The Big Cost of Big Medicine:
Calculating the Rent in Private Healthcare

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The Big Cost of Big Medicine

– Calculating the Rent in Private Healthcare

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Abstract: As a country, the United States spends significantly more on healthcare than other advanced industrialized countries, and Americans have comparably worse health outcomes. Both are developments of the last four decades. In this paper, we look at how change in antitrust and patent law and thus change in market power in the largest four subsectors of healthcare, hospitals, physician groups, prescription drugs, and net medical insurance, have contributed to the increasing cost of medical care in the United States. We show that the annual rent – the degree to which health care is overpriced as a result of market power – was between 2.47 and 4.30 percent of GDP in 2016 – truly a big cost for big medicine.

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Introduction

        As a country, the United States spends an incredible amount on healthcare. In 2017, total healthcare spending amounted to more than seventeen percent of gross domestic product (GDP). This represents both a high historically and relative to other advanced industrialized countries. For example, France spent only 11.46 percent of GDP on healthcare in 2017; Germany spent 11.27 percent, and other developed countries spent even less. This dramatic difference in health spending between the United States and other industrialized countries is a phenomenon of the last forty years. In 1980, developed countries spent between 4.74 and 8.23 percent of GDP on healthcare. While the United States represented the upper bound in this range, Germany spent the same percentage of GDP on healthcare as the United States in 1980, and, in general as can be seen by the more compact range, there was no dramatic difference in spending between developed countries – at least relative to current standards. However, since 1980, spending on healthcare in the United States has rapidly increased – moving away from its developed counterparts. At present, there is an almost nine-percentage point difference between spending on healthcare as a percentage of GDP in the United States and the average for all other member countries of the Organization of Economic Cooperation and Development (OECD), and there is a five-percentage point difference between the United States and the advanced industrialized country that spends the second most on healthcare, France.

        Despite spending vastly more on healthcare, many health outcomes in the United States are significantly worse than those of other developed countries. For example, over the same period that total spending on healthcare as a percentage of GDP has dramatically outpaced other advanced industrialized countries, life expectancy at birth in the United States has lagged more and more behind. At present, life expectancy at birth for Americans is 78.7 years – two years less than Germany and more than five years less than Japan with other advanced industrialized countries falling somewhere in between. Indeed, the United States ranks 28th among all 36 OECD countries in life expectancies at birth. Like with healthcare spending, these developments are relatively new. In 1980, life expectancy at birth in the United States was comparable to other OECD countries.[3]

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[3] Data on total healthcare spending as a percentage of GDP and life expectancy at birth is taken from the OECD database (https://data.oecd.org/).

Thus, we must ask: why does the United States spend so much on healthcare as a percentage of GDP compared to other countries while many health outcomes for Americans are comparatively worse? Also, what has happened over the last four decades that has led to dramatically increasing costs in the United States with comparatively worse outcomes? And, finally, if the increase in cost is not coming from increase in quality, how much are Americans overpaying for healthcare? Otherwise said, what is the economic rent – the income not commiserate with marginal social benefit – accruing to some in the healthcare industry? In this paper, we attempt to answer these questions through looking at the change in market power of providers in the different subsectors of healthcare. As we will see, increased market power of healthcare providers explains a significant portion of why Americans spend so much compared to other advanced industrialized countries and points to a clear path to remedying these problems.

Literature Review

Market power is the ability of an economic agent that is selling some good or service to increase its price above the marginal cost of production, or the ability of an economic agent that is buying some good or service to decrease its price below the marginal benefit. Market power is obtained through reducing competition from other firms that are selling or buying the same good or service, and it can be more freely wielded when there is no market power on the other side of the market – i.e. if there are many buyers for a monopolistic firm or many sellers for a monopsonistic firm.[4] Firms seek market power because it increases profits. However, it does so at the expense of others in society.

