

Healing the Body, Harming the Wallet? Hospital Market Concentration and Private Insurance Premiums under the Affordable Care Act (ACA)

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I. Abstract

Decades-long trends towards highly concentrated provider markets in healthcare have serious implications for the prices of healthcare services, one of the leading drivers of healthcare spending, and costs for consumers. This study examines the impact of provider consolidation on costs for consumers by analyzing the relationship between hospital market concentration and private insurance premiums in the Affordable Care Act's (ACA) health insurance marketplaces. Herfindahl-Hirschman Indices of market concentration were computed for 51 hospital markets across the nation and those markets were matched with premium data taken from Healthcare.gov via the Kaiser Family Foundation's annual analysis of premium changes. I used Ordinary Least Squares (OLS) regression to determine the relationship between hospital market concentration and private insurance premiums in the marketplaces, and I find a positive, significant relationship between market concentration and premiums. Such a finding suggests that premium payers who live in highly concentrated hospital markets may pay more for their health insurance in the ACA's marketplaces than those who live elsewhere, and such premium increases are nontrivial. The significant relationship between provider consolidation and higher premiums presents an opportunity for intervention to help lower healthcare costs moving forward. Bearing this finding in mind, I present a policy recommendation for provider consolidation moving forward that combines price transparency, regulation of hospital market pricing and behavior, and anti-trust litigation.

II. Introduction

On March 23, 2010, the Patient Protection and Affordable Care Act (ACA) was signed into law, passing Congress with 219 votes in the House, 60 votes in the Senate, and one signature of approval from President Barack Obama. The law incorporated ambitious goals for lowering the uninsured rate, cutting healthcare costs, reforming provider payments, and developing healthcare innovation, and represented the culmination of years of Democratic efforts at health reform in the United States. The first of these goals was perhaps the law's most central: lowering the percentage of individuals in the United States without health insurance. To do so, the ACA employed two mechanisms. First, it expanded Medicaid eligibility up to 138% of the federal poverty level (FPL) nationwide, eliminating the exclusion of childless adults and others in poverty who remained too "wealthy" for the strictest states' Medicaid eligibility requirements. Second, the law established health insurance exchanges in each state, to be run by the states themselves, if they wished, or by the federal government.¹

The creation of health insurance exchanges was a component of the ACA's individual mandate, which legally required that all individuals have health insurance. Mandating that all individuals have health insurance also required that the law provide a vehicle whereby those same individuals could easily access, compare, and shop for private health insurance plans, and hence the exchanges were created. However, for individuals not eligible for Medicaid, the now-mandated private insurance remained prohibitively expensive. In an effort to address this problem, the ACA extended premium assistance tax credits – effectively premium subsidies – for the purchase of private health insurance by families between 138-400% FPL. In spite of a rocky

¹ Health insurance exchanges are simply online marketplaces where individuals can shop for private health insurance plans. Hereafter they are referred to both as "exchanges" and "marketplaces," which are synonymous.

start for the ACA's website, Healthcare.gov, the exchanges eventually became functional, and by 2016, just four years after the exchanges opened, the uninsured rate in the United States had dropped precipitously; from the fourth quarter of 2013 to the first quarter of 2016, it fell from 17.1% to 11% (Marken 2016).

Though the aforementioned premium assistance tax credits have made private health insurance attainable for millions, premiums still face large annual hikes across the board for myriad reasons including sicker patients joining insurance pools; fewer healthy, young enrollees in the exchanges than predicted; insurers consolidating and driving up premiums; and hospitals markets concentrating and raising prices. This thesis investigates the last of these explanations, examining the relationship between hospital market concentration and private insurance premiums. Here, I define concentrated markets (hereafter referred to as "concentrated" or "consolidated," used synonymously) broadly as those with dominant hospitals or health systems, which have significant market share and pricing power over insurers. Competitive markets, by contrast, have more competitive hospitals and health systems and lower Herfindahl-Hirschman Indices (HHI).² Hospital market concentration is of concern for individual premium payers because when hospitals have greater market power, prices for insurers increase, and individuals may bear the burden of those price hikes in the form of increased insurance premiums. This has significant implications more broadly because it raises costs for individuals seeking to buy private health insurance.

More specifically, however, it has consequences for health reform in the United States for two primary reasons. First, a significant portion of the ACA's coverage expansion has been

² The Herfindahl-Hirschman Index (HHI) is a widely used measure of market concentration. It is calculated by summing the squared shares of the firms in a market. For example, a monopoly market with one firm whose market share is 100% has an HHI of $100^2 = 10,000$.

executed through private insurance. If hospital market concentration is indeed associated with higher private insurance premiums, then the citizens buying health insurance through the ACA's exchanges – many of whom are financially vulnerable to begin with – will face increasing premiums costs if they live in markets that are more concentrated. The recourse the law provides for such increases, a premium subsidy, can only defray these cost increases for individuals so much, and as those subsidies increase they drive up healthcare spending by the federal government. Second, the consequences of provider consolidation are of significant import for health reform because the ACA's delivery system and payment reform efforts have had some part in encouraging consolidation. The law's effort to improve coordination among providers via new payment models like Accountable Care Organizations (ACOs) has created incentives for providers to come together to make care coordination more efficient.

With the serious implications of hospital market concentration in mind, I calculate HHIs for a sample of hospital markets nationwide, match them with average premium costs³, and then use ordinary least squares (OLS) regression to determine if there is a statistically significant relationship between hospital market concentration and average premium cost. Significant literature exists on the ability of concentrated providers to raise prices on insurers, as I discuss in Section IV. However, literature on the relationship between private insurance premiums and hospital market concentration is less abundant, and even less so with regard to the ACA's exchanges. Herein lies the contribution of this investigation – an examination of the relationship between hospital market concentration and premiums, and specifically in the ACA's marketplaces. Such an examination may highlight a need for intervention in the ongoing implementation of the ACA in order to ensure that insurance remains affordable for all.

³ For premiums, I match each hospital market with an ACA exchange. I then use the average premium of the second-lowest cost silver plan in that exchange.

Though the ACA has done much to improve the affordability of private health insurance, premiums remain a serious financial burden for many, and, moving forward, health reform must strive to reduce that burden. If highly concentrated hospital markets are associated with higher private insurance premiums, then policymakers may direct some interventions at limiting hospital consolidation in order to reduce the pricing power of some hospital systems. Examining this relationship, and identifying hospital market concentration as a significant predictor of higher insurance premiums, may provide an avenue for health reform moving forward that aims not only to improve the fiscal sustainability of healthcare, but also to bring private health insurance premiums within the financial reach of millions nationwide.

In Section III, I establish the broader context for this examination, discussing the cost implications of consolidation in healthcare more generally as well as explaining the dynamics of healthcare markets, market-based and regulatory approaches to consolidation, and the impact of the ACA and health reform. Section IV establishes a theoretical framework for cost-shifting and more specifically reviews relevant literature on hospital market consolidation. In Sections V, VI, and VII, I report the methodology and results from my observational study of the relationship between hospital market concentration and premiums. Sections VIII and IX conclude with a policy recommendation and analysis followed by conclusions and discussions of further research.

III. Consolidation in the Healthcare Industry: The Broad Health Policy Context

Consolidation in healthcare remains a pressing issue for all parties in the industry. For example, while this thesis focuses on hospital market concentration, extensive literature also exists on the role of insurer consolidation in driving up premiums for consumers (Dafny et al. 2012; Dafny et al. 2015). Indeed, questions of market concentration among both insurers and

providers will be essential for the future of healthcare in the United States, particularly with respect to costs. Costs in the United States' healthcare system – of premiums, of care, those out-of-pocket – are an ever-present challenge in a nation that is projected to spend one in five government dollars on healthcare by 2024 (Keehan et al. 2015). Bearing in mind the serious cost challenges facing American health, and in conjunction with this investigation's focus on consolidation, I now establish the broad health policy context surrounding healthcare consolidation and its implications for the future of healthcare costs in the United States. In particular, I examine a few points: first, the United States' healthcare cost difficulties; second, the market dynamics of consolidation in healthcare; third, how market-based policies and regulation-based policies present options for moderating consolidation and controlling costs; and last, the implications of the ACA on consolidation and the prospects for reform moving forward.

The United States' Healthcare Cost Crisis

The United States faces a unique problem in healthcare costs: it spends more on healthcare than any other OECD country, but has some of the worst health outcomes (Squires and Anderson 2015). The first of these concerns – high costs – is the primary focus of this section. What is the nature of the United States healthcare cost crisis? Why does the United States spend so much more on care? What is the relationship with consolidation in the healthcare industry?

To understand the true excess of the United States' healthcare spending relative to other countries, it is important to present the statistics in question and place them in context. In 2013, the United States spent 17.6% of its GDP on healthcare, which accounted for a sixth of the nation's budget and amounted to \$9,257 per capita. Unsurprisingly, given the significant expansion of coverage under the Affordable Care Act and an aging population, those numbers

are expected to grow by 5.8% over the period 2014-2024 until healthcare consumes about twenty cents of every dollar spent by the U.S. government (Keehan 2015). On all of these metrics – healthcare expenditures as a share of GDP, per capita spending, and rate of growth – the United States’ spending dramatically exceeds a number of other OECD countries’ (Kaiser Family Foundation 2011). That the United States vastly exceeds other developed nations not only on total expenditures, but also on per capita expenditures, indicates that the spending differences are not mere products of the United States larger population or economy.

Importantly, this healthcare cost problem is not going away any time soon. While expenditure statistics on the United States’ contemporary cost challenges are urgent, equally pressing is the reality that costs will only continue to rise. As mentioned previously, the ACA’s expansion of the Medicaid program, as well as its provision of generous subsidies to defray the cost of private insurance premiums, will continue to drive cost growth into the future. Perhaps even more urgent than that, however, is the concern of an aging population, as the baby boomer cohort ages into Medicare with a tax base that is increasingly too small to fund Medicare’s growing rolls. The Medicare Part A Trust Fund, for example, which collects annual inlays via payroll taxes and then makes payments for beneficiaries’ hospital costs, is projected to run dry by 2028 (Centers for Medicare and Medicaid Services 2016). Determining what is behind these excess costs is challenging, but there is general consensus among experts on at least one point: the United States administers expensive services. In other words, healthcare costs are high in the United States because patients receive intensive, high-tech, high-cost treatments at a much higher rate than other countries, and those treatments are more expensive in the United States than in other countries. This does not mean that Americans see the doctor more, just that when they do go they tend to receive more expensive care (Anderson et al. 2003; Fuchs 2013).

