How do health insurer market concentration and bargaining power with hospitals affect health insurance premiums?

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ABSTRACT

The US health insurance industry is highly concentrated, and health insurance premiums are high and rising rapidly. Policymakers have focused on the possible link between the two, leading to ACA provisions to increase insurer competition. However, while market power may enable insurers to include higher profit margins in their premiums, it may also result in stronger bargaining leverage with hospitals to negotiate lower payment rates to partially offset these higher premiums. We empirically examine the relationship between employer-sponsored fully-insured health insurance premiums and the level of concentration in local insurer and hospital markets using the nationally-representative 2006–2011 KFF/HRET Employer Health Benefits Survey. We exploit a unique feature of employer-sponsored insurance, in which self-insured employers purchase only administrative services from managed care organizations, to disentangle these different effects on insurer concentration by constructing one concentration measure representing fully-insured plans' transactions with employers and the other concentration measure representing insurers' bargaining with hospitals. As expected, we find that premiums are indeed higher for plans sold in markets with higher levels of concentration relevant to insurer transactions with employers, lower for plans in markets with higher levels of insurer concentration relevant to insurer bargaining with hospitals, and higher for plans in markets with higher levels of hospital market concentration.

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1. Introduction

The US healthcare industry has become increasingly consolidated. While the wave of hospital mergers in the 1990s gave way to numerous studies of the implications of hospital consolidation, newfound attention in recent years has focused on consolidation in the US health insurance industry. Robinson (2004) documents the increasing concentration of these markets over the first half of the 2000s, as well as the predominance of insurance markets dominated by a small number of large, nationwide insurers. Similarly, a report from the American Medical Association (2013) highlights the preponderance of health insurance markets across the country that are highly concentrated, as defined by the standards set forth by the Department of Justice (DOJ) and Federal Trade Commission (FTC) in their Horizontal Merger Guidelines (2010).

This increased level of interest in insurer concentration is warranted for several reasons. Understanding the effects of these high levels of market concentration and their implications for premiums is valuable generally, but particularly so for an industry facing such high and rapidly rising premiums. Further, there are a number of policy provisions included in the 2010 Patient Protection and Affordable Care Act (ACA) that have important implications for the level of competition in the US health insurance industry. The creation of health insurance exchanges and the inclusion of variant forms of health insurers (such as CO-OP plans and nonprofit plans directed by Office of Personnel Management) as competitors alongside more traditional insurers are examples of ACA provisions targeted toward increasing competition in the private health insurance industry.

However, the ultimate effect of the level of health insurance concentration on health insurance premiums is not straightforward, because there are potentially offsetting effects of the level of insurer competition on premiums. On one hand, higher levels

of insurer concentration should lead to increased insurer market power in the markets where insurance is sold (to employers and individuals), likely resulting in relatively higher premiums due to higher plan profit margins, all else equal. On the other hand, insurers also engage in bilateral bargaining over transaction prices with providers, one of the key drivers of insurer costs. Thus, higher levels of insurer market concentration may yield stronger insurer bargaining leverage with local providers, thereby enabling them to negotiate lower provider prices, which may partly be passed on to insurance purchasers in the form of lower premiums. This purchasing power effect is particularly important, given the recent movement toward increased consolidation among provider markets driven by the ACA and other trends (Cutler and Scott Morton, 2013).

Moreover, the effects of insurer market power may depend on the amount of provider market power, and vice versa. The extent to which insurers can use their bargaining leverage to negotiate lower provider prices likely depends on the level of competition in the local provider market, as these prices may already be at or near the point at which economic profits are zero in relatively competitive provider markets. Furthermore, the extent to which hospitals can use their bargaining leverage likely depends on local insurance market conditions. A better understanding of the extent to which higher prices resulting from concentrated provider markets are passed through to consumers in the form of higher premiums (rather than simply representing a transfer of rents from insurers to providers) is particularly relevant for antitrust enforcement in terms of evaluating the extent to which hospital market consolidation ultimately harms consumers.[2]

1.1. Our empirical contribution

In this paper, we empirically analyze the relationships between insurer concentration, hospital concentration, and employer-sponsored health insurance premiums. Our primary empirical contribution is that we identify a way to disentangle insurer concentration's differing effects on higher insurer profits and lower provider prices. We do so by exploiting a unique feature of the market for employer-sponsored insurance whereby smaller employers tend to purchase fully-insured coverage whereas larger employers tend to self-insure and purchase only administrative services from managed care plans (such as provider network assembly and claims processing). An insurer's market share in the fully-insured market is mainly relevant to the plan's profits, while an insurer's market share in the fully-insured and self-insured markets combined is mainly relevant to provider prices.

More specifically, we construct two distinct measures of health insurance market concentration to disentangle these two effects. Both concentration measures use the HealthLeaders-InterStudy census of private insurers to construct Herfindahl-Hirschman Indices (HHI) of market concentration, and we consider HHIs alternatively using Core-Based Statistical Areas (CBSA), with the Metropolitan Divisions therein, and counties as the geographic market boundaries. One HHI market concentration measure focuses on the profit portion of the premium's administrative overhead tied to the transactions between fully-insured plans and employers by only using HealthLeaders-InterStudy's fully-insured plans in its HHI's market share calculation. We hypothesize that, all else equal, concentration in the fully-insured market will be associated with relatively higher health insurance premiums.

The second HHI market concentration measure focuses on the hospital price's portion of the premium tied to the negotiations between insurers and hospitals. While self-insured enrollment represents a distinct product that is sold to employers, the insurer's patient volume across the entire combined "book of business" (i.e., the fully-insured market and the self-insured market) represents its market share relevant to the price negotiations with hospitals. We therefore use these HealthLeaders-InterStudy data to measure each plan's fully-insured and self-insured combined market share in this HHI calculation representing insurer bargaining with providers. We hypothesize that concentration in the fully-insured and self-insured markets combined will be associated with relatively lower health insurance premiums. (We also hypothesize that higher hospital market concentration – derived from the American Hospital Association's (AHA) Annual Survey – will be associated with relatively higher health insurance premiums.)

Using plan-level premium data from the restricted-use Kaiser Family Foundation/Health Research and Educational Trust (KFF/HRET) Employer Health Benefits Survey for years 2006 through 2011, we find that premiums are indeed higher among markets with higher levels of insurer concentration representing fully-insured coverage sold to employers (and higher among more concentrated hospital markets), and we find that premiums are indeed lower among markets with higher levels of insurer concentration representing insurer bargaining with hospitals (derived from combined fully-insured and self-insured market shares).

Regarding the organization of the remainder of the paper, we first summarize the relevant literature on the effects of insurer and hospital concentration and then describe the conceptual framework. We then explain our empirical model, data, and market definitions. Our results, discussion, limitations, and conclusions follow.