Market power is an important factor in understanding comparative health expenditures because of the divergence in institutional developments in the United States and in other advanced industrialized countries. In terms of the latter group, all developed countries, except the United States, have instituted health care systems which are either fully administered by their country's government or partially administered through government control of the national health insurance. This has allowed countries to set prices directly, in the case of completely

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[4] The idea of freedom to wield market power was developed by Galbraith (1952). He argued that where competition was missing on the same side of the market, the negatives from monopolistic or monopsonistic activities could be stymied through countervailing power – i.e. market power on the other side of the market.

public healthcare systems, or to use the weight of the government as the national insurer as a countervailing power to set prices of private providers closer to the marginal benefit of the goods or services they provide and pass on those cost savings to citizens. In contrast, in the United States, healthcare provision is mainly done through the private sector, and only in certain submarkets does the government administer health insurance.

At the same time in the United States, there have been dramatic changes in antitrust and patent law. Since the late 1970s, the Antitrust Division of the Department of Justice (DOJ) and the courts have reinterpreted existing antitrust law to increasingly allow firms to reduce competition through merging with or acquiring competing firms (Gallo et al., 2000; Peltzman, 2014; Stelzner and Chaturvedi, 2020). For example, in 1982 and 2010, the DOJ dramatically redefined its definition of Section 7 of the Clayton Antitrust Act – the main federal law on mergers and acquisitions between competing firms.[5] These changes in the definition of the law opened up the possibility of horizontal mergers or acquisitions that were previously understood to "lessen competition, or tend to create a monopoly," as deemed illegal by the Clayton Antitrust Act.[6] Despite these substantial revisions of antitrust law, Stelzner and Chaturvedi (2020) show that the DOJ has been even more permissive in allowing firms to decrease competition than specified in their own definition of anti-competitive behavior.

Likewise, Congress has changed patent law which has increased the market power of patent holders (Allison and Lemley, 1998; Quillen Jr, 2006; Scherer, 2009; Baker, 2016). A patent is ownership of some form of intellectual property, like the formula for making a prescription drug or the design of a medical device, which allows the patent holder to exclude other firms from producing the good for a specified period of time. In 1982, Congress moved oversight of patent cases to the United States Court of Appeals for the Federal Circuit which has proven much friendlier to patent holders. In 1984 and 1995, Congress increased the duration a patent holder could exclude others from competition from 10 to 13 years to 17 to 20 years. At the same time, the DOJ has decreased the degree to which it contests patent licensing agreements that reduce competition through stipulation of minimum prices.

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[5] These can be seen in the Horizontal Merger Guidelines (HMGs) issued by the DOJ in 1982 and 2010 compared to that issued in 1968. For discussion changing definition of horizontal merger law, see Stelzner and Chaturvedi (2020). For actual HMGs, see the DOJ website: https://www.justice.gov/atr/merger-enforcement.
[6] 64 Stat. 1125 (1950), 15 U.S.C. § 18 (1958), amending 38 Stat. 731 (1914).

These changes in antitrust and patent law have allowed firms to increase their market power and thus increase the price of the goods and services they sell. Thus, the United States has created a healthcare system where the government doesn't regulate the prices of medical goods and services, either by setting them directly or through utilizing countervailing power, and, at the same time, has increasingly let firms in healthcare, and other sectors of the economy, increase their market power through limiting market competition.

While these developments in the structure of the national healthcare system and the administration of antitrust and patent laws are important, most macro-studies that look at the comparative cost of healthcare in the United States and other developed countries do not clearly identify the importance of unchecked market power. For example, Woolhandler et al. (2003) compare the administrative costs of medical insurance, hospitals, nursing homes, physician groups, and home care in the United States and Canada. Despite change in technology, they find that administrative costs accounted for 31.0 percent of public and private health care expenditures in the United States. In contrast, administrative costs only account for 16.7 percent of health care expenditures in Canada. Woolhandler et al. argue that these substantial differences in administrative costs stem from the relative importance of private insurers, the greater number of insurers, and the lack of global-budgeting systems in the United States.[7]

In a similar vein, Himmelstein and Woolhandler (2012) compare Medicare expenditures in the United States with Canadian Medicare expenditures for those over 64 years of age. They find that between 1980 and 2009 real Medicare spending in the United States increased by 198.7 percent per enrollee – compared to only 73.0 percent per enrollee over the same period in Canada. Himmelstein and Woolhandler attribute the differences in Medicare expenditure to differences in administrative costs, the lack of global-budgeting in the United States, a higher proportion of primary care practitioners in Canada, difference in government's willingness to act as a countervailing power to reduce prices for consumers, and a difference in the prevalence of malpractice suits.