This is one of the broader lessons about the implications of consolidation for the cost concerns in the United States' healthcare system. Given that so much of the excess of healthcare costs is driven by the administration of high-tech, intensive services and by the high pricing of those services, the role of hospitals and insurers in helping to depress cost growth is crucial. In particular, helping to stem the tide of rising healthcare costs will depend on the ability of the American health system to keep the prices for procedures down and to incentivize procedures that are high in value, not high in price. Necessarily, this will require negotiations between hospitals and insurers over the price of services. Understanding that hospitals with significant market power raise prices for insurers, it may be that a consolidated provider side of the healthcare industry poses significant challenges to serious efforts to tamp down costs (Robinson 2011). In other words, if the lever for lowering costs is lowering the price and changing the type of care provided, operationalizing that lever will require market conditions in which healthcare providers are not excessively powerful. Consolidation in the healthcare industry thus plays an essential role in the prospects for controlling costs moving forward. For the United States to reign in its excess spending, it will have to work at least in part to ensure that hospitals keep prices for services down, and doing so will require a concerted effort to ensure a competitive interplay between providers and insurers. The market dynamics of that interplay are the subject of the next section.

The Market Dynamics of Consolidation in the Healthcare Industry

It would be an incomplete examination to study consolidation in healthcare without some discussion of the insurance industry. Insurer market power has been the subject of much recent debate, in light of two developments in particular. First, the withdrawal of insurers from the ACA's marketplaces has left a number of states with few insurers to choose from, resulting in *de*

facto market dominance for some insurers as their competitors withdraw (Tracer and Darie 2016). Second, efforts by four of the nation’s five largest insurers to merge – Humana and Aetna, Cigna and Anthem – put insurer consolidation in the spotlight, especially when the Department of Justice (DOJ) moved to block the mergers on anti-trust grounds. The reasoning behind DOJ’s decision to block the mergers was apparent enough – there is evidence illustrating the benefit to consumers of competitive health insurance markets (e.g., Dafny et al. 2012; Dafny et al. 2015). However, with an eye towards increasingly concentrated provider and insurance industries, it is worth considering the nature of market dynamics in healthcare, which entail a unique interplay between insurers and providers, especially with respect to the pricing of services.

Market dynamics in the United States healthcare industry manifest primarily in negotiations between the healthcare industry’s two most powerful players, insurers and providers. The negotiation between these two essential actors defines the premium-related outcomes studied in this regression analysis as well as the prices of procedures. The relationship between the two groups is this: providers accept certain insurance, while insurers include certain providers in their networks. This relationship is the foundation for all subsequent negotiations that take place between the two, and the operative word here is “certain.” Both sides derive bargaining power from the ability to reject insurance at their hospital or exclude hospitals from the networks associated with their insurance plans.

Figure 1 illustrates different circumstances surrounding market competition and their associated outcomes. It is a two-by-two matrix that shows providers on the side (concentrated or competitive) and insurers on the top (concentrated or competitive). The top left box, for example, shows the outcome of a market scenario where both provider and insurer markets are competitive. In this case, competitive markets function well to lower premiums and prices of

care because they provide options. For example, if an insurer is negotiating with a hospital in a market where there are many high-quality hospitals, the insurer can readily walk away from the table (i.e., exclude that hospital from its network) if the hospital in question does not offer competitive prices. Similarly, in a competitive insurance market hospitals can reject one type of insurance and accept others that reimburse at a competitive amount.

Yet, what is unique about healthcare markets is that the competitive equilibrium (competitive provider and insurance markets) is not the only effective scenario for achieving lower prices for services. Such an outcome can also be reached in a market where both insurance and hospital markets are heavily consolidated, as is illustrated in the bottom right corner of the matrix. This might be considered the “consolidated equilibrium.” When both hospital markets and insurance markets are heavily consolidated, both sides have significant bargaining power; hospitals cannot afford to reject an insurer, and insurers cannot afford to exclude a hospital or hospital system from their network. By contrast, healthcare markets are dominated when insurers’ and providers’ market powers are asymmetrical – when one actor dominates its respective market and the other does not. Consider a market with a single insurer but a large supply of hospitals. No hospital can afford to reject the insurer; they would have no business. However, the insurer can pick and choose the hospitals that offer the lowest prices. The top right and bottom left boxes of the matrix in Figure 1 capture reflect these dominated market scenarios.

There should be some clarification of Figure 1, which refers to negotiations about prices of care. The matrix illustrates that jointly consolidated or jointly competitive markets can reduce prices of care negotiated between the two parties. However, this may not be true for other costs in the healthcare, system, like premiums. While both parties in the matrix have an interest in the price of care, only insurers sell insurance. Thus, imagine a scenario where both providers and

insurers are consolidated; this is the bottom right box in the matrix. Such a market may reduce the price of care as near-monopolistic providers and insurers negotiate those prices, but if there is only one insurer in a market, premiums may be much higher for the purchasers of insurance, who suffer from the lack of competition. All of this is to say that while jointly consolidated markets may be able to reduce prices of care, they can result in higher costs of things like premiums that would not be so adversely affected if the market were jointly competitive.

The lesson of these market dynamics is that consolidation in the healthcare industry can have benefits in addition to costs. Primarily, when both insurers and providers leverage comparable market power against one another, prices of services may go down, while asymmetric markets may result in higher prices. With these market dynamics in mind, I move to a discussion of how policy arguments surrounding healthcare consolidation – market-based or regulatory – might affect the cost question in the United States healthcare system.

Market-based solutions versus rules and regulations

Broadly speaking, there are two central schools of thought on policy interventions and American governance. Generally, liberals are hesitant to cede too much credence to power of markets and favor rules and regulations that govern a free market's operation; conservatives, by contrast, believe a mostly unfettered market will achieve socially optimal results and are proponents of market-based, rather than regulatory or government-driven, solutions. It should go without saying that these are by no means hard and fast distinctions; significant crossover exists between these broad economic ideological persuasions. Questions of market consolidation – and the consequent concerns raised therein – are no exception to this distinction. Here, I examine how free market-based policy arguments surrounding consolidation differ from regulatory-based arguments, and consider their implications for the cost of healthcare.

Market-oriented considerations to consolidation in healthcare hold in tension two competing concepts in economics: competitive markets and economies of scale. First, consolidation poses problems for competitive markets, as increasingly concentrated insurers and provider markets lower competition. As discussed in the previous section, the consolidation of providers significantly distorts equilibria in healthcare markets because the bargaining power of hospitals vis-à-vis insurers (and vice versa) may be dramatically asymmetrical. However, market-oriented approaches may also see value in consolidation due to economies of scale, an economic concept that asserts that, up to a certain point, increased production (in this case, provision of healthcare or insurance) leads to efficiency gains. In practical terms, the economies of scale argument suggests that consolidation may make it easier for providers and insurers to coordinate more care and coverage more efficiently, which provides the basis for arguments in favor of some consolidation (Frech et al. 2015).

Insofar as healthcare costs are concerned, market-oriented approaches to lowering healthcare spending and cost growth must strike a balance between consolidation that generates economies of scale and consolidation that is anti-competitive and inflates price due to dominant market shares. The results of this regression analysis suggest that provider consolidation may have reached anti-competitive levels in some parts of the country to the extent that there is a significant association between hospital market concentration and higher private insurance premiums. Similarly, there is evidence to suggest that consolidated insurer markets drive health insurance premiums up as well (Dafny et al. 2015). Thus, both providers and insurers struggle to hold in balance economies of scale and competitiveness.

Interventions to address provider consolidation are understandably variable, and generally fall into one of two categories: regulatory approaches or market-based approaches.

Given the apparent concerns of increasingly consolidated healthcare markets, what might market-based reforms look like? Such reforms may involve leverage existing market conditions to even out negotiating power. Consider, for example, public payers for health insurance, like state governments, that provide healthcare for their employees. These are organizations with massive numbers of health insurance enrollees and consequently have significant negotiating power with providers. Encouraging these groups to leverage their naturally occurring bargaining positions – driven by such large employee numbers – may help push down providers’ prices (Berenson et al. 2015). A similar avenue for market-based reform may be in creating greater price transparency, either by expanding oversight or making provider prices available (Berenson et al. 2015). Indeed, transparency and inducing better consumer behavior in the market are popular proposals for market-based reform. The theory behind these proposals is rooted in the notion that making consumers better purchasers of healthcare, and making healthcare markets more transparent, will force to providers and insurers to compete on value of care and coverage (Herzlinger 2015).

Regulatory reforms take a slightly different approach, tending more towards rulemaking and policy intervention for addressing provider consolidation. Perhaps the most explicit strategy for containing costs and managing the effects of provider consolidation is rate regulation, like all-payer rate setting, for example. In all-payer rate setting, governments regulate payments to providers such that all payers – public and private alike – pay the exact same rate, limiting the pricing power that providers hold in a market (Brown 2015). This model has had considerable success in Maryland, where it has been a valuable cost containment mechanism for the state since its inception in 1971 (Murray 2015). Still other reforms seek to use rules and regulations to encourage market entry and increase competition among providers by relaxing Certificate of

Need (CON) laws⁴ (Berenson et al. 2015). Doing so would theoretically increase the number of hospitals by reducing barriers to entry, thereby increasing competition in the market.

Regulation by government anti-trust policy is the classic example of a regulatory solution to consolidation. However, such a strategy has come under considerable fire for a few reasons, primarily that anti-trust has little effectiveness for existing monopolies. As I will note in an in-depth examination of the provider market in Section IV, consolidation in the provider industry has been ongoing since the late twentieth century, meaning that many hospital monopolies and oligopolies are well-settled and face little threat of being broken up by anti-trust litigation (Brown et al. 2015). The challenge for regulatory-based approaches is to recognize the limitations of antitrust efforts and move beyond them to more effective, less constrained strategies for addressing concentration and controlling cost. Though anti-trust offers limited ability to address extant concentrated markets, alternative regulatory approaches are promising for blunting the power of concentrated markets and, importantly, mitigating the impacts of that concentration on prices and healthcare costs.