2. Relevant literature

The majority of studies related to competition in the US healthcare industry over the past few decades have focused on competition and consolidation among hospitals. Gaynor and Vogt (2000), Vogt and Town (2006), and Gaynor and Town (2011, 2012) provide excellent reviews of this literature. While many of these studies yield unique findings, the results generally suggest that increasing consolidation in the hospital industry is associated with higher hospital prices.

The literature on the association between insurance premiums and the level of competition in the US health insurance industry, particularly within the employer-sponsored market, is more limited, largely due to data limitations. Early studies by Wholey et al. (1995) and Dranove et al. (2003) find that markets with more HMO competitors are associated with lower premiums. Dafny (2010) finds evidence of price discrimination as a consequence of insurer market power. Using a proprietary dataset containing information about the insurance benefits offered by large employers between 1998 and 2005, she utilizes variation in the profitability of these large employers to illustrate that insurers in concentrated insurance markets impose higher premium increases on more profitable employers (assumed to be less price sensitive). Dafny et al. (2012) observe a positive effect of insurer consolidation on health insurance premiums by exploiting the 1999 merger of nationwide insurers Aetna and Prudential as a source of differential changes in local insurance market concentration across the country. Using this instrument and the same dataset of large employers as above, they find a significant effect of increases in local insurance market concentration on increases in health insurance premiums. Additionally, they explore the possible effects of insurance consolidation on bargaining power with providers, finding that

increased insurance concentration is associated with a substitution of nurses for physicians. Similarly, Dafny et al. (Forthcoming) exploit United Healthcare's uneven impact of its non-participation in state exchanges to conclude that more concentrated insurance exchanges were associated with higher premiums in 2014.

Numerous recent studies document the significant inter- and intra-market variation in negotiated provider prices, including its association with market-level factors, such as insurer or hospital market concentration (for example, White et al., 2013; Berenson et al., 2012; Ginsburg, 2010; MedPAC, 2009; Massachusetts Attorney General, 2010; US GAO, 2005). Several recent papers examine the relationship between both insurer and hospital concentration and negotiated hospital prices. McKellar et al. (2013) and Moriya et al. (2010) both find that higher levels of insurance concentration are associated with lower hospital prices, but that higher levels of hospital concentration are not significantly associated with higher hospital prices. However, Melnick et al. (2011) find that higher hospital concentration is indeed associated with higher hospital prices, and also find that hospital prices are lower in the most concentrated health plan markets compared to more competitive health plan markets. Ho and Lee (2013) find heterogeneous effects of insurer competition on negotiated hospital prices; while increased insurer competition actually reduces hospital prices on average, they observe a positive and significant effect on the prices negotiated by the most attractive hospitals.[3]

Similar effects have been documented among physician markets. Schneider et al. (2008) find that higher physician concentration is associated with higher prices but find no effect of insurer concentration on prices, while Dunn and Shapiro (2012) find that physician prices are higher in concentrated physician markets and lower in concentrated insurance markets. Additionally, Dunn and Shapiro (2013) find that negotiated physician prices increased as a result of health reform in Massachusetts, including some evidence suggesting that these price increases are at least partly attributable to increased competition among insurers. However, the outcome of interest in each of these studies is the prices negotiated between insurers and providers, leaving open the question of whether and, if so, the extent to which such prices are ultimately passed through to consumers in the form of higher premiums.

In perhaps the most closely related paper to our study, Town et al. (2006) analyze the effects of hospital industry consolidation in the 1990s on HMO premiums. They derive a theoretical model demonstrating the effects of horizontal mergers in upstream markets on consumer prices in downstream markets, and apply this model to the hospital (i.e., the upstream input to the product of health insurance) and health insurance (i.e., the downstream output) industries. Their theory predicts that the effects of consolidation in the upstream industry will have differential effects on the price and quantity of the downstream product dependent on the level of competition in the downstream product industry, and their empirical findings support this theory. Specifically, they find that the hospital mergers that occurred in the 1990s resulted in higher HMO premiums and reductions in insurance coverage, and that these effects were strongest among competitive insurance markets.

3. Conceptual framework for premiums

Premiums set by insurers for a given employer represent a combination of expected medical spending covered by the insurer and a loading factor. The loading factor reflects the insurer's administrative costs (such as marketing and paying claims) and any possible mark-up in the profit margin resulting from the insurer exercising market power in selling the insurance policy. Expected medical spending is a function of prices and quantities of medical care to be consumed. Prices generally represent the outcome of negotiations between insurers and providers, and the expected quantity of healthcare consumed generally reflects the generosity of the plan and the health status and other features of the group covered.[4]

As noted above, an increase in the level of concentration in the insurance market likely has offsetting effects on premiums as market concentration may differentially affect the loading and expected spending components of the premium. Regarding the loading component of the premium, the most straightforward effect of increasing insurance market concentration is the likely positive effect on loading as the insurer gains more market power and attains higher profit margins on policies sold to employers.[5] However, higher levels of insurer market concentration may potentially yield efficiencies in certain administrative costs such as lower advertising costs and an increased ability to spread certain fixed costs over a larger population. Would an insurer with increased market power ever pass any portion of these saving in administrative costs along to consumers in the form of relatively-lower premiums? Consider the extreme case of one monopolist insurer setting the price of the premium such that its marginal revenue (from selling an additional policy) equals its marginal cost. Unless the aggregate demand for insurance is completely inelastic, any decrease in the marginal cost (from administrative efficiencies via larger market share) implies a partial decrease in the premium (to thus reduce marginal revenue in equilibrium). That said, the overall effect of increased market concentration would seem to likely increase premiums, with the partial effect of increased profits on higher premiums exceeding the partial effect of reduced administrative costs on lower premiums, unless the aggregate demand for insurance is highly elastic.

Regarding the expected spending components of the premium, increased insurance market concentration may also result in lower healthcare spending, as the insurer gains stronger bargaining leverage with hospitals and is able to negotiate lower payment rates. However, the extent to which these lower provider prices attained by an insurer are passed along as savings to consumers in the form of lower premiums is also unclear. Similar to the

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[3] Several other papers also focus on the effect of the type of hospital with respect to negotiation between hospitals and insurers (which we do not consider in our empirical analysis). Ho (2009) develops a sophisticated model of the insurer-hospital bargaining game, estimating the expected division of profits between insurers and hospitals. She finds that specific hospital features have important effects on the outcome of this bargaining game – that "star" and capacity constrained hospitals have stronger bargaining leverage with insurers and higher profits. This result is also documented by Berenson et al. (2012) who, using data from qualitative interviews with hospital and insurance executives from the Community Tracking Study, find that "must-have hospital systems. . .can exert considerable market power to obtain steep payment rates from insurers." Lewis and Pflum (2014) also find that multi-market participation by a hospital system may increase bargaining leverage.