While Woolhandler et al. (2003) and Himmelstein and Woolhandler (2012) rightfully point at the high cost of administration overhead in the United States, they do not clearly unpack the numerous causal factors driving up administrative costs. At the same time, they seem to

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[7] A global-budget system, which exists in Canada and not the United States, is where hospitals and the government negotiate annual expenditures for hospitals.

ignore (in the case of Woolhandler et al., 2003) or only briefly mention (in the case of Himmelstein and Woolhandler, 2012) the importance of change in market power of different subsectors of the healthcare industry. Indeed, many of the reasons they list for greater administrative costs could stem from greater market power and the ability to wield it for private benefit. For example, a larger number of insurers in the United State would mean that the market power, and thus the prices, of healthcare providers would be more unchecked. Also, the greater importance of private insurers would mean that the benefits from an insurer acting as a countervailing power would not necessarily be passed on to consumers. Lastly, the lack of global-budgeting in the United States really shows the greater market power of hospitals compared to medical insurance providers. Thus, Woolhandler et al. (2003) and Himmelstein and Woolhandler (2012) do not clearly identify the importance of market power in the comparative costs of healthcare in the United States and Canada.

To be sure there are some macro-studies that have pointed to the importance of market power. For example, Baker (2016) calculates the degree to which prescription drugs are overpriced as a result of the market power granted to pharmaceutical companies through patents. He calculates that rents on prescription drugs grew from 0.1 percent of GDP in 1980 to somewhere between 1.8 and 2.1 percent in 2018. Indeed, a number of authors have identified comparative patent protection and prescription drugs prices as a key explanation for differences in expenditure on healthcare across countries (for example, see Atkinson, 2002; Garattini et al., 2008; Mansfield, 2014; Garattini et al., 2016; Miller, 2018).

In Figure 1, we reproduce data on consumer price indices for prescription drugs between 1990 and 2016 for the United States, Canada, France, and Japan. As we can see, the price of prescription drugs in the United States has grown much faster than in other developed countries – paralleling the change in comparative healthcare expenditure overall. Between 1990 and 2016, prescription drug prices in the United States increased by 277 percent on average. Over the same period, prescription drug prices only increased by 57 percent in the United Kingdom, 13 percent in Canada, and actually decreased in France and Japan. As explained above, the United Kingdom, Canada, France, and Japan all regulate prices of prescription drugs either directly or indirectly through the countervailing power of government as the main national health insurer. In contrast, the United States has empowered pharmaceutical companies by giving them increased patent protection and deregulating antitrust laws.