The lists of potential reforms in each of the categories that is outlined here are hardly exhaustive; many market-based and regulatory reforms exist beyond the purview of those examined above. However, those listed here reflect the differences in the primary policy mechanisms for combating consolidation. Market-based approaches tend to capitalize on extant market realities and improve upon certain components of them: increasing transparency, making consumers more attuned to value of care, or inducing large payers to exert their market power. By contrast, regulatory approaches modify extant markets using rules. This is the nature of all-payer rate setting, which uses governmental regulatory capacity to unilaterally determine what

⁴ A Certificate of Need (CON) law is a state provision that requires certain areas of that state to demonstrate the need for a hospital before building one. It is considered a significant barrier to entry in hospital markets

providers will be paid; CON Laws, whereby governments modify barriers to licensure and market entry; and anti-trust litigation, which, in spite of its limitations for extant concentrated markets, can be used to prevent nascent consolidation.

Impact of the ACA and prospects for long-term reform

The extensive reforms implemented by President Obama's signature health reform law, the ACA, have played a significant role in the evolution of a consolidated healthcare industry. In this section, I will first examine how provisions of the ACA have directly and indirectly incentivized consolidation in healthcare, before discussing how the implications of this consolidation are in conflict with some of the law's broader goals. Then, I will briefly discuss the prospects for long-term reform with respect to consolidation in healthcare.

Provisions in the ACA incentivize consolidation in a number of ways, but perhaps the plainest of these is the law's efforts at payment and delivery system reform. Consider, for example, the Medicare Shared Savings Program (MSSP) and related provisions in the law that promote the formation of accountable care organizations (ACOs). ACOs are groups of providers who agree to come together and coordinate care in order to reduce costs. The success of an ACO is heavily contingent on providers' ability to coordinate care; indeed, the very premise of this organizational reform is to cut back on unnecessary care and ensure that a patients' different providers communicate to organize care across a continuum. Early evidence on the success of these ACOs at saving money is mixed, but some scholars have raised concerns about the impact of ACOs on provider concentration (McWilliams et al. 2016; Frech et al. 2015). Namely, these concerns revolve around the incentives that ACOs create, encouraging both horizontal and vertical coordination among providers as groups aim to consolidate and maximize efficiency and savings. Moreover, financial incentives exist for providers, who get to share in some of the

savings that are realized if they coordinate – and perhaps consolidate – effectively. Whether or not the benefits of ACOs justify higher consolidation is a question for a different investigation, but it is clear that this component of the ACA’s delivery system reform creates incentives for consolidation. This speaks to the challenges of some market-based reforms. Though reforms like ACOs are designed to tie payments to quality and make providers compete on value, they often have far-reaching implications for the organization of a healthcare market beyond the direct considerations of policymakers.

If the ACA’s creation of ACOs, and the explicit incentives for consolidation therein, are the law’s direct implications for consolidation in healthcare, then the insurance side of consolidation may be considered the indirect effect. As mentioned previously, the ACA’s health insurance marketplaces have struggled in early years with adverse selection, as plans in the individual market have not attracted the young, healthy enrollees necessary for a stable risk pool. Consequently, insurers in the ACA marketplaces have faced losses as beneficiary claims have exceeded premium revenues. The result of this has been significant withdrawal from the marketplaces by a number of insurers, including the nation’s largest, United Healthcare. As insurers have withdrawn, not insignificant numbers of counties and states have been left with few insurers in the exchanges, resulting in highly concentrated insurance markets (Tracer and Darie 2016). This, too, has important implications for the United States’ challenges with cost because insurance is heavily subsidized in the United States, whether via the ACA’s tax credits or via the tax exclusion for employer-sponsored health insurance. Early evidence on the ACA marketplaces suggests that having fewer insurers in the marketplaces results in higher premiums (Dafny et al. 2015). Given that the United States’ government subsidizes a significant share of

the private insurance sold in these marketplaces, higher premiums mean higher government outlays for healthcare, exacerbating the cost problem.

Thus, there is tension between some of the ACA's reforms and the ongoing consolidation of the healthcare industry. Most explicitly, the law's delivery system reforms, particularly the integration of care via ACOs, encourage significant consolidation among providers, who have both organizational and financial incentives to consolidate, coordinate care, and try and achieve shared savings. Related payment reforms like bundling care for different procedures may also create incentives for consolidation, but this remains to be seen as these payments reforms continue to roll out. Meanwhile, the ACA's marketplace difficulties with adverse selection have indirectly contributed to insurer concentration, as markets nationwide have seen insurers withdraw, leaving few options for consumers. That such consolidation, both of providers and insurers, raises concerns about costs for consumers illustrates an important point: there is some conflict in the ACA's reforms, which seek to control healthcare costs and improve affordability of care, but simultaneously create certain incentives for consolidation.

With this broad understanding of consolidation in the healthcare industry among insurers and providers, as well as an understanding of the implications for costs, I now turn to a more focused examination of the primary subject of this thesis: provider consolidation. In the section that follows, I offer a theoretical framework for cost-shifting in healthcare; detail trends in hospital market concentration over time; review evidence on the implications of hospital consolidation for the price of services; and close with a discussion of the implications of hospital consolidation for premium payers.

IV. Theoretical Background

Healthcare and its triangle of contracts

Healthcare in the United States' private market revolves around a series of negotiated contracts among three major players: insurers, patients, and providers. Over time, these contract-driven relationships have evolved, changing the face of healthcare payment along with them. The most fundamental change to these contracts has been the emergence of insurers; whereas healthcare was once consumed directly by individuals with limited information about their care, it now has a middleman in insurers that negotiate prices with healthcare providers (Dranove et al. 1993). Modern healthcare thus consists of a three-way network of contracts among patients and providers; providers and insurers; and insurers and patients.

The conventional wisdom that underlies this series of contracts suggests that costs incurred by one party may be shifted around this triangle and fall on another. The classic example of this cost-shifting is uncompensated care: hospitals raise prices on insurers to compensate for the losses they incur when patients cannot pay, and insurers then raise premiums on consumers in order to account for hospitals' new, higher costs. Though the evidence surrounding the uncompensated care example is contested, the cost-shifting paradigm is fairly agreed upon: costs are passed around the healthcare system via these contracts (Hadley et al. 2008). The negotiation power of the providers and insurers involved, explained in detail in Section III and visualized in Figure 1, is intimately related to this system of contracts and rooted in the market shares of these two powerful parties.

Hospital market concentration on the rise

The establishment of large academic hospitals and hospital systems is responsible for increasing concentration of hospital markets, a trend that grew throughout the late twentieth

century and has accelerated in recent years, due in part to the passage of the Affordable Care Act (Cutler and Morton 2013; Cuellar and Gertler 2005; Dafny 2014; Cuellar and Gertler 2003; Vogt et al. 2006). The evidence on this recent history of consolidation reflects the importance of health policy decisions in shaping hospital consolidation. In the 1980s and 1990s, efforts to increase managed care in the United States and control healthcare cost inflation encouraged hospitals to consolidate and shore up their market shares. As healthcare reshaped itself to cut back on waste and inefficiency, falling inpatient numbers encouraged hospitals to join together in order to make themselves essential to insurers (Cutler and Morton 2013; Cuellar and Gertler 2005). This consolidation rested on the logic that in markets where one or two hospitals dominated, insurers faced increasing pressure to comply with hospitals' demands, lest hospitals refuse their insurance and drive consumers to different plans. In spite of the incentives for consolidation that it created, managed care was not the sole culprit in these expanded efforts at consolidation; a number of hospitals merged in efforts to improve care coordination and strengthen their financial positions with insurers independent of managed care's efforts to cut back on waste (Vogt et al. 2006).

Whatever the motives, widespread evidence demonstrates that hospital consolidation rose during the 1980s and 1990s. This initial wave of consolidation peaked in the mid-1990s, but fell and briefly plateaued in the early 2000s – whereas 1997 saw 310 hospital mergers and acquisitions, 2000 saw just 132 (Cuellar and Gertler 2003); see Figure 2. Nonetheless, the race to consolidate had begun, as hospital systems, especially those led by large academic medical centers, began to dominate hospital markets locally and nationally. Indeed, though hospital mergers and acquisitions fell over the final few years of the 1990s, so, too, did the number of private hospitals unaffiliated with a hospital system, which dropped by nearly a fifth (Cuellar and Gertler 2003).

In spite of the drop and subsequent plateau in mergers and acquisitions in the late 1990s and early 2000s, recent literature demonstrates that hospital consolidation did not stagnate for long, and by the end of the 2000s consolidation was once again on the rise. From 2007 to 2012 alone, 432 mergers and acquisitions deals involving 835 hospitals were finalized, and by 2013 60% of hospitals belonged to a hospital system of some kind (Cutler and Morton 2013); Figure 3 illustrates the extent of this consolidation. The more recent uptick in hospital consolidation was due in part to the passage of the Affordable Care Act in 2010, which, as detailed in Section III, drove up consolidation in its encouragement of bundled payments and accountable care organizations (ACOs). Meanwhile, the legal prospects for challenging these mergers have remained limited, as the legal standards for antitrust litigation remain immensely complex and place a significant burden of proof on the prosecutors (Dafny 2014). The confluence of these factors – evolving managed care, hospitals’ strengthening of financial positions, and the difficulty of antitrust litigation – has produced an inescapable truth integral to understanding healthcare’s series of contracts: hospital consolidation has risen and continues to rise.

Market concentration and prices for insurers

Consolidation of hospital markets is fundamentally a question about the future costs of care because hospitals with high market shares raise prices on insurers. Hospitals in concentrated markets in California, for example, charged higher prices to insurers for six different procedures than did their counterparts in competitive hospital markets (Robinson 2011). This finding exemplifies the implications of consolidation for one leg of healthcare’s aforementioned triangle of contracts, as hospitals with more market power hiked prices on insurers. Moreover, such a result is hardly an outlier: that concentration plays an important role in driving up hospital prices, and that concentrated markets charge more than non-concentrated markets, are well-documented

concepts in healthcare research (Capps and Dranove 2004; Dranove et al. 1993; Gaynor and Town 2012; Berenson 2015; Gawande 2014; Keeler et al. 1999). Economically speaking, when hospitals consolidate and increase their market shares, they have greater ability to dictate prices to insurers. The logic behind this pricing power is explained in Section III, and visualized in the matrix in Figure 1. Importantly, this is not to suggest that hospitals mergers in all circumstances drive up price. Mergers may save money, but savings may be diminished if the mergers occurred in highly concentrated markets; in other words, even when savings are had, they are greater when markets are less concentrated (Spang et al. 2001).