[4] Quantity consumed is also a function of the price; however, here we are focusing on prices in terms of total transaction price negotiated with the hospital by the insurer. Given the presence of insurance coverage, the portion of this price faced by the consumer seeking medical care is likely to be considerably smaller than this negotiated transaction price, so the price effects would likely reflect the change in consumer cost-sharing, rather than the change in overall price. In a similar paper which disentangles the price and quantity effects on physician services consumed, Dunn and Shapiro (2012) find very small price effects on quantity consumed in this state of insurance coverage. Additionally, McKellar et al. (2013) find that, despite an inverse correlation between market-level private prices and utilization, overall the price effect dominates, resulting in a positive relationship between prices and spending.

[5] Competitive pressures on insurers could also lead to improvements in quality for the insurance plan, holding spending constant, although Scanlon et al. (2008) find no evidence to support competition's effect on quality.

above consideration of reduced administrative costs, a reduction in negotiated provider prices is essentially a downward shift in the insurer's marginal cost curve. If the price elasticity of demand for insurance is completely inelastic, all of the savings from lower provider prices paid by the insurer would be retained by the insurer as higher profits. Otherwise (unless the price elasticity is extremely high), a portion of the savings from lower provider prices would likely be passed on to consumers as lower premiums (tied with the desire to sell more policies)[6] while a portion of the savings from lower provider prices would be retained by the insurer as a higher profit margin.

Conversely, as hospital markets become more concentrated, hospitals may gain stronger leverage in the bargaining game with insurers, resulting instead in higher premiums via increased spending due to higher negotiated payment rates to hospitals. Moreover, as hospital markets become more competitive, the effect of insurer concentration may have a negligible impact on hospital prices if those prices cannot be negotiated downwards any further by insurers due to hospital solvency constraints.

As a result, the relative magnitudes of these potentially offsetting effects of increasing insurance concentration on health insurance premiums are not clear. Our study therefore aims to empirically isolate some of these potentially countervailing effects of health insurance concentration, and their interaction with local hospital market concentration, on health insurance premiums in the employer-sponsored insurance market.

4. Empirical model and data

4.1. Empirical overview

We run plan-level OLS regressions to test the relationship between insurer and hospital market concentration and employer-sponsored fully-insured premiums from the KFF/HRET Employer Health Benefits Survey from 2006 through 2011. These models use the logged single-employee's total annual premium (i.e., the employer and employee shares combined) as the dependent variable of interest and include plan, firm, industry, and market-level controls for premiums. Our model uses continuous HHI measures for insurer and hospital market concentration and, as noted above, incorporates two separate measures of insurance market concentration to disentangle the effects of insurer market concentration in the market for selling fully-insured coverage to employers from those effects of insurer market concentration in the market for bargaining over service prices with hospitals.

An important limitation of our analysis is that we ultimately rely on cross-sectional geographic variation in these market concentration measures for both insurers and hospitals, and thus the endogeneity of these market concentration measures is a potential concern. A good instrument for cross-sectional variation in market concentration is simply not apparent to us. Many studies therefore use variation over time in these market concentration measures, but we think that firm decisions to merge with one another are also likely endogenous to market characteristics themselves. Regardless, there is very little within-market variation over time in either the insurer HHIs or the hospital HHIs during this 2006 through 2011 time period for our premium data. (Despite this lack of variation over time, we tested models including market-level fixed-effects

models anyway, but these models yielded insignificant results.) Our prior is that exogenously-high insurer profits would increase insurer competition and exogenously-high hospital prices would increase hospital competition, leading to a bias against observing our hypothesized positive effects of HHIs on premiums.

4.2. Data

We obtain data on employer-sponsored health insurance premiums from a restricted-use version of the annual KFF/HRET Employer Health Benefits Survey for 2006–2011. (The public-use version of this dataset does not have geographic identifiers.) The KFF/HRET survey provides nationally representative data regarding employers' health benefits offerings for roughly 2000 firms per year. The data include plan-level information on the largest plan of each type of plan (i.e., HMO, PPO, etc.) offered by the employer in the year. We obtain plan-level premiums, type of plan, and generosity factors such as deductible and out-of-pocket maximum information from these data and focus our regression analyses on single coverage. We also include firm-level control variables from these data including firm industry, size, unionization, and workforce characteristics. We restrict our analysis to employers purchasing fully-insured coverage by excluding self-insured employers. We also exclude rural employers from our analyses, as we ultimately link these data to market concentration measures constructed for urban markets. Finally, we exclude observations with premiums in the highest and lowest one percentile of the distribution of the data.

We also include time-variant market-level control variables in these premium regressions. These include mean per capita income at the CBSA-level, which we obtain from the Bureau of Economic Analysis, and the age, sex, and race-adjusted mean annual Medicare hospital reimbursement per enrollee at the HRR-level, obtained from the Dartmouth Atlas of Health Care, which we include to control for local variation in practice patterns that would be expected to affect utilization and therefore premiums. Additionally, we control for state-level premium tax rates and an index of high-cost state-mandated benefits,[7] both of which may increase premiums for fully-insured coverage. We use a one year lag for all market-level variables, except the premium tax rates and mandated benefit index, which are contemporaneous (though highly invariant over the time period studied).

4.3. Market definitions

We construct HHI measures of insurance market concentration from the HealthLeaders-InterStudy census of private insurers and subsequently merge these market concentration measures to the KFF/HRET data.[8] The HealthLeaders-InterStudy data include enrollment at the managed care organization (MCO)-product-county-level for each year.[9] We construct two distinct measures

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[6] In the presence of adverse selection, insurers may also pass on savings in the form of lower premiums in an effort to attract a healthier risk pool. For example, Starc (2014) shows that medical spending is positively associated with premiums in the Medigap market and that adverse selection in this market somewhat restrains insurer premium markups despite insurer market power.

[7] The index is constructed by summing the number of high cost benefit mandates in effect for the given year in the state in which the policy is sold. "High cost" mandates are defined as those for which associated healthcare spending is estimated to be more than 1% of overall premium by the Council for Affordable Health Insurance (2006–2011).

[8] The HHI is the sum of the squared market shares of each competitor in the market, and is a commonly used measure of market competitiveness in horizontal merger analyses conducted by the DOJ and FTC. The measure ranges from 0 to 10,000 with 10,000 representing a perfect monopoly. We scale this by 100 points (such that the HHI ranges from 0 to 100) in all of our regression analyses for easier presentation of results.

[9] The InterStudy data have been criticized for work on health insurance markets due to concerns with accuracy and consistency (see, for example, Dafny et al., 2011). One important point to note is that earlier criticisms of the

of insurance market concentration based on the market shares of the relevant transaction.

For the market transaction in which the insurer sells fully-insured coverage to employers, we define the product market as all fully-insured managed care insurance products and aggregate the MCO's enrollment in these products within a defined geographic market (described below). We refer to this measure as the "Insurer:Employer HHI" representing the level of competition of the market in which the employer is purchasing a fully-insured managed care product to provide coverage for its employees.