Figure 1: Comparative Drug Prices
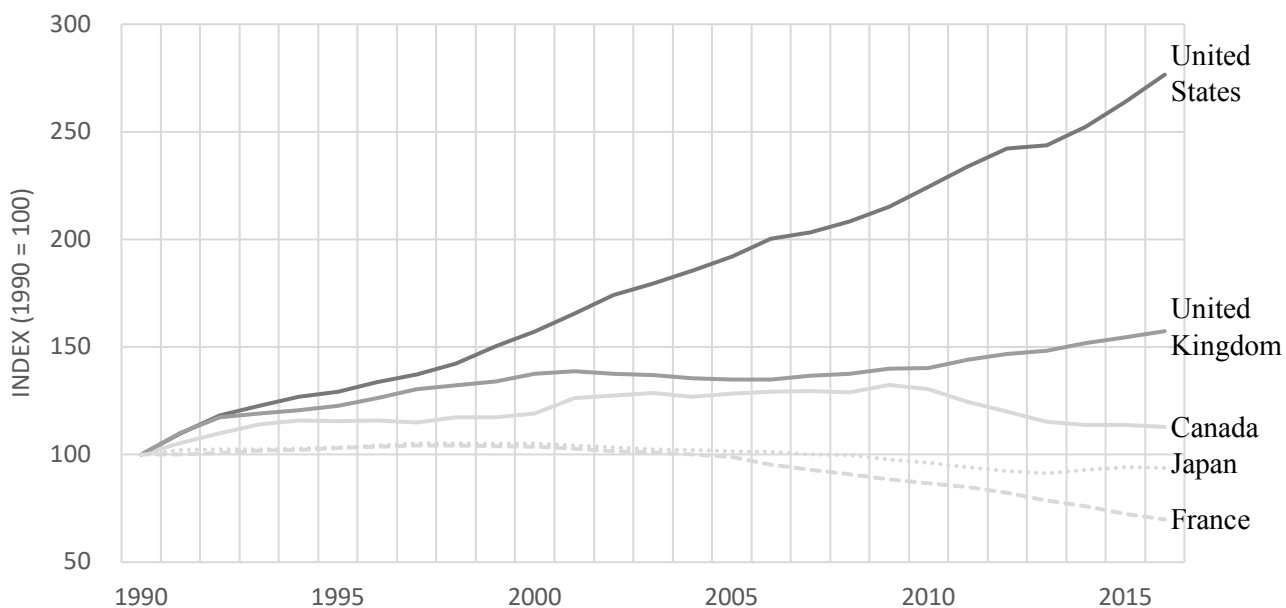
Source: Data from the Federal Reserve Bank of St. Louis, the Office for National Statistics in the United Kingdom, the Institute of National Statistics and Economic Studies in France, and the Statistics Bureau of Japan.

While all of these studies are important for conceptualizing the importance of market power of pharmaceutical companies in the United States and understanding difference in healthcare expenditure, they don't explore other subsectors of healthcare. However, the change in antitrust laws, which allowed firms in other subsectors of healthcare to increase their market power, are as important as the change in patent laws.

In contrast to the macro studies, there is a large and growing literature on the micro effects of market concentration in the different subsectors of healthcare. As we will see below, these studies overwhelmingly show that increased concentration in hospitals, physician groups, and medical insurances leads to an increase in the price of the services provided by firms in these subsectors of healthcare. However, these micro studies have not yet been brought together to create a macro picture of the importance of market power in increasing the cost of and thus expenditure on healthcare in the United States.

In this paper, we try to more fully identify the importance of market power in understanding comparative healthcare expenditure by analyzing change in concentration and how concentration affects the price of medical goods and services in the four largest subsectors of healthcare expenditure (hospitals, physician groups, prescription drugs, and medical insurance). Utilizing the literature on comparative drug prices and that on the micro effects from change in concentration and growth accounting, we project a trend for what costs would have been from 1980 until 2016 if the changes in antitrust and patent law, highlighted above, had never taken place. We find that the annual rent from the increase in market power of hospitals, physician groups, prescription drugs, and net medical insurance reaches between 2.47 and 4.30 percent of GDP in 2016 – truly a big cost for big medicine. These values go a long way in explaining why Americans pay so much for healthcare and achieve relatively less in terms of comparative health outcomes, and they point for a clear path to reducing the cost of healthcare.

Hospital consolidation and price change

As a result of the change in interpretation and administration of antitrust law highlighted above, hospital consolidation has increased. Gaynor (2011) and Fulton (2017) calculate the Herfindahl-Hirschman Index (HHI) for hospitals. A commonly used measure for market concentration, HHI is the sum of the square of market shares of all producers in an industry.[8] They define a market as a metropolitan statistical area (MSA) with a population of less than three million.[9] Gaynor and Fulton then calculate average hospital market concentration for the United States as a whole weighing each MSA based on its population. The results are displayed in Table 1. As we can see, hospital consolidation increased from the late 1980s through 2016 with the most dramatic changes taking place in the mid-1990s and, especially, in the late 2000s. These values of HHI signify that an average MSA had between four and five hospitals in 1987. However, by 2016, on average, metropolitan statistical areas in the United States had less than two hospitals. Clearly this would mean a dramatic decrease in competition.