Thus, the notion that high hospital market shares drive up prices is a generally agreed-upon issue in health policy. However, these are not simply questions of higher costs that remain static; hospital mergers and consolidation not only increase prices, but yield price increases that are growing ever faster (Keeler et al. 1999). Evidence suggests that these price increases are not trivial – in some concentrated markets they exceed 20% (Gaynor and Town 2012). Indeed, these price increases are so significant that they have elicited a number of calls for antitrust scrutiny to address the issue, a recommendation that is indicative of the serious implications of the consolidation at hand (Capps and Dranove 2004; Cutler and Morton 2013; Dafny 2014). Nonetheless, as I will discuss later in this investigation, there is no consensus on the employment of antitrust litigation to combat hospital market consolidation; some argue that the limitations of antitrust law necessitate an approach that integrates legal and policy-based strategies like reformation of provider payment models (Berenson 2015).

Implications for premium payers and the need for more research

Though rising hospital market concentration and hospitals' price hikes are well documented, research is limited on the implications for the third piece of healthcare's contractual

triangle: patients, or premium payers, in the ACA's newly created marketplaces. Primarily, the implications of higher hospital prices for private insurance premiums are understood as a function of cost-shifting within the triangle. If hospitals dominate markets and raise prices on insurers, then those price increases will be passed on to consumers in the form of higher premiums. By and large, however, the literature does not investigate changes in premiums as they pertain to hospital market concentration, let alone those in the ACA, excepting a few authors who merely recognize cost-shifting and suggest that higher prices may lead to premium increases (White et al. 2013; Capps and Dranove 2004; Town et al. 2007). While there is some literature on premium increases in the ACA as a product of insurer concentration (e.g., Dafny et al. 2015), evidence on the relationship between hospital concentration and private insurance premiums in the ACA marketplaces is limited. One of the few efforts to investigate the relationship between hospital consolidation and premiums in the ACA, published by America's Health Insurance Plans (AHIP) (2015), determined that in Missouri, Georgia, and Ohio, premiums were higher in regions with more concentrated hospital markets. In spite of this finding, this third piece of the triangle is largely uninvestigated. Thus, in addition to the aforementioned implications for affordability of insurance, examining the relationship between hospital market concentration and premium costs contributes significantly to the literature because it offers empirical evidence for this third piece of healthcare's contractual triangle.

Healthcare's contractual triangle, and the cost-shifting implications therein, are essential for capturing the implications of hospital consolidation for private insurance premiums. As the literature review above demonstrates, hospital consolidation has increased tremendously in recent decades and is frequently accompanied by increased hospital market power and increased prices for private insurers. Cost-shifting reasoning suggests that if premium-payers live in more

concentrated hospital markets, they will bear the costs of increased hospital prices as insurers raise premiums. Nonetheless, there is a noticeable dearth of literature on this final subject, and thus it is the object of this investigation to explore further the association between hospital market concentration and private insurance premiums.

With this theoretical background and broader health policy context in place, I now move to my observational study of the relationship between hospital market concentration and private insurance premiums in the ACA marketplaces. I begin with hypotheses.

V. Hypotheses and Observable Implications

The null hypothesis (H_0) is that highly concentrated hospital markets are not significantly associated with increases in average private insurance premiums. If I fail to reject this null hypothesis, the OLS regression will reveal that highly concentrated hospital markets are associated with lower private insurance premiums or are not associated with any change in premiums whatsoever.

Given the theoretical framework established in the theoretical background, I find this null hypothesis less likely than my own alternative hypothesis (H_A). I hypothesize that highly concentrated hospital markets will be associated with higher private insurance premiums. If this is true, highly concentrated hospital markets will be associated with higher insurance premiums at a statistically significant level, and moving from an unconcentrated market to a highly concentrated market should predict a premium cost increase, or vice versa. It is also possible that highly concentrated hospital markets will be associated with higher average private insurance premiums but at a non-significant level. However, this will not definitively suggest that the alternative hypothesis is false, just that the test of the relationship may be underpowered.

VI. Methodology

In order to investigate the relationship between hospital market concentration and private insurance premiums in the ACA marketplaces, I selected hospital markets from a variety of geographic regions nationwide and determined their market concentrations. Next, I identified the average premium for second lowest-cost silver plan in the 2016 ACA marketplace that corresponded with that hospital market. Finally, I performed OLS regression to determine the relationship between hospital market concentration and premium. This required measuring two primary variables of interest for comparison: hospital market concentration (independent) and average private insurance premiums in the ACA marketplaces that corresponded with those hospital markets (dependent). The ACA marketplaces offer health insurance plans in different tiers that are metallically coded; there are bronze, silver, gold, and platinum plans in every market, all of varying costs. Because these plans are differentiated primarily by beneficiaries' out-of-pocket costs, premiums included, one metal level was selected for comparison in order to hold plan type constant while comparing premiums across markets. A popular benchmark plan in the ACA marketplaces is the second-lowest cost silver plan in a given market because this plan is tied to federal subsidies for purchasing insurance. I compared average premiums for this plan across hospital markets.

Hospital markets were defined by the hospital referral regions (HRRs) outlined by the Dartmouth Atlas, a project dedicated to documenting the distribution of healthcare resources around the United States. Within these markets, a hospital's market share was calculated as the total number beds in that hospital divided by the total number beds in the entire market (Robinson 2011). Importantly, HHI calculations took into effect the importance of hospital systems in a given market. In order to account for the fact that most hospitals are affiliated with a

hospital system, I calculated systems' shares of the market where appropriate (Cutler and Morton 2013). For example, in the Durham, North Carolina HRR there are two hospitals that belong to the Duke University Health System (DUHS). To calculate the system's share of the market, I would sum the total number of beds belonging to DUHS hospitals and then calculate DUHS' share of the total market using this aggregate number of beds, rather than taking those two hospitals' shares separately. For unaffiliated hospitals, I calculated the individual hospital's share of the market. I examined fifty-one markets, one from each state and the District of Columbia. Doing so allowed me to match the hospital market in question to the average premium in that state in the 2016 ACA exchanges. Because the premiums were defined using state-level data, it was most practical to use one market per state and match it to that state-level premium.

I calculated the HHI by summing the squared shares of all of the hospitals in the market and recorded each index as a continuous numerical variable. Then, I converted each index to a categorical concentration datum for each market. Markets with HHI below 1,000 were designated unconcentrated, markets with HHI 1,000 to 1,800 moderately concentrated, and markets with HHI 1,800 or greater highly concentrated. This is a division of HHI indices used by the DOJ in anti-trust litigation (U.S. Department of Justice 2015). This resulted in an independent variable, hospital market concentration, that was measured both as a continuous variable using the raw HHI for the market and a categorical variable with three levels: unconcentrated (22% of sample), moderately concentrated (45% of sample), and highly concentrated (33% of sample). I computed one OLS regression model using the numerical measure of concentration, and one using the ordinal measure. All data were taken from 2016, the most recent year of complete ACA marketplace information.

Sources of Data

I drew my data from a number of sources. First, data on all health plans available through the ACA marketplaces are available on healthcare.gov, and a useful synthesis of that data was produced by the Kaiser Family Foundation (KFF) in its annual analysis of premium changes in the ACA exchanges. I used KFF's 2016 data on premiums for each market. The data I used to determine hospital markets' HHI came from two sources. First, I used the Dartmouth Atlas' HRRs to define the markets in question. An interactive map of the referral regions, as well as data on each region, is available on the Dartmouth Atlas' website. In order to calculate the HHI for these regions, I used the American Hospital Association's (AHA) free hospital look up tool, which is available on their website and produces a profile of every hospital in their database including information on the number of beds in a given hospital. In calculating this HHI, I replicated the methods of Robinson (2011), as mentioned previously. I drew data on the prevalence of CON laws from the National Conference of State Legislatures (NCSL); a list of states organized by Medicaid expansion status from KFF; and population data from the United States Census Bureau.

Definition of Variables

The variables presented in Equations 1 and 2 below were selected because of their influence on hospital market concentration and pricing. $AvgPrem_{Market}$ is a continuous variable measuring average premiums in 2016 dollars. In equation 1, HHI is a continuous numerical variable measuring concentration. In equation 2, HHI is measured with the terms *Moderate* and *Low* (*High* serves as the omitted category); the numerical definitions of those levels are defined above. $CrossState$ is a binary categorical variable identifying whether or not a market crosses state lines. This indicator variable intends to control for the fact that some markets touch multiple

states, while premiums are defined according to state-level data. *Region* is a categorical variable with four levels identifying different geographic regions of the country according to Census divisions: Northeast, West, South, and Midwest (omitted category). Widespread literature exists demonstrating the geographic variability of healthcare costs (see, e.g., Orzsag 2005; Welch et al. 1993; Wennberg et al. 2002); this variable intends to capture that variation.

CNLaw is a binary categorical variable identifying whether or not a state has a CON law. CON laws present significant barriers to entry in healthcare markets, and I expect that markets are less competitive when such laws are present. It is thus important to control for this barrier to entry in a study of hospital market concentration. *Medicaid* is a binary categorical variable identifying whether or not a state has expanded Medicaid. Under the Emergency Medical Treatment and Labor Act (EMTALA), hospitals are required to stabilize patients who enter their emergency room; these patients are often low-income and uninsured, and their care goes uncompensated, forcing hospitals to raise prices on insurers to compensate. The Medicaid expansion intended to insure more of these types of patients, and has reduced uncompensated care in a number of expansion states compared to non-expansion states already (Nikpay et al. 2015). In states where no expansion has taken place, however, uncompensated care persists, and so does the need for hospitals to raise prices; thus, I controlled for this factor. *ScaledPop* is a continuous numerical variable measuring the population for the market in question; these values were scaled for ease of interpretation by dividing the raw population count by 100,000. The population was included to address the fact that rural, low population areas are likely to have few providers because of low demand for services. Thus, even if providers in those markets have roughly equal shares, if there are only a few providers the markets will have high HHIs. This

variable was used as a proxy for this circumstance in an effort to control for the differences in the size of markets.