For the market transaction in which the insurer uses its bargaining leverage to negotiate with hospitals, we define the insurance product market by aggregating each insurer's enrollment in a geographic market for its entire commercial book of business (i.e., combined enrollment in fully-insured and self-insured managed care products) because that full set of commercially insured patients represents that insurer's purchasing power. We refer to this measure as the "Insurer:Hospital HHI" measure. We exclude observations in markets in which the HealthLeaders-InterStudy data provide implausibly high, low, or variant total enrollment.

To construct the measure of market concentration for hospital services, we use data from the AHA annual survey. We include all non-federal short-term general acute care hospitals in the US. We define the product market as the number of private-pay inpatient days aggregated to the hospital system within the geographic market.[10] This concentration measure, referred to as "Hospital HHI" represents the relative bargaining strength of the local hospital market with which insurers must negotiate hospital prices.

We exclude plan enrollment and hospital admissions among three specific integrated delivery systems – namely, Kaiser Permanente, Geisinger Health System, and Intermountain Healthcare – from the calculations of the Insurer:Hospital and Hospital HHI measures, respectively, in the geographic markets where their hospitals exclusively treat patients from the integrated insurer and there is thus no relevant hospital price negotiation. However, we do not remove the enrollment among these integrated delivery systems from the Insurer:Employer HHI calculations, as these plans compete with other plans for employer coverage.[11]

We consider two ways to define geographic markets: Core-Based Statistical Areas (CBSA) and counties. The CBSA is a geographic area defined by Office of Management and Budget to represent an area with commuting ties to an urban center. The 11 largest CBSAs (e.g., greater New York City, greater Chicago) are separated into smaller Metropolitan Divisions (e.g., four Divisions within New York City, three Divisions within Chicago), and so we use the smaller Metropolitan Division codes, when available, to define the geographic markets within these larger CBSAs.[12] While we believe that HHIs using the CBSA as the geographic market definition should reasonably characterize the market transactions for relatively-smaller employers purchasing coverage among competing private health insurers and reasonably characterize the market transactions between private health insurers and hospital systems, we also construct HHI measures using counties as the geographic market. Accordingly, we run a regression model using the CBSA for these three HHIs and then a separate regression model using the county for these three HHIs and report results for both measures.[13]

The joint distribution of the Insurer:Employer and Insurer:Hospital CBSA-based HHI measures is shown in Fig. 1A. While the two measures are strongly correlated across markets (i.e., the correlation coefficient is 0.83), there is actually a considerable level of differences between the Insurer:Employer and Insurer:Hospital HHI measures, so that we are able to disentangle these opposing effects of higher profits and lower hospital prices on premiums.
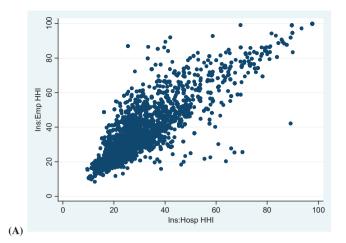
The joint distribution of relative bargaining leverage (i.e., Insurer:Hospital HHI and Hospital HHI for CBSAs) is shown in Fig. 1B. The correlation coefficient is 0.22, indicating that there is a mix of markets where the insurers have more bargaining power than hospitals, insurers have less bargaining power than hospitals, and insurers and hospitals have comparable bargaining power. The DOJ/FTC Horizontal Merger Guidelines provide particular HHI cutoffs as one way to categorize the level of competition in a market; by these standards, markets with an HHI between 1500 and 2500 are considered moderately concentrated, and markets with an HHI greater than 2500 are considered highly concentrated (US DOJ/FTC, 2010).
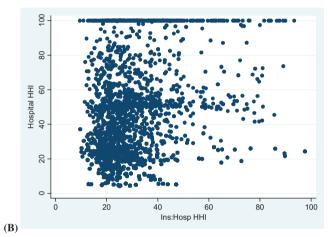
For the Insurer:Employer HHI measure using the CBSA for the market definition, 2.6% of plans are in un-concentrated markets, 39.3% are in moderately concentrated markets, and 58.1% are in highly concentrated markets. For the Insurer:Employer HHI measure using the smaller county for the market definition, 1.8% of plans are in un-concentrated markets, 35.1% are in moderately concentrated markets, and 63.1% are in highly concentrated markets. For the Hospital HHI measure using the CBSA for the market definition, 27.2% of plans are in un-concentrated markets, 29.8% are in moderately concentrated markets, and 43.1% are in highly concentrated markets. For the Hospital HHI measure using the county for the market definition, 10.8% of plans are in un-concentrated markets, 20.1% are in moderately concentrated markets, and 69.1% are in highly concentrated markets. Only 1.0% of plans are in

InterStudy data related to the fact that they only measured enrollment in HMOs do not apply to our study, as information on PPOs and other products was added beginning in 2005 associated with combining with HealthLeaders. Nonetheless, there are still concerns regarding the validity and volatility of enrollment. We have addressed these concerns in several ways. In particular, we have removed some enrollment to address the double counting issue of "rental network" enrollment, particularly in 2007–2008, following our own analysis and discussions with database managers at HealthLeaders-InterStudy. Additionally, we have taken several steps to address volatility in the data. First, we have taken the average MCO-product enrollment of the two observations per year (January and July) and used this as MCO-product enrollment for the year. Next, we aggregate total managed care enrollment (fully- and self-insured) in the data at the market (CBSA/Division or county) level, and compare this enrollment to estimates of the under-65 population for the market, which we obtain from the Small Area Health Insurance Estimates. We exclude from our analyses any markets where the aggregate private enrollment in the HealthLeaders-InterStudy data is less than 30% or greater than 100% of the total under-65 population in the market. We believe these are conservative cutoffs, as the under-65 population includes not only those that are privately insured, but also those that are uninsured and those with Medicaid or another source of public coverage (such as VA, Medicare, etc.). Additionally, we drop any market-year observations for markets in which the HHI is more than 25% greater or less than the mean HHI of that same market across the six-year time period included in our study (i.e., an implausibly large insurance market one-year outlier). Overall, these restrictions result in an exclusion of about 20% of the total plan-level observations in the KFF/HRET data. These excluded markets tend to have higher levels of insurance market concentration (likely due to mis-measurement), but are otherwise similar to the markets retained in our study.

[10] We also run models with alternative definitions of hospital product market, such as beds, total volume, total admissions, and Medicare discharges; hospital market concentration based on these different measures are all very highly correlated and our results are robust to these alternative definitions. Moreover, we believe that using the system-level measures (rather than individual hospitals) more accurately represent the bargaining nature with insurers.

[11] The results are qualitatively unchanged if we either do not exclude this enrollment and/or if we simply drop observations in markets with integrated delivery systems present in the market.

[12] The results are also qualitatively unchanged if we use CBSAs to define geographic markets without using the smaller Metropolitan Divisions within these 11 largest CBSAs.

[13] We also run models using the Dartmouth Atlas' Hospital Referral Region (HRR) as the geographic market for both Insurer:Hospital HHIs and Hospital HHIs, as the HRR has been frequently been used as a geographic market for healthcare. HRRs are generally larger geographic areas than CBSAs, so CBSA-level markets are typically more highly concentrated than HRR-level markets.