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[8] HHI= $\sum_{i=1}^{N} i^2$. i is the market share of the ith firm in the industry. N is the total number of firms. Market shares always sum to 100: $\sum_{i=1}^{N} i = 100$. Thus, if N=1, i.e. there is a pure monopoly, the HHI of the industry is 10,000. In perfect competition, where it is assumed that each firm has an infinitesimal market share, the HHI for any industry is zero.

[9] Gaynor (2011) leaves out MSAs with a population of more than three million because large cities may have multiple hospital markets for their constituents inside the same MSA.

Other economists have found similar results. For example, Vogt and Town (2006) calculate average HHI by region in 1990 and 2003. These results are replicated in Table 2. As we can see, they arrive at a similar conclusion – hospital concentration has increased significantly. Indeed, from Vogt and Town's data, we can see that some regions, like the South, started from a higher level of concentration in 1990 and have seen more dramatic increases in concentration. For the nation as a whole, Vogt and Town find that the market concentration has increased from an average HHI of 1,576 in 1990 to 2323 in 2003.

Table 1: Hospital Concentration in the United States, 1987 – 2006

Year	Mean HHI	Change
1987	2,340	
1992	2,440	100
1997	2,983	543
2002	3,236	253
2006	3,261	25
2010	5,500	2,239
2016	5,775	250

Source: Gaynor (2011) and Fulton (2017).

Table 2: Changes in Hospital Concentration by Region, 1990 - 2003

Region	Mean HHI in 1990	Mean HHI in 2003	Change
East	1,285	1,982	697
Midwest	1,613	2,356	743
South	2,077	3,016	939
Southwest	1,820	2,494	674
West	1,694	2,242	548

Source: Vogt and Town (2006).

This increase in hospital concentration has led to an increase in the price of services provided by hospitals. In Table 3, we summarize empirical results from micro-studies on the

effect on hospital prices from increased consolidation. For each study, we provide data on the period and geography covered and distil their final results. As we can see, although different studies find different intensities of price change, all find that an increase in hospital concentration leads to an increase in hospital prices. These studies use a number of different methods from event studies of price increases from a merger and acquisition in a single market to broad statistical studies looking at the relationship between hospital prices and concentration across time and county or MSA while controlling for other variables that might affect price (like quality of healthcare provision, concentration of medical insurance companies in the same area, the amount of Medicare and Medicaid patients, etc.).

Table 3: Impact of Hospital Market Concentration

STUDY	AREA OF STUDY	PERIOD OF STUDY	CHANGE IN CONCENTRATION	PRICE CHANGE
HAAS-WILSON & GARMON (2011)	Chicago	1990-2003	ΔHHI:384	+20%,
TENN (2011)	California	1999-2003	Post-merger combined market share of 50%	+28.4%~44.2%
CAPPS & DRANOVE (2004)	San Diego	1997-2001	ΔHHI:1000	+6.6%
COOPER, CRAIG, GAYNOR, & VAN REENEN (2015)	US	2007-2011	ΔHHI:833 ΔHHI:2500 ΔHHI:7500	+4.8% +6.4% +15.3%
DAFNY (2009)	US	1989-1996	ΔHHI:1667	+40%
KEELER, MELNICK, & ZWANZIGER (1999)	California	1986-1994	ΔHHI:200 ΔHHI:800	+4.5% +7.3%

Source: Authors compilation of literature.

For example, Dafny (2009) calculates the price effects on rival hospitals rather than the merging hospitals to address selection problems and finds that nearby rival hospitals also raise prices when competitors merge. The relationship between market concentration and prices is even robust across types of hospitals (Keeler et al., 1999; Simpson and Shin, 1997; Dranove and

Ludwick, 1999; Capps et al., 2003; Gaynor and Vogt, 2003). For example, Keeler et al. (1999) find that both non-for-profit and for-profit hospital mergers lead to an increase in prices. Indeed, they find that non-for-profit mergers lead to higher prices and that the price increases resulting from a non-for-profit merger are increasing over time.