Data Analysis

Once I had the above data, I performed quantitative analysis in order to determine an association, if any, between high hospital market concentration and higher average premium prices for the second lowest-cost silver plans. To perform this quantitative analysis, I used two Ordinary Least Squares (OLS) regression models to evaluate the correlation between my independent variable (hospital market concentration) and my dependent variable (average premiums). I used Stata to calculate my regression and visualize the data involved. The first model (the “Continuous Model”) uses the numerical measure of concentration (HHI), while the second model (the “Level Model”) uses the categorical measure with three levels, as described above. The two models used were as follows.

Model 1: Continuous Model

$$\begin{aligned}
 AvgPrem_{Market} &= \alpha + \beta_1 HHI + \beta_2 CrossState + \beta_3 Northeast + \beta_4 South + \beta_5 West \\
 &+ \beta_6 CNLaw + \beta_7 Medicaid + \beta_8 ScaledPop + \varepsilon
 \end{aligned}$$

[Eq. 1]

Model 2: Level Model

$$\begin{aligned}
 AvgPrem_{Market} &= \alpha + \beta_1 Low + \beta_2 Moderate + \beta_3 CrossState + \beta_4 Northeast + \beta_5 South \\
 &+ \beta_6 West + \beta_7 CNLaw + \beta_8 Medicaid + \beta_9 ScaledPop + \varepsilon
 \end{aligned}$$

[Eq. 2]

Using regression was beneficial for answering my research question on two fronts: first, it captured the magnitude and direction of the associations between market concentration and average premium costs using coefficients; and second, it captured the significance of those associations using a p-value. Consequently, the model offered clear indicators about the accuracy of my hypotheses. If my hypothesis (H_A) were true, β_1 would be a positive coefficient in the Numerical Model – indicating an association between increased HHI and increased premiums – and would be statistically significant. Because the omitted category in the Categorical Model is highly concentrated markets, a negative, significant β_1 coefficient would lead me to reject the null hypothesis, suggesting that moving from highly concentrated markets to markets of moderate or low concentration would be associated with a decrease in premium. Finally, I had to consider the possibility of non-significant results, which did not necessarily indicate that my alternative hypothesis was incorrect, just that the test of the relationship between market concentration and premiums was insufficiently powered.

I performed interaction models on my significant findings. I did so to ensure that significant results were not contingent on the status of other covariates in the model. For example, an interaction model might illustrate whether or not a significant relationship between HHI and premium was contingent on whether or not markets crossed state lines. If the relationship were only significant when markets crossed state lines – in other words, if there were a significant interaction between HHI and crossing state lines – this would weaken the supposedly significant relationship between HHI and premium because it would mean that the significance of the relationship depended on another covariate in the model, rather than being significant independently. This was an important statistical check of my findings, and I describe the results of these interaction models below.

Original analysis indicated three outliers in my data – Anchorage, Alaska; Burlington, VT; and Cheyenne, WY. All had high premiums well outside the interquartile range, but were only moderately concentrated. Because of the influence of these outliers, I excluded them from analysis; regression results that include these markets are reported in Table 3.⁵ The regression results for the models with outliers excluded are reported in Table 2. The primary covariate of interest is the level of concentration of the market in question, and thus the coefficient of interest in Model 1 is β_1 and the coefficients of interest in Model 2 are β_1 and β_2 .

VII. Empirical Findings

Descriptive Statistics

The hospital markets examined in this investigation varied in their population size, levels of concentration and HHIs, geographic regions, Medicaid expansion statuses, presence of CON laws, and whether or not they crossed state lines. As mentioned previously, markets were defined according to the Dartmouth Atlas’s HRRs, and fifty-one markets were selected for inclusion in the study. Table 1 presents summary statistics. For numerical variables, the means and standard deviations are included. For binary and ordinal category variables, the means column represents the proportion of the sample represented at each of the levels.

The mean HHI for the sample was 1718, suggesting an average of moderate concentration; this is consistent with the fact that a plurality of markets was moderately concentrated. The sample was diverse geographically, including markets from all 50 states and the District of Columbia. In this sample, 17.7% of hospital markets came from the Northeast, 23.5% from the Midwest, 33.3% from the South, and 25.5% from the West. This distribution is

⁵ These outliers are likely the consequence of a factor not captured by the model: insurance markets. All three of these outliers had severely noncompetitive insurance markets in 2016, with all reporting two or fewer insurers in their exchanges. This lack of competition, and the consequent pricing power for insurers, may help to explain such high premiums.

captured in Figure 4. Moreover, geographic diversity existed among markets at differing levels of concentration; every geographic region had all three different concentration levels represented (see Figure 5). Of the 51 hospital markets sampled, 55% crossed state lines, while 45% did not. Further, 32 of the 51 markets were predominantly in states that expanded Medicaid, and 38 of the 51 had some kind of CON law. Finally, average premiums varied across the markets in question. The mean premium in the sample was \$285. Premiums ranged from \$183 in the least expensive market (Albuquerque, NM) to \$719 in the most expensive market (Anchorage, AK). Figure 6 illustrates the right-skewed distribution of premiums, which demonstrates that, despite the sample's large overall range, the majority of markets had premiums in the \$200-\$400 range.

Model 1 Results

Results indicate a positive, significant association between HHI and average premium cost. The model indicates that a 1-point increase in HHI is associated with a \$0.02 increase in the average premium. In a more concrete sense, for every one thousand-point increase in HHI, the model predicts an increase in premium of \$21. Because premiums are paid monthly, the model predicts that a one thousand-point increase in HHI sums to an annual increase in premium costs of \$252. Though unobservable factors complicate any assumptions of causality, this significant relationship is consistent with the logic that more concentrated provider markets have higher prices for insurers, and that those prices are eventually passed on to consumers in the form of higher premiums. This finding thus supports the theoretical cost-shifting argument in healthcare's triangle of contracts. Further, this result leads me to reject my null hypothesis that there would be no statistically significant relationship between market concentration and private insurance premiums.

In addition to a significant relationship between HHI and premiums, results also indicate a significant relationship between moving from a market in the Midwest to one in the Northeast and premiums. The model suggests that making such a move is associated with a \$32 increase in average premium. A similar significant relationship exists between moving from a Midwestern market to a Southern market and premiums. The regression indicates that moving from a market in the Midwest to one in the South is associated with a \$26 increase in average premium. These results suggest that certain areas of the country are associated with higher premiums than others. Due to unobserved characteristics not captured the model, no causality can be inferred (i.e., it cannot be assumed that the premium increase is caused by the geographic shift), but these associations are nonetheless significant.

Results also indicate a positive, significant relationship between scaled population and average premiums. According to the model, a 100,000 person increase in population is associated with a 0.9% increase in average premium. This finding suggests an association between increasing population and higher premiums, which is opposite the assumption that more heavily populated areas would necessarily have more providers, more competition, and thus lower premiums. This may be attributable to the fact that efficiency gains to economies of scale are greatest in areas with higher demand, such as urban areas. No other covariates were significantly associated with premium price.

I then ran interaction models on my significant findings, as described above. In doing so, I found no significant interactions among my covariates for my statistically significant findings, suggesting that my results were not contingent on the status of other covariates in the model. For example, the significant relationship between HHI and average premium was not contingent on whether or not certain markets crossed state lines.

Model 2 Results

Results indicate a significant association between level of concentration and premium cost. The regression coefficients suggest that moving from a highly concentrated market to a moderately concentrated market is associated with a \$27 decrease in average premiums, while moving from a highly concentrated market to an unconcentrated market is associated with a \$32 decrease in premiums. These results are consistent with the finding in Model 1; a decrease in premium associated with movement to lower concentrations is consistent with the association between increased HHI and increased premiums. Thus, in this model as well, I reject my null hypothesis that highly concentrated hospital markets would not be associated with higher private insurance premiums. This finding is consistent with the theoretical framework discussed earlier. Unlike Model 1, there were no statistically significant results for any of the other covariates, including geographic region. Finally, I again ran interaction models on my statistically significant findings. None of the interactions were significant.

Limitations of Model

There are important limitations to the model I used to illustrate the relationship between hospital market concentration and private insurance premiums. The first is that no causation can be inferred from the regression. All findings are based on observational data, and the significant covariates can only be said to be associated with average premiums, not to be the causes of premium changes. This leaves sufficient ambiguity over the actual causes of the premium changes observed in the model. Second, the model leaves a number of important characteristics of these markets unobserved. For example, an essential component in average premium for a market is the market power of the insurers who set the premiums for that market, as explained in Section III; such a variable was not included. Similarly, the model does not include any

demographic adjustments. Under the ACA, underwriting is still permitted based on rating areas (i.e., geographic region), age, and tobacco use. Premiums may be higher in areas with higher numbers of older beneficiaries or higher proportions of the population who smoke because these are populations that can legally be charged more for insurance based on these characteristics. These factors would influence the average premiums for those markets, but are not captured by the model. Finally, the model suffers from a small sample size. Only 51 markets were included, and three outliers were ultimately dropped from analysis. While this is a somewhat conservative test – and thus suggests that the significant findings are truly significant – increasing the sample size would increase the statistical power of the test, possibly resulting in more significant findings.

VIII. Policy Recommendation and Analysis

Given the theoretical framework and health policy context that I established earlier in this examination, and bearing in mind the findings of my statistical analysis, I now move to a policy recommendation to address hospital consolidation. I argue a tripartite approach to consolidation, integrating price transparency, regulatory oversight of hospital markets, and anti-trust litigation. Then, I offer a policy analysis of that recommendation based on equity, cost, and feasibility.

Policy Recommendation

First, market-based reforms should be pursued in order to improve price transparency, specifically the creation of an all-payer claims database. The theoretical framework outlined above, supplemented by the finding that hospital market concentration is associated with higher private insurance premiums, revolves around the pricing power of hospitals. Prices play a central role because when hospitals dominate a market they can raise prices on insurers, who may pass those price increases on to premium payers (Robinson 2011). Thus, in order to capture truly the

extent of the impact that concentrated provider markets have, it will be vital to have a plain understanding of the impacts of consolidation on prices, both for policymakers and consumers. Price transparency is an important step in that direction. States should develop all-payer claims databases, large collections of information on what is paid for all different kinds of healthcare services. These databases entail insurance companies submitting claims data for individual services and procedures to the database, and those data are then stored and organized in order to track the costs of hundreds of different types of medical care. Extensive data can be collected on selected features of services, including, for example, the type of care, where it was serviced, the cost of the service. Decisions on which features to include should be determined by health policy experts, insurers, and medical professionals.