(A)

(B)

Fig. 1. Comparison of the two insurance market concentration measures and the joint distribution with hospital market concentration using CBSA market definitions. *Notes*: The scatterplots depict the joint distribution of the Insurer:Employer and Insurer:Hospital CBSA-based HHI measures of insurance market concentration in Panel (A) and the joint distribution of Insurer:Hospital and Hospital CBSA-based HHI measures for market concentration in Panel (B). Each dot represents a plan from the 2006–2011 KFF/HRET Employer Health Benefits Survey. HHI is Herfindahl-Hirschman Index.

CBSA markets where both insurer and hospital markets are unconcentrated. In contrast, 31.6% of plans are in CBSA markets where both insurer and hospital markets are highly concentrated.

4.4. Empirical model

We estimate parameters from the following OLS plan-level premium regression:

$$\ln P_{pt} = \alpha + \beta \text{Ins:Emp HHI}_{mt-1} + \varphi \text{Ins:Hosp HHI}_{mt-1}$$
$$+ \sigma \text{Hosp HHI}_{mt-1} + \gamma X_p + \delta F_f + \mu M_{mt-1} + \tau_t + \varepsilon_{pt} \quad (1)$$

where the indices are plan p, firm f, market m, and year t. The Ins:Emp HHI term in this equation is the one-year lagged HHI of the market in which insurers sell fully-insured policies to employers, the Ins:Hosp HHI term is the one-year lagged HHI of the market in which insurers bargain with hospitals, and the Hosp HHI term is the one-year lagged HHI of the hospital market. The X_p and F_f covariates are plan-level and firm-level control variables, while the M_{mt-1} are market-level controls, including the one-year lagged and logged CBSA-level per capita income, the lagged and logged mean HRR-level Medicare hospital reimbursement values, the contemporaneous state premium tax rate, and the contemporaneous state

mandated benefit index. (We lag the income and Medicare utilization values because they are essentially $t-1$ forecasts by an insurer while the tax rates and benefit mandates are known in advance.) τ_t is a year-indicator variable and ε_{pt} is the random error. We use cluster-corrected robust standard errors at the market-year level.

We first estimate the model for the entire sample. We then conduct sensitivity analyses by systematically excluding one or two of the three market concentration measures to allow us to examine our ability to disentangle the effects of insurer concentration through these measures. We then also estimate separate models for different subsamples, by first stratifying the sample by insurance market concentration and then stratifying the sample by hospital market concentration. These stratified models allow us to examine whether the effects of insurer and hospital market concentration on premiums appear to vary across markets. We use an HHI of 2500 for stratifying these samples, as this is the FTC/DOJ cutoff for a high level of concentration and it splits the sample roughly in half for the CBSA-defined markets.

5. Results and discussion

The first two columns of Table 1 include the weighted means and standard deviations (where applicable) of the variables used in our analyses. The weighted mean annual single-employee premium in our sample is $4567; this, as well as the insurer and hospital market concentration measures discussed below are similar to overall population-weighted national measures over this time period and thus do not appear to be idiosyncratic to the KFF/HRET sampling (which is designed to be nationally representative) or our exclusion criteria.

The next three columns of Table 1 present the full results from the OLS regression model for the annual premium shown in Eq. (1). Before discussing the results for insurer and hospital market concentration, we note that the results for the control variables generally appear as expected, indicating that the overall data and model is well specified. For instance, plans with higher deductibles have lower premiums, unionized firms have higher premiums, and smaller firms have higher premiums.

In this model using the CBSA as the geographic market, the coefficient for a 100 point increase in the Insurer:Employer HHI is 0.0021 and the coefficient for a 100 point increase in the Hospital HHI is 0.0019. These findings, which are statistically significant at the 5% and 1% levels, respectively, support our hypothesis that higher levels of both Insurer:Employer and Hospital concentration are associated with higher employer-sponsored health insurance premiums. To put a relative magnitude on these coefficients, we consider their effect size in the commonly-used example of a standard "five-to-four" merger – a market in which two of five equally sized firms merge, resulting in an 800 point increase in HHI (i.e., an HHI increase from 2000 to 2800). These coefficient estimates imply that a simulated five-to-four merger in the Insurer:Employer market is associated with 1.7% ($78) increase in premiums, and the same increase in the Hospital HHI is associated with a 1.5% ($67) increase in premiums.

The coefficient for a 100 point increase in the Insurer:Hospital HHI is −0.0024, also statistically significant at the 1% level. A simulated five-to-four merger in this insurer bargaining leverage market is associated with a 1.9% ($90) decrease in predicted premiums. This finding of a positive coefficient on the Insurer:Employer HHI term and a negative coefficient on the Insurer:Hospital HHI term provides support that there are indeed offsetting effects of increases in insurer concentration in terms of market power in selling insurance to employers (increasing premiums) versus negotiating leverage with hospitals (decreasing premiums).

Table 1
Summary statistics and premium regression results for insurance and hospital market concentration.

Dependent variable	Mean	Std Dev	Coeff	Std Err	p-Value
ln(Premium)	8.43	0.30	3.9720	0.4987	0.000
Market concentration variables					
Insurer:Employer HHI (CBSA)	31.07	13.44	0.0021	0.0010	0.029
Insurer:Hospital HHI (CBSA)	27.39	12.65	−0.0024	0.0009	0.006
Hospital HHI (CBSA)	30.78	23.79	0.0019	0.0003	0.000
Plan-level controls					
HMO	30.9%		Ref		
PPO	49.1%		0.1062	0.0154	0.000
POS	20.0%		0.0949	0.0197	0.000
Annual deductible ($000s)	0.44	0.72	−0.0581	0.0099	0.000
OOP Max < $1500	16.5%		0.0080	0.0156	0.607
Firm-level controls					
Unionized workers	21.2%		0.0810	0.0156	0.000
Percent low income (<$23,000)	13.0%	20.1%	−0.0564	0.0315	0.073
Percent part time	12.0%	16.5%	0.0344	0.0340	0.312
Firm size: 500+	26.7%		Ref		
Firm size: 100–499	25.1%		0.0211	0.0152	0.166
Firm size: 25–99	23.0%		0.0232	0.0173	0.179
Firm size: 3–24	25.2%		0.0407	0.0200	0.042
Construction	7.0%		Ref		
Manufacturing	9.1%		0.0398	0.0306	0.193
Mining	0.4%		0.0105	0.0770	0.891
Transportation	7.4%		0.1016	0.0391	0.009
Wholesale	4.7%		0.0409	0.0335	0.223
Retail	7.2%		0.0512	0.0363	0.159
Finance	8.9%		0.1222	0.0322	0.000
Service	40.8%		0.1277	0.0291	0.000
Government	7.1%		0.2106	0.0334	0.000
Healthcare	7.3%		0.1425	0.0364	0.000
Market-level controls					
ln(Per capita income)	10.62	0.20	0.2835	0.0417	0.000
ln(Medicare hospital payments)	8.38	0.20	0.1300	0.0387	0.001
State premium tax rate	0.99%	1.03%	0.8981	0.7783	0.249
State Mandated Benefit Index	9.49	4.20	−0.0004	0.0019	0.814
Regional controls					
South	29.8%		Ref		
Northeast	20.9%		0.0855	0.0195	0.000
Midwest	16.1%		0.0793	0.0216	0.000
West	33.2%		−0.0181	0.0192	0.345
Year controls					
Year 2006	15.9%		Ref		
Year 2007	17.1%		−0.0034	0.0227	0.880
Year 2008	16.5%		0.0618	0.0239	0.010
Year 2009	18.9%		0.1039	0.0223	0.000
Year 2010	16.9%		0.1439	0.0241	0.000
Year 2011	14.6%		0.1924	0.0260	0.000

