speak to the effect of quality disclosure rather than the effect of increasing the quality score as estimated in Reid et al. (2013) or Darden and McCarthy (2015).

As discussed in more detail in Section 2, observing a response to *anticipated* quality disclosure requires not only that consumers are responsive to quality disclosure, but also that there exists some persistence in market shares over time. The health insurance market, and particularly the complexity of the Medicare Advantage market, is a natural setting in which to expect these mechanisms are at play. I examine the presence of share persistence directly in the MA market and indeed find evidence of persistence in MA shares over time. I also find evidence of differential changes in share persistence following quality disclosure, where share persistence increases among contracts disclosed as high quality and decreases among contracts disclosed as low quality.

I then examine changes in plan bids and premiums prior to quality disclosure. Each of these supply-side responses speak to a firm's pricing behavior in anticipation of their quality being revealed to the market. The results suggest important differences between low- versus high-quality contracts with regard to their response to future quality disclosure. Low-quality contracts (below 3-stars) appear to take advantage of nondisclosure of quality with higher bids and higher premiums in periods prior to quality disclosure, while higher quality contracts raise bids and premiums after quality is fully disclosed.[3] These dynamics are consistent with a differential change in share persistence, with low-quality contracts anticipating a reduction in share persistence and high-quality contracts anticipating an increase in share persistence following quality disclosure.

Estimating differential responses to quality disclosure inherently requires some measure of pre-disclosure quality. As discussed in Section 3, star ratings are calculated based on data from one to two years prior to the upcoming open enrollment period, such that the disclosed rating at time t is arguably fixed as of $t-1$ and somewhat fixed even at $t-2$. My identification strategy exploits this institutional detail by using the contract's first disclosed star rating as a measure of pre-disclosure quality. In Section 6.4, I assess the sensitivity of this strategy with an alternative analysis in which I focus only on contracts with constant star ratings over a two-year period, where I find similar results. I therefore argue that the estimated effects of future disclosure are indeed driven by anticipated quality disclosure rather than an insurer's uncertainty over the underlying quality rating or short-term changes in quality for the same contract.

My analysis contributes broadly to the literature on quality disclosure and consumer/firm behavior, and specifically to the literature on quality disclosure in health insurance markets (Beaulieu, 2002; Chernew et al., 2008; Dafny and Dranove, 2008; Darden and McCarthy, 2015; Jin and Sorensen, 2006; McCarthy and Darden, 2017; Reid et al., 2013; Scanlon et al., 2002; Spranca et al., 2000; Stockley et al., 2014; Wedig and Tai-Seale, 2002).[4] The majority of this literature focuses on demand-side responses or the effects of improvements in reported quality. This paper instead acknowledges that firms may be more forward-looking, anticipating their future quality disclosure, rather than responding to observed changes in existing ratings. This is an important distinction as the announcement of mandatory quality reporting programs may influence firm behaviors prior to quality measures being fully revealed.

2. Conceptual motivation and pricing

To motivate the examination of anticipated quality disclosure, consider an existing firm j seeking to maximize the expected discounted present value of its profits in market m, which I assume is additively separable across geographic markets (Bresnahan and Reiss, 1991; Cawley et al., 2005; Abraham et al., 2007; Ericson, 2014; Einav and Levin, 2015; Curto et al., 2015). In practice, MA insurers first submit bids to CMS, denoted $b_{c(j)t}$, where $c(j)$ denotes plan j operating within contract c. CMS compares these bids to the benchmark payment rate in each market, denoted B_{mt}. For $b_{c(j)t} < B_{mt}$, CMS pays the insurer the risk-adjusted bid for each enrollee, which I denote by $\alpha_i \times b_{c(j)t}$. CMS also pays these insurers a percentage of the difference between the bid and benchmark in the form of a rebate, denoted $\gamma_{c(j)t}$;[5] however, rebates must be

[2] Once the overall star rating program is in place in 2009, contracts in their first two years are deemed "too new" for a star rating. I therefore identify treatment and control groups based on the age of the contract in order to maintain a treatment and control group assignment in the both the pre- and post-periods.

[3] Hirth and Huang (2016) similarly find that the publication of quality star ratings for nursing home facilities caused highly rated nursing homes to raise their prices by over $3.

[4] The potential for supply-side responses to MA policy has received relatively little attention from researchers. Recent exceptions include Song et al. (2013), Cabral et al. (2014), Stockley et al. (2014), Curto et al. (2015), and Duggan et al. (2016), who examine how MA plans respond to changes in MA benchmark payments. McCarthy and Darden (2017) also consider the supply-side response to quality ratings, focusing on the response to changes in reported quality rather than the effect of quality disclosure.

[5] Since 2012, the benchmark rates were adjusted based on the contract's star rating, with contracts of 4 stars or more receiving a 5% increase in their benchmark