Second, governments should employ regulatory oversight of hospital markets. State-level oversight boards should be established to monitor price increases in provider markets that are highly concentrated, and to monitor nascent mergers and acquisitions in markets on the verge of becoming highly concentrated. When anti-competitive behavior takes place, these boards can alert the DOJ of monopolistic concerns in order that necessary action be taken. The boards should collect regular information on hospitals in defined markets around the state, including data such as costs of services, number of beds, and number of admissions in a given year. These data can all be used to approximate individual hospitals' market power in a given area vis-à-vis insurers and patients alike, and will give the boards useful empirical support for any regulatory action taken against increasingly anti-competitive health systems. Upon the analysis of these and other relevant data points, the boards can communicate the incidence of unfair pricing policies or anti-competitive behavior to the DOJ, which can help to mete out legal action accordingly. It is

important to note that such oversight would depend in no small part on the first component of this recommendation; price transparency would be an essential part of such a policy.

Finally, governments should further develop the use of anti-trust litigation to prevent anti-competitive mergers. Current anti-trust policy makes it difficult to break up legally-acquired extant monopolies, but this does not undermine the purpose of anti-trust litigation altogether. The DOJ should continue using anti-trust litigation to address monopolistic consolidation before it takes place. In particular, regular communication with state-level oversight boards will allow the DOJ to expand their anti-trust efforts and capitalize on more localized efforts to monitor anti-competitive behavior. To that end, anti-trust litigation can be employed at the discretion of the DOJ to prevent mergers and acquisitions that further exacerbate existing consolidation. Though extant monopolies may remain, preventing further consolidation is no less essential. Anti-trust offers valuable legal recourse for prevent anti-competitive mergers and acquisitions in hospital markets, and the DOJ should expand its use.

I now present an analysis of these policy recommendations with respect to equity, cost, and feasibility. In my examination of equity, I consider which groups reap the benefits and which bear the burden of the policy recommendation. In my examination of cost, I consider what the costs, economic and accounting, of the policy recommendation are. Finally, in my examination of feasibility, I consider some of the bureaucratic and legal hurdles to passage and implementation of this policy recommendation.

Equity Analysis

Equity considerations in this analysis elicit a fundamental question about the recommendation proposed: who bears the burden of the policy and who enjoys the benefits? From an equity standpoint, it is best to evaluate this allocation of benefits and burden relative to

the status quo, the opaque healthcare pricing system that exists today. Primarily, individual consumers reap the benefits of price transparency created via a claims database because knowing the cost of healthcare is advantageous for patients across any number of socio-demographic measures. By and large, consumers are at a disadvantage in the status quo; they lack the bargaining power to negotiate any sort of payment with providers and insurers, and they lack the full information to shop around. A claims database helps to address the latter of these concerns, and helps to address some of the asymmetries between patients and the provider and insurer industries. The burden, by contrast, is borne by insurers and providers, primarily because the results of their price negotiations are fully exposed, and price hikes are entirely known by the public. Relative to their previous position of great privilege – presiding over opaque pricing and benefitting from significant information asymmetry vis-à-vis patients – providers and insurers are worse off, ceding these privileges under a policy of price transparency. While a claims database may impose such a burden on providers and insurers, the benefit to consumers of such a resource helps to justify it on the basis of equity.

The same can be said of the creation of oversight boards to monitor price hikes and anti-competitive behavior forwarded by providers. Under the status quo patients have little recourse for dealing with higher prices. Though price increases by providers are often borne by insurers, patients and premium payers ultimately wind up paying for them through higher premiums and greater out-of-pocket payments like coinsurance. Thus, creating a regulatory board to oversee price hikes and related anti-competitive behavior addresses yet another power asymmetry in the healthcare market by creating a representative of consumer interests that can check the pricing power of hospitals and other providers in a healthcare market. To that extent, consumers once again receive the benefits of such a policy, as oversight boards create a mechanism by which

anti-competitive practices by hospitals and health systems can be held in check by regulation. Hospitals bear the burden of the newly created boards due to increased regulation of their pricing mechanisms, but on equity grounds the effort to create a more even power dynamic between patients and hospitals through regulatory frameworks is justifiable. The ability of such a board to trigger action by the DOJ would give it some enforcement capacity.

The final component of this recommendation is the expansion and continued use of existing anti-trust policy in conjunction with newly-established oversight boards. Use of anti-trust is generally agreed upon as an equitable practice for the same reasons as the above two policies; it creates a powerful representative to intervene on behalf of less powerful individual patients and premium payers. Thus, as a matter of benefits, this component of the policy recommendation follows the common thread, as benefits go to consumers who receive legal recourse that helps to mitigate significant power asymmetries between them and hospitals. Similarly, as with all-payer claims databases and regulatory oversight, the burden of a new policy falls on the traditionally more powerful party, as a check is imposed to empower consumers.

With respect to equity, this policy recommendation serves consumers at the expense of hospitals. All-payer claims databases, regulatory oversight of pricing and behavior, and anti-trust litigation all represent policy mechanisms by which significant informational and power asymmetries between patients and hospitals are reduced. Thus, to the extent that these recommendations help to mitigate such asymmetries, they are justifiable on equity grounds.

Cost Analysis

The costs of this policy recommendation vary, though none are trivial. However, given the potential for equity improvements, as well as federal and state governments' evident

commitment to devoting resources to healthcare policy, these costs would not be dramatically out of line. This is particularly true in light of the potential benefits of such policies.

The creation of a claims database to improve price transparency presents moderate costs. Perhaps the most significant cost to creating such a database would be rooted in the scope and complexity of such an operation. An all-payer claims database would be a complex process requiring coordination across providers, insurers, health IT experts, and marketing consultants. Further, the database would store information that is highly specific, requiring extremely detailed claims and discharge information from thousands of different procedures, all of which vary significantly from one another and must remain distinct within the database.

The database will also require fixed costs for purchasing IT equipment like servers that can store payment information for thousands of different types of procedures among thousands of payers and providers. Further costs may include employing individuals to create and maintain the database. There may be, for example, teams of individuals at insurance companies that are tasked with monitoring payments and submitting new payments to the database. Similarly, whoever operates the database, presumably state-level governments or possibly a federal agency like HHS, would need personnel to process entries and monitor the general well-being of the database. All of these personnel would require payment and benefits; labor is expensive. Finally, some costs would be associated with marketing the database as a useful tool for the public. Aside from these accounting costs, there may be some opportunity cost to the labor of the personnel hired – who could theoretically be doing other work – but it is hard to truly estimate the magnitude of these costs. The database is thus a significant undertaking from a cost perspective. However, if implemented at the state level, the federal government can offer matching funds to

states to help create such databases, helping to reducing the burden of the database on state budgets, which are funded from a smaller tax base.

Rate oversight would require fewer costs than the database, but is not without costs of its own. The labor cost of such a policy would be the compensation of the oversight board, as personnel would be needed to review pricing policies of providers and judge whether or not price changes need be submitted to the DOJ for review. Board appointees tasked with monitoring developments in hospital markets would also require staff for research support and data analysis of market changes. Research costs for monitoring changes in hospital markets – which may include subscriptions to databases, relevant health IT, and other statistical software – would also play a significant role in budgeting. However, such a board may increase costs at the DOJ by sending more cases to the department for review and increasing the department’s workload. This may necessitate the hiring of more employees to address rising demand for anti-trust services. In spite of these costs, the creation of a regulatory board would cost markedly less than an all-payer claims database.

Finally, continuing and expanding anti-trust litigation presents new legal costs. If the government were to pour more resources into anti-trust in the hopes of preventing more impending mergers, the amount of litigation brought against anti-competitive firms would rise. Bringing these cases to court is costly, and they are often protracted legal battles requiring significant investments of time and resources. Lost time spent adjudicating anti-trust suits is a significant opportunity cost to the DOJ because in committing to further anti-trust litigation it chooses not to pursue other types of lawsuits on which it could be spend its time, such as in civil rights cases, for example. Further, if state-level regulatory boards were effectively created, the DOJ would receive more referrals of anti-competitive behavior to be addressed. Thus, aside from

the department's own efforts to increase anti-trust enforcement, the added workload from state regulatory boards seeking legal recourse for anti-competitive behavior would also drive up legal costs. Increased caseload may mean the need to hire new employees to cope with added litigation, as the department will need to commit personnel to researching and arguing new cases. The addition of such personnel in response to increased employment of anti-trust presents a nontrivial labor cost to the DOJ.

Feasibility Analysis

Implementation of these provisions will not be without some difficulty. Indeed, the feasibility of the three components of this recommendation varies; while price transparency and anti-trust generally receive bipartisan backing, establishment of government oversight boards may be less politically popular.

Price transparency has received significant partisan support in Congress, and is a feasible policy goal from a political standpoint. For example, in June 2016, Rep. Gene Green (D – TX) and Rep. Michael Burgess (R – TX) introduced the Health Care Price Transparency Promotion Act of 2016, a law aimed at making pricing and cost data publicly available to consumers (United States Congressman Gene Green 2016). Indeed, this is latest iteration in the introduction of the bill, which has been brought to the floor with bipartisan co-sponsorship six different times in the past ten years (United States Congress 2016). While the bill's repeated introduction suggests that it has not yet garnered sufficient support to pass, its regular bipartisan co-sponsorship does indicate that members of Congress on both sides of the aisle have demonstrated an interest in improving price transparency in healthcare.

Indeed, perhaps the most significant feasibility challenge to an all-payer claims database is the judicial branch. Efforts at price transparency were dealt a serious blow when the Supreme

Court ruled that certain employers offering self-insured plans could opt out of state-mandated databases that conflicted with the federal Employee Retirement Income Security Act (ERISA), creating a significant hole in the databases (Feyman 2016). While the ruling is undoubtedly an obstacle, it should not preempt states from attempting to create limited versions of the databases. Claims databases that do not include self-insured plans will inevitably be less complete than those with them, but any movement in the direction of creating a claims database will be a positive change for price transparency. This is particularly true in the light of the examination here; all of the plans in this study are taken from the ACA's individual marketplaces, and thus would be included. From a feasibility standpoint, there are apparent limitations to an all-payer claims database, but such limitations need not serve as a moratorium on incremental progress towards better price transparency.