Notes: The left-hand side of the table shows enrollment-weighted means and standard deviations from the 2006–2011 KFF/HRET Employer Health Benefits Survey with geographic markets defined as CBSAs. The right-had side of the table shows enrollment-weighted OLS regression results from a plan-level regression of log annual premium on the insurance and hospital market concentration. $N = 5270$; $F_{(32, 1288)} = 20.49$ ($p = 0.000$); $R^2 = 0.2176$. Standard errors are robust cluster-corrected at the market-year level. The insurance and hospital market concentration measures and other market controls are lagged by one year and HHIs are scaled by 100. Percentages may not sum to 100% due to rounding. The coefficient, standard error, and p-value included in the first row are for the intercept.

The results in Table 2 illustrate how the inclusion of the two distinct and potentially offsetting measures of insurance concentration (in the employer and hospital markets) appear to be necessary to disentangle the different effects of market power on the seller and buyer side. Table 2A's second column (labeled Model 1) repeats our main results including all three HHI measures using the CBSA market definition, and the next six columns show the results from additional separate regressions to show the possible permutations of including/excluding these three concentration measures. Our ability to capture these related but offsetting effects of insurer concentration is supported by the fact that the magnitude and statistical significance of the coefficients on these terms are diminished when only one of them is included in the regression specification. This is illustrated in the other columns of Table 2A; when only one of these insurance market concentration measures is included without the other (i.e., Models 2 and 3 with the hospital HHI excluded, Models 6 and 7 with the hospital HHI included), the portion of the offsetting effect on premiums that is

picked up by the measure limits its magnitude and significance in the direction that we expect. This provides support for the fact that these two insurance market concentration terms are indeed contributing unique information regarding the structure of the market in which the plan is sold and that in which the insurer bargains over hospital prices, and their relevant association with premiums. Finally, Model 4 indicates that our findings for insurance market concentration are not sensitive to the exclusion of hospital market concentration, and Model 5 indicates that our finding for the association between higher premiums and hospital market concentration is not sensitive to the exclusion of insurer market concentration.

Table 2B presents the results from this same set of regressions but instead using counties as the geographic market. While the mean concentration measures for the insurer and hospital markets are higher for county-defined markets compared to CBSA-defined markets (especially for hospital markets), overall the same pattern of regression results holds for the models using county as the market. In the model including all three concentration measures with

Table 2
Premium regression results for insurance and hospital market concentration measures excluding each measure, using (A) CBSA and (B) county market definitions.

ln(Premium)	Mean	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
(A)								
Ins:Emp HHI	3107	0.0021	0.0005		0.0028		0.0001	
SD/SE	1344	0.0010	0.0005		0.0010		0.0005	
p-Value		0.029	0.308		0.004		0.768	
Ins:Hosp HHI	2739	−0.0024		−0.0004	−0.0028			−0.0006
SD/SE	1265	0.0009		0.0004	0.0009			0.0004
p-Value		0.006		0.328	0.002			0.139
Hospital HHI	3078	0.0019				0.0019	0.0019	0.0020
SD/SE	2379	0.0003				0.0003	0.0003	0.0003
p-Value		0.000				0.000	0.000	0.000
N		5270	5270	5270	5270	5270	5270	5270
R^2		0.2595	0.2623	0.2624	0.2617	0.2599	0.2600	0.2599
(B)								
Ins:Emp HHI	3225	0.0025	0.0005		0.0029		0.0004	
SD/SE	1351	0.0009	0.0005		0.0009		0.0005	
p-Value		0.008	0.351		0.002		0.416	
Ins:Hosp HHI	2844	−0.0025		−0.0006	−0.0030			−0.0005
SD/SE	1269	0.0008		0.0004	0.0008			0.0004
p-Value		0.003		0.181	0.000			0.283
Hospital HHI	4293	0.0009				0.0011	0.0011	0.0011
SD/SE	2757	0.0003				0.0003	0.0003	0.0003
p-Value		0.001				0.000	0.000	0.000
N		5210	5210	5.210	5210	5210	5210	5210
R^2		0.2608	0.2624	0.2624	0.2616	0.2614	0.2614	0.2613

Notes: These seven models show selected enrollment-weighted OLS regression results from a plan-level regression of log annual premium from the KFF/HRET survey on the insurance and hospital market concentration measures using the CBSA as the geographic market in Panel (A) and the county as the geographic market in Panel (B). Standard errors (SE) are robust cluster-corrected at the market-year level. The three market concentration measures in the regression models are lagged by one year and scaled by 100 (i.e., the coefficients represent the effect of an HHI that is 100 points higher).

markets defined at the county-level, the coefficient for a 100 point increase in the Insurer:Employer HHI is 0.0025 and the coefficient for a 100 point increase in the Hospital HHI is 0.0009, both significant at the 1% level. Additionally, the coefficient for a 100 point increase in the Insurer:Hospital HHI is −0.0025, also significant at the 1% level.

5.1. Stratified analyses

Based on our discussion in Section 3, as well as the results from Town et al. (2006), we hypothesize that the effects of insurance and hospital market concentration may be more (or less) pronounced depending on the relative concentration of the other market. Specifically, the Town et al. theoretical and empirical results suggest that the positive effects of hospital concentration on insurance premiums will be more pronounced among competitive insurance markets. To test this hypothesis, we re-ran the regressions on two subsamples of the plans, stratified by the level of competition in the Insurer:Employer market; i.e., an HHI either below or above 2500. (We also stratify our models based on hospital concentration further below.) We use this stratified-sample approach, rather than an interaction term, so that we can observe the baseline effects in more competitive and more concentrated markets independently.

The findings from this analysis using CBSAs as the geographic market are presented in Table 3.[14] While we find that the

Table 3
Premium regression results for insurance and hospital market concentration measures, stratified by insurance market concentration.

ln(Premium)	1 Full sample	2 Ins:Emp HHI ≤2500	3 Ins:Emp HHI >2500
Ins:Emp HHI	0.0021	0.0061	0.0026
SE	0.0010	0.0039	0.0010
p-Value	0.029	0.115	0.026
Ins:Hosp HHI	−0.0024	−0.0004	−0.0023
SE	0.0009	0.0029	0.0010
p-Value	0.006	0.879	0.026
Hospital HHI	0.0019	0.0020	0.0018
SE	0.0003	0.0006	0.0004
p-Value	0.000	0.001	0.000
N	5270	2207	3063
R^2	0.2595	0.2427	0.2659

Notes: The first column repeats the regression results in Table 2A's Model 1, while next two columns show enrollment-weighted OLS regression results for premiums from the KFF/HRET survey stratified by level of insurance market concentration above or below an HHI of 2500. All markets are geographically defined using CBSAs. The three market concentration measures are lagged by one year and scaled by 100. Standard errors are robust cluster-corrected at the market-year level.

association between hospital concentration and premiums is significant among plans sold in both relatively more competitive downstream insurance markets and relatively more concentrated downstream insurance markets, we do not find evidence that

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[14] Repeating these stratified analyses using the county-based HHI measures with the same HHI cutoff above and below 2500 yields slightly different results. However, this appears to be due, at least in part, to the difference in the magnitudes of HHIs for markets using the county-defined markets as compared to the CBSA-defined markets (i.e., the mean HHIs for the smaller county-defined markets are higher). We instead observe a similar pattern of results using county-defined markets to those presented in Tables 3 and 4 using CBSA-defined markets if we increase

the HHI threshold cutoff (e.g., from 2500 to 3500 and thus roughly evenly-split subsample sizes) for stratifying more competitive versus more concentrated markets. Additional results from these analyses are available from the authors upon request.

the relationship is stronger among more competitive downstream insurance markets. The coefficient on premiums for a 100 point increase in Hospital HHI is 0.0020 in more competitive Insurer:Employer markets and 0.0018 in more concentrated Insurer:Employer markets, both significant at the 1% level.

However, we do observe that the negative association between the Insurer:Hospital concentration measure and premiums is stronger among more concentrated insurance markets. Specifically, the coefficient on premiums for a 100 point increase in the Insurer:Hospital HHI measure is -0.0023 ($p < 0.05$) for plans sold in more concentrated insurance markets (Column 3), and statistically insignificant (-0.0004) for plans sold in more competitive insurance markets (Column 2). In addition, this stratification by level of concentration in the insurance market reveals that, while the relationship between Insurer:Employer competition and premiums among more competitive insurance markets is statistically indistinguishable from zero, the extent of Insurer:Employer competition among more concentrated insurance markets is important.

These findings suggest that the effects of the levels of concentration in healthcare markets on premiums vary with the overall market characteristics. They provide evidence that increasing consolidation among hospital markets not only results in higher negotiated prices, but that these higher prices are ultimately passed-through to consumers in the form of higher premiums, regardless of downstream insurer market structure. The finding that the positive and negative associations between Insurer:Employer and Insurer:Hospital market concentration and premiums are strongest among the more concentrated insurance markets may suggest that the association between higher levels of insurance concentration on the ability to charge higher premiums to employers and to negotiate lower prices with providers may be particularly important among relatively more concentrated insurance markets.

Next we examined whether a similar pattern of results would emerge from stratifying the observations based on the level of hospital market concentration. Here we hypothesize that the association of the level of competition in the Insurer:Hospital market and premiums would be strongest among the more concentrated hospital markets, as the effects of increased insurer bargaining leverage may be less pronounced if hospital prices are already relatively low due to hospital market competition alone. Analogous to the above analysis, we stratified the observations into two groups according to level of concentration in the hospital market; i.e., Hospital HHI below or above 2500 using the CBSA-defined geographic markets.

The findings from this analysis stratified by hospital market concentration are presented in Table 4, where Column 1 again simply repeats the results from Table 2A's Column 1, and Columns 2 and 3 show the results among plans sold in markets with more or less competitive hospital markets. We find that the statistical significance of the positive and negative associations between premiums and Insurer:Employer HHI and Insurer:Hospital HHI, respectively, hold only among the more concentrated hospital markets. We also find that the statistical significance of the positive association between Hospital HHI and premiums holds only among the more concentrated hospital markets. These findings provide support for our hypothesis that, while hospital prices may already be relatively lower among more competitive hospital markets, in more concentrated hospital markets, more concentrated insurers may leverage their stronger bargaining power to negotiate lower prices among concentrated hospital markets and use their market power in selling insurance to employers to increase their profit margins.

Taken together, these results (from Tables 1 and 2) suggest that the levels of competition in the health insurance and hospital markets are significantly associated with employer-sponsored health

Table 4
Premium regression results for insurance and hospital market concentration measures, stratified by hospital market concentration.

ln(Premium)	1 Full sample	2 Hospital HHI ≤2500	3 Hospital HHI >2500
Ins:Emp HHI	0.0021	0.0013	0.0030
SE	0.0010	0.0015	0.0013
p-Value	0.029	0.378	0.023
Ins:Hosp HHI	−0.0024	−0.0012	−0.0034
SE	0.0009	0.0012	0.0012
p-Value	0.006	0.343	0.005
Hospital HHI	0.0019	0.0012	0.0015
SE	0.0003	0.0014	0.0004
p-Value	0.000	0.372	0.000
N	5270	3001	2269
R^2	0.2595	0.2487	0.2632

Notes: The first column repeats the regression results in Table 2A's Model 1, while next two columns show enrollment-weighted OLS regression results for premiums from the KFF/HRET survey stratified by level of hospital market concentration above or below an HHI of 2500. All markets are geographically defined using CBSAs. The three market concentration measures are lagged by one year and scaled by 100. Standard errors are robust cluster-corrected at the market-year level.

insurance premiums. Further, these results (from Tables 3 and 4) suggest that the negative relationship between premiums and insurer bargaining power with hospitals may be particularly pronounced among more highly concentrated insurer and hospital markets. Generally, they support the suggestion that the relative balance of insurer and hospital concentration also has important implications for insurance premiums, reflecting the underlying market structure that insurers must bargain with hospitals to set transaction prices, and thus the level of concentration in both insurer and hospital markets and their relative bargaining leverage jointly impact these negotiated prices. Importantly, they provide empirical evidence that these higher provider prices are often ultimately passed-through to consumers in the form of higher premiums, and that this pass-through also depends on relative market conditions. In general, we observe higher premiums among plans sold in markets with higher levels of hospital and Insurer:Employer concentration and lower premiums among plans sold in markets with higher levels of Insurer:Hospital concentration, especially among more highly concentrated markets.