State-level oversight boards to monitor pricing and hospital market competitiveness will face more significant political hurdles than an all-payer claims database aimed at price transparency. Indeed, these boards are likely the most challenging element of this recommendation from a feasibility standpoint. From an ideological perspective, such boards represent increased government regulation in the healthcare market. While more liberal politicians and members of the American public may see such government oversight in the market as justified on the basis of protecting consumers, conservatives that champion the free market to a greater extent may see such oversight as unnecessary government intervention. To that end, states with more conservative state legislatures may be far less inclined to establish such boards, particularly if doing so is a voluntary practice. A useful analogue for state-level implementation of regulatory boards to oversee hospital markets is the Medicaid expansion, made voluntary by the Supreme Court's ruling in *NFIB v. Sebelius*. Across the country

conservative states rejected the optional expansion of the Medicaid program, in spite of significant financial incentives from the federal government. Establishment of state-level regulatory boards may face similar challenges to implementation in more conservative states, especially if such implementation is optional.

Similarly, appointments to state-level boards will undoubtedly face controversy in a polarized political climate. Such boards might even be undermined by the appointment of individuals who are decidedly in favor of unfettered markets or are former industry executives. It is not difficult to imagine such a scenario in states that are ideologically opposed to the creation of the boards in the first place. Politically controversial appointments, and especially those of anti-regulation individuals, would pose significant challenges to the effectiveness of the boards in question.

Finally, the continued employment and further development of anti-trust litigation faces fewer political challenges than either of the other recommendations, but is most volatile with respect to its implementation. The ability to bring anti-trust suits and stop anti-competitive mergers is a well-established power of the DOJ, and has been since the passage of the Sherman Antitrust Act of 1894. Therefore, using anti-trust litigation to prevent nascent mergers and acquisitions that are anti-competitive is not subject to the policymaking process that an all-payer claims database would be, for example.

However, anti-trust litigation would face challenges in implementation, primarily because the decision to bring such litigation would be at the discretion of the DOJ, as directed by a politically-appointed Attorney General. There is significant political turnover to the federal bureaucracy when administrations change, and with such turnover comes new leadership and vision for how federal agencies should be run. The incoming administration of conservative

President-elect Trump and Attorney General-nominee Jeff Sessions, for example, will likely be more averse to employing anti-trust litigation than has been the administration of President Obama and Attorneys General Eric Holder and Loretta Lynch. In that sense, though the use of anti-trust is well-established and faces fewer feasibility questions in a lawmaking sense, the employment of such litigation is contingent to some extent on the compliance of the sitting Attorney General who leads the DOJ.

Thus, this policy recommendation poses an alternative to the status quo that offers an equitable solution by creating checks on powerful providers and protecting individual consumers. It is not without costs, as all-payer claims databases and added anti-trust litigation in particular pose nontrivial legal, labor, and technical costs to implementation. However, in the grander scheme of healthcare spending such costs are on the lower end of the spectrum, and here have significant potential for equity improvements and cost-saving improvements from limiting provider consolidation. Finally, in spite of the political feasibility challenges for oversight boards, at least two components of this recommendation stand a reasonable chance of implementation, as price transparency has bipartisan support and anti-trust litigation is a well-established practice of the government, if one subject to the ideological persuasions of the sitting Attorney General. Thus, this recommendation offers some recourse for provider consolidation moving forward, especially bearing in mind the consequences of such consolidation that are presented in this investigation. That a significant, positive relationship exists between provider consolidation and private insurance premiums in the ACA marketplaces underscores the importance of a policy solution that protects vulnerable individuals by offering equitable solutions. And, given the already dire nature of the United States healthcare cost crisis, it is

important that such reforms not present costs that would dramatically exacerbate an already growing healthcare financing challenge. This recommendation meets these needs.

IX. Conclusions and Further Research

While this investigation returned significant results, it also merits further research. First, more methodologically rigorous analyses of the impact of hospital market concentration on premiums should be conducted in order to infer causation. Different approaches for doing so, such as the use of an instrumental variables model, may elucidate more clearly the causal effect, if any, of hospital market concentration on premiums in the ACA marketplaces. Further, research should continue to monitor the impact of the ACA's payment and delivery system reforms on consolidation among providers as well as insurers. As new Alternative Payment Models (APMs) outlined in the Medicare Access and CHIP Reauthorization Act (MACRA) begin being implemented, concurrent with the ongoing expansion of ACOs, it will be important to observe how consolidation in the healthcare industry changes over time. Finally, ongoing research should examine the effectiveness of the policy recommendation proposed here. Specifically, further research should examine how regulatory oversight and transparency impact healthcare costs, and how local implementation of these policies has proceeded.

Since the increase in managed care in the late twentieth century, hospital consolidation has increased dramatically across the United States' healthcare industry. Here, I examined the association of hospital market concentration with private insurance premiums in the ACA's health insurance marketplaces. I found a positive, significant correlation between hospital market HHI and average premium. While this analysis cannot infer causation due to unobserved characteristics of markets that are not in the model, the finding lends credence to the theoretical cost-shifting framework that underlies healthcare's triangle of contracts. That premium payers

are expected to pay more for their premiums if they live in more concentrated markets is consistent with cost-shifting logic.

My main finding of interest, the significant association between HHI and premiums, leads me to reject my null hypothesis that no association would exist. This finding has significant implications for broader health policy questions about consolidation and the United States' ongoing healthcare cost challenges. As the United States seeks policy solutions to mitigate its ongoing challenges with healthcare costs, a problem driven primarily by high costs of care, this study presents important context for that search. In a healthcare system where high and rising costs are driven primarily by the high cost of services, understanding how those services are priced is an integral component to helping lower the amount the United States spends on healthcare. To that end, this thesis offers important considerations about the ability of consolidated providers to dictate high prices and the adverse effects those prices may have on individual consumers. Such adverse effects may be a point of intervention in the healthcare market, and here I recommend the creation of all-payer claims databases, creation of state-level oversight boards to monitor hospital markets and anti-competitive behavior, and expanded use of anti-trust litigation as a remedy for these concerns.

My significant findings and analysis suggest that hospital consolidation is an issue of serious import for the healthcare industry, and deserves careful consideration as a point of public policy intervention moving forward. Reforming the treatment of heavily consolidated providers will be essential for the United States as it moves towards a future where healthcare and health insurance are affordable for all and government spending is sustainable. The policies I have proposed here, alongside ongoing reform of the healthcare system in general, offer suggestions

for a move towards a healthcare system that is more equitable, more transparent, and more sustainable for the United States' future.

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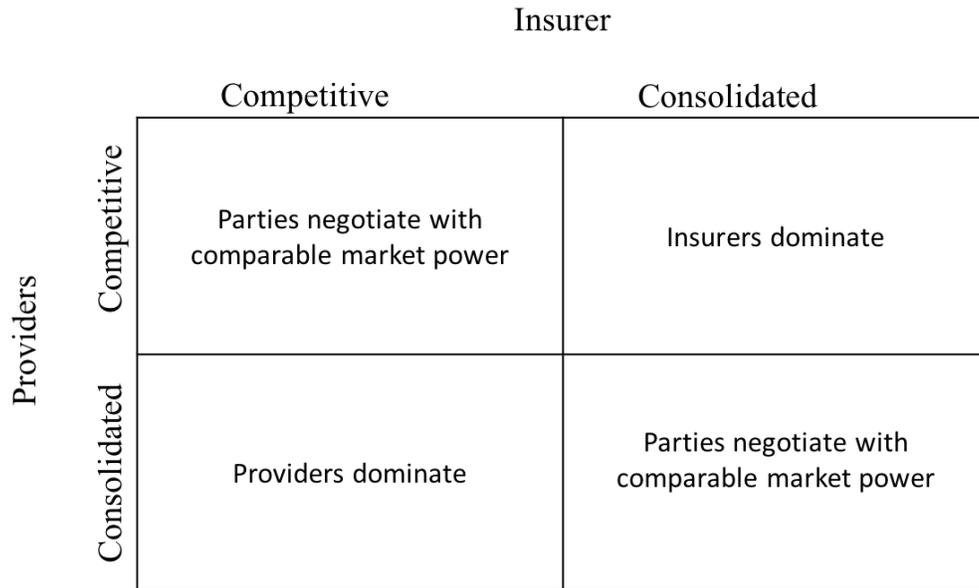
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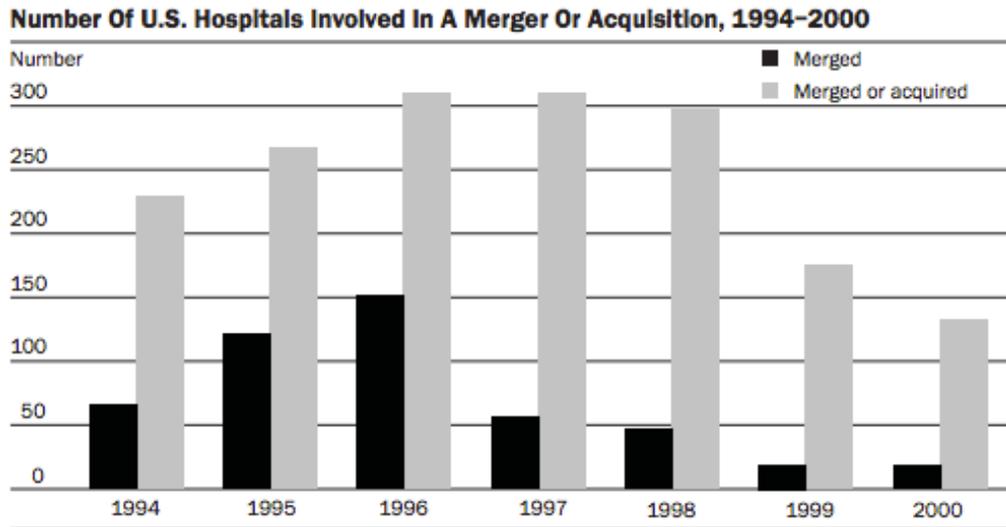
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Figures

Consolidation and Negotiating Power in Healthcare Markets



[Figure 1]



Source: Cuellar, A. E. and P. J. Gertler (2003). "Trends in hospital consolidation: the formation of local systems." *Health Aff (Millwood)* 22(6): 77-87.