5.2. Limitations

As noted earlier, the cross-sectional design of this study limits our ability to infer the causal relationship between the concentration of insurance and hospital markets and health insurance premiums. It is difficult to construct instruments that would represent an exogenous source of variation in market concentration that would be unrelated to premiums, particularly instruments that would be uniquely predictive of the two different insurer and the hospital concentration measures. One approach (for examining provider prices) is to instrument for insurer concentration using the underlying distribution of firms, but it is doubtful that this would be unrelated, independently, to employer-sponsored premiums. Another common approach is to exploit mergers as a source of variation in concentration over time, but there was little consolidation activity for insurers and hospitals during this time period for which we have these rich KFF/HRET data. Moreover, it is not clear that the merger itself would necessarily be exogenous. Yet another commonly-used approach is to construct measures of market concentration based on predicted, rather than actual patient flows, but we are limited by data and analytical resources to complete this exercise at the national level for hospitals and unsure how

one would apply this consumer-flow approach to insurer market shares. We have tried to alleviate these endogeneity concerns by lagging the market concentration and market control variables by one year; this at least implies a temporal relationship that is consistent with the hypothesis that the level of market concentration affects health insurance premiums. Additionally, if higher premiums in fact encourage market entry by other insurers, this would result in a more competitive health insurance market, which would bias our results downward. Nonetheless, we interpret our results as associations between market concentration and premiums and not necessarily a causal relationship.

Another limitation is that our model also measures the association between aggregate market-level measures of insurer and hospital concentration and the premium of a specific insurance plan purchased by an employer in that market. The KFF/HRET data do not allow for the identification of which insurer sold the policy to the employer, so we therefore are also unable to link the specific market share of that insurer to the observation. Similarly, we do not know anything about which hospitals are included in a given plan's network, nor about the insurer-hospital contracts. Thus, due to data limitations, we are unable to model the bargaining between insurers and hospitals and to consider constructs such as "Option Demand/Willingness to Pay" (Capps et al., 2003) measures for inclusion of certain hospital systems and the effects that this may have on premiums. Nonetheless, while the market measures may not reflect the specific insurer and associated network from which the plan is purchased, they do represent the overall market conditions within which the employer is choosing a policy. Thus, we believe that they provide important information regarding the relationship between market conditions and policies sold in those markets. Additionally, while we control for some plan generosity features such as plan type, deductible, and out of pocket maximum, premium variation may also reflect differences in quality and plan generosity that are not accounted for by these control variables (including the plan's network) which could conceivably be correlated with the extent of market concentration.

Additionally, our market concentration measures are reliant on how we have chosen to define the markets. While we believe that CBSAs represent a reasonable geographic market for employers purchasing insurance and a reasonable geographic market for hospital care, the extent to which our measures accurately represent the true level of competition in these markets depends on the degree to which they accurately reflect the markets in which insurance is purchased and hospital network inclusion negotiations occur, respectively. However, given that CBSAs are constructed to represent person-flows for commuting to employment, we believe that they represent reasonable choices for the markets we are trying to measure. We are also reassured by the observation that our results are similar when using counties instead of CBSAs.

Further, given that these KFF/HRET data are of plans actually purchased by employers, our analysis does not explicitly model the employers' option to not offer coverage or to self-insure as an alternative choice.[15] However, given that all the plans in our model are indeed purchased, they reflect choices that employers have made dependent on the local market conditions that do in fact exist, and thus we feel that they represent an appropriate association between market conditions and premiums.

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[15] We have also examined firm-level decisions to self-insure using these KFF/HRET data, with a primary focus on examining the influence of state community rating rules for low-risk versus high-risk industries among firms with 25–100 workers (Trish and Herring, 2014). In those analyses, there were no statistically significant associations between insurer market concentration nor hospital market concentration (included as control variables) and a firm's decision to self insure.

Overall, we believe that our ability to construct two distinct insurance market concentration measures using the variation in fully-insured and self-insured enrollment represents an improvement in depicting these markets and their unique association with health insurance premiums. Nonetheless, further work on these open questions is warranted.

6. Conclusion

The US health insurance industry is highly concentrated and health insurance premiums are high and rising rapidly. Our data demonstrate that less than 3% of the markets in which employers purchase fully-insured coverage are considered un-concentrated by the guidelines set forth by the DOJ/FTC. Similarly, more than half of these markets are considered highly concentrated. Provisions included in the ACA are focused on increasing competition in these markets, with the expectation that increased competition within the health insurance industry would help to lower premiums. Though focused on the individual rather than the employer-sponsored market, early evidence suggests that not all state insurance markets are, in fact, becoming more competitive (Cox et al., 2014) but that more competitive exchanges have lower premiums (Dafny et al., Forthcoming).

However, health insurers operate in a complex bilateral oligopoly, whereby they must negotiate service prices with hospitals and other providers, and higher levels of market power may in fact result in stronger bargaining leverage with these providers to drive down prices, which could then be partially passed through in the form of lower premiums. Thus, the ultimate impact of the level of competition in the health insurance industry on premiums is unclear – but it seems likely that the underlying goal of reductions in insurer administrative overhead associated with increased insurer competition can generally not be achieved without the unintended consequence of higher provider prices associated with decreased bargaining power with providers. The analyses presented herein suggest that the effects of increasing competition in health insurance markets on health insurance premiums are likely to depend on the level of competition in local hospital markets, as well as the relative competitiveness of the fully-insured and self-insured markets and insurers' overall bargaining leverage with hospitals and other local providers.

We find that employer-sponsored insurance premiums among a nationally representative sample of firms purchasing fully-insured products are higher in markets where insurance and/or hospital markets are highly concentrated, as compared to those in which they are more competitive. Further, we find that higher levels of concentration among the market in which insurance is sold to employers are associated with higher premiums, whereas higher levels of concentration among the market in which insurers bargain with hospitals are associated with lower premiums. Importantly, we find that higher levels of concentration in hospital markets are also associated with higher premiums – providing evidence that the well-documented higher prices resulting from consolidation among hospitals do in fact affect consumers in the form of higher premiums, and that local market conditions affect the extent of this pass-through.

However, our findings, along with recent literature suggesting that hospital prices are lower among more concentrated insurance markets, suggest that higher levels of insurer bargaining leverage with hospitals may lead to lower health insurance premiums via lower negotiated hospital prices, as long as there is sufficient competition in the market for selling insurance to small employers that these lower prices get passed through to employers in the form of lower premiums. Recent policy changes,

such as the introduction of minimum medical loss ratios, may help to ensure that such savings are passed through, even in the absence of higher levels of competition in this market. Additionally, our results suggest that this important negative relationship between insurer bargaining power and premiums is particularly pronounced among more highly concentrated markets. Taken together, these findings suggest that ACA provisions to increase competition in health insurance markets may be unsuccessful by not also considering the level of concentration in local hospital markets, particularly if they dilute insurers' overall bargaining leverage with local hospital systems. This may be particularly problematic due to recent provider consolidation trends and the strong incentives for such provider consolidation included in the ACA, such as increased horizontal and vertical integration resulting from the formation of Accountable Care Organizations. Therefore, efforts targeted toward reducing health insurance premiums may be better directed toward insurer–provider negotiations and rate regulation, or efforts to simultaneously reduce the level of concentration among insurers and providers.

Acknowledgements

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