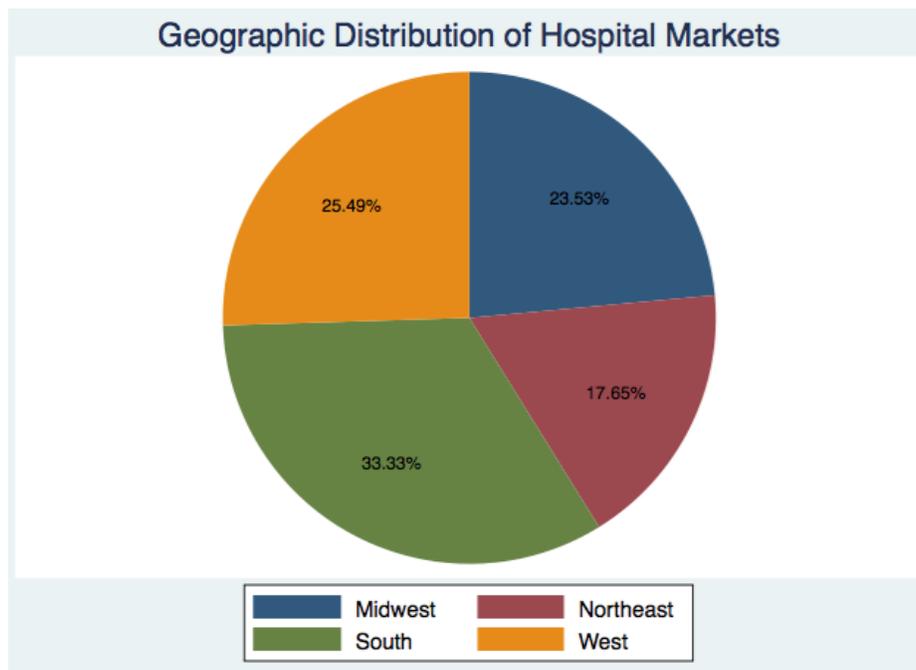
[Figure 2]

Table 1. Consolidation in the US Hospital Industry in 2011

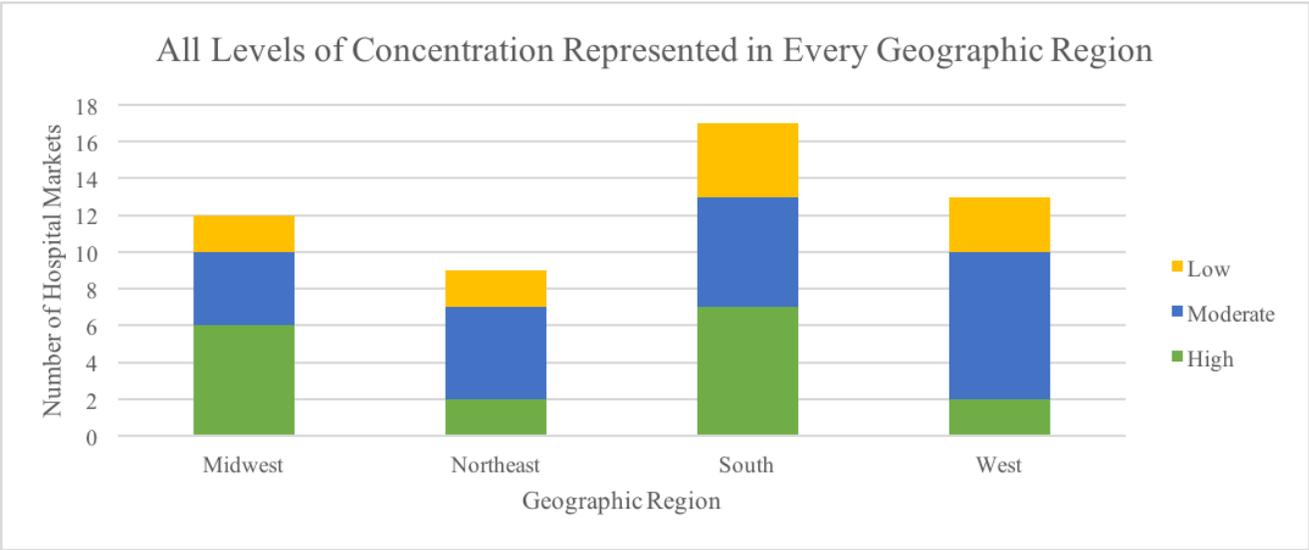
	Percentage ^a
Hospital data (N = 4973)^b	
Hospitals in a health system	60
No. of hospitals in typical system	3.2
Offering nonhospital services	
Home health care	60
Skilled nursing facilities	37
Hospice services	62
Assisted living care	15
Mergers and acquisitions^{b,c}	
No. of deals	432
No. of hospitals	832
Ownership of physician practice^d	
By hospitals	49
By physicians	41
Other ^e	10

[Figure 3]

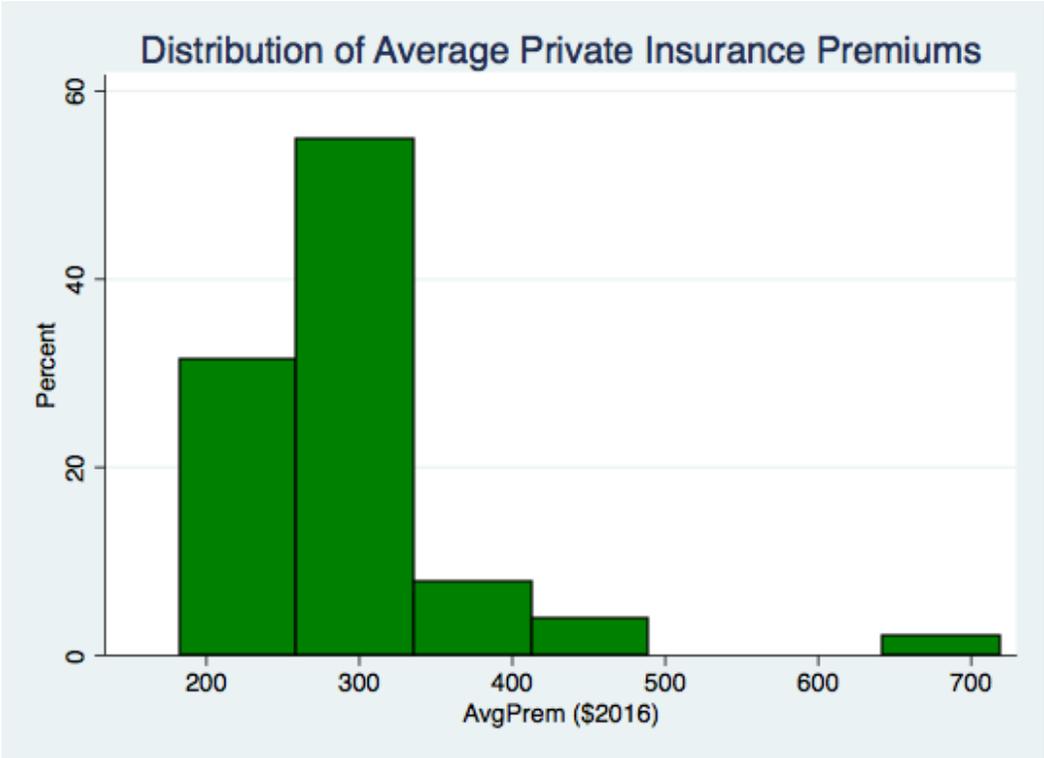
Source: Cutler, D. M. and F. Scott Morton (2013). "Hospitals, market share, and consolidation." JAMA 310(18): 1964-1970.



[Figure 4]



[Figure 5]



[Figure 6]

Tables

Table 1: Summary Statistics of Hospital Markets		
	<u>Mean</u>	<u>SD</u>
HHI	1717.92	950.80
Scaled Population	7.29	13.14
Average Premium (\$2016)	293.49	81.71
Concentration (Omitted: High)		
Unconcentrated	0.22	
Moderate	0.45	
Medicaid		
No Expansion	0.37	
Certificate of Need Law		
Yes	0.75	
Region (Omitted: Midwest)		
Northeast	0.18	
South	0.33	
West	0.25	
Cross State Lines		
No Cross	0.55	
<i>Sample size</i>	<i>51</i>	
Note: Sample sizes are unweighted.		

[Table 1]

Table 2: Relationship Between Market Concentration and Private Insurance Premiums, Excluding Outliers

		Model 1: Continuous Model		Model 2: Level Model	
		<u>b</u>	<u>SE</u>	<u>b</u>	<u>SE</u>
HHI		0.021***	0.006		
Level of Concentration					
Unconcentrated				-32.47+	17.947
Moderate				-26.796+	14.156
CrossState					
No Cross		-17.326	12.895	-21.639	14.084
Region					
Northeast		32.124+	18.134	29.674	19.803
South		26.36+	15.354	22.612	16.664
West		-12.347	16.92	-14.329	18.549
Medicaid					
No Expansion		7.567	13.608	7.183	14.811
CNLaw					
Yes		10.142	13.902	5.09	15.154
ScaledPop		0.902+	0.46	0.807	0.54
Constant		220.904	23	283.955	20.604
<hr/>					
<i>Sample size</i>		<i>48</i>		<i>48</i>	
<hr/>					
+p <.10, *p < .05, **p<.01, ***p<.001					
Note: Sample sizes are unweighted.					

[Table 2]

Table 3: Relationship Between Market Concentration and Private Insurance Premiums, Including Outliers

		Model 1: Continuous Model		Model 2: Level Model	
		<u>b</u>	<u>SE</u>	<u>b</u>	<u>SE</u>
HHI		0.018	0.013		
Level of Concentration					
Unconcentrated				-28.682	37.523
Moderate				-1.767	29.15
CrossState					
No Cross		20.3	26.259	14.44	27.134
Region					
Northeast		54.192	38.877	46.041	40.176
South		13.049	34.003	9.33	34.724
West		47.449	35.251	39.929	36.725
Medicaid					
No Expansion		24.094	28.704	23.221	29.451
CNLaw					
Yes		33.868	30.208	30.66	30.981
ScaledPop		-0.099	0.999	-0.014	1.115
Constant		193.511	50.373	241.154	42.215
<i>Sample size</i>		<i>51</i>		<i>51</i>	
+p <.10, *p < .05, **p<.01, ***p<.001					
Note: Sample sizes are unweighted.					

[Table 3]