As can be seen from Table 3, the price effect from a given change in concentration can be incredibly high. For example, Hass-Wilson and Garmon (2011) find that an increase in HHI of 384 points in a hospital market leads to a twenty percent increase in hospital prices. Likewise, Tenn (2011) finds that a merger which resulted in a hospital with a market share of fifty percent increased prices by 28 to 44 percent. While a few studies have found much smaller price effects, some of these findings might be statistically biased. For example, Cooper et al. (2015) calculate the price effect from consolidation using dummy variables for monopoly, duopoly, and triopoly. At the same time, as a proxy for quality of healthcare provision, they control for the number of hospital beds. However, it is unclear how more beds represent better quality, and, it is possible that this more flexible variable is picking up some of the price effect from their rigidly constructed dummy variables for concentration. If this was the case, their value for the price effect from an increase in concentration would be downwardly biased.

These studies have uncovered several other interesting results. For example, Gaynor et al. (2015) find no significant relationship between clinical quality of services provided at hospitals and prices in the United States. A report by the Office of the Attorney General of Massachusetts (2010) finds that the large price variation inside the state is not correlated with quality of health services. Likewise, a report by Pennsylvania Healthcare Cost Containment Council (2007) finds the same for the price and quality of heart surgery in Pennsylvania. While other studies have found mixed results in the connection between price and quality (for example, see Cooper et al. (2015)), these findings show, like with the divergent national trends in healthcare expenditure and outcomes highlighted in the introduction, that higher quality is not the central reason for variation in hospital prices.

Physician consolidation and price change

Like with hospitals, physician groups have consolidated as a result of the change in interpretation and administration of antitrust laws. For example, Liebhaber and Grossman (2007) present data, depicted in Table 4, on the percentage of physicians practicing in groups of

different sizes between 1996 and 2005 in the United States. As we can see, although solo or two- physician practices are still the most common, the percent of physicians located in solo or two-member groups decreased between 1996 and 2005. Likewise, the number of physicians working at practices with between three and five physicians has also decreased. On the other hand, more and more physicians are working at large practices. For example, the percent of physicians in practices that contain between six and fifty physicians increased from 13.1 percent in 1996 and 1997 to 17.6 percent in the mid-2000s. And the number of physicians in practices with more than fifty members have increased from 2.9 percent to 4.2 percent of all physicians over the same period.

Table 4: Physicians groups by size, 1996 – 2005

PHYSICIANS IN PRACTICE	1996 – 1997	1998 – 1999	2000 – 2001	2004 – 2005
1 – 2	40.7%	37.4%	35.2%	32.4%
3 – 5	12.2%	9.6%	11.7%	9.8%
6 – 50	13.1%	14.2%	15.8%	17.6%
> 50	2.9%	3.5%	2.7%	4.2%

Source: Libhaber and Grossman (2007).

These changes in the composition of physician groups have led to very high levels of concentration. For example, Schneider et al. (2007) calculate the concentration of physician groups across counties in California in 2001. They find a third of the counties in California have physician group markets with an HHI between 1800 and 3600 and a half have an HHI of greater than 3600 with an average county HHI for physician organizations of 4,430. For the nation as a whole, Fulton (2017) finds that primary care physician groups by MSA increased their concentration from an HHI of around 1800 in 2010 to an HHI above 2300 in 2016 – an increase of 29 percent. In contrast, specialist physician groups have seen their HHI increase by only five percent between 2010 and 2016, but concentration there started from a much higher level. Indeed, in 2016, specialist physician groups by MSA had an average HHI of around 3400 – which represents less than three groups for a given specialty competing for clients in an MSA.

Like with hospital concentration, a number of studies have shown that an increase in concentration in physician group markets results in an increase in price for physician services.

To get an idea of the literature, in Table 5, we summarize several of the studies including information on geography and period of study and distill the final results from each. As we can see, while there is variation in the degree of the effect, each finds a positive relation between change in concentration and price in the physician group markets.

Table 5: Impact of Physician Market Concentration on Prices

STUDY	AREA OF STUDY	PERIOD OF STUDY	CHANGE IN CONCENTRATION	PRICE CHANGE
SCHNEIDER ET AL. (2007)	California	2001	ΔHHI: 1%	+1 to 4 %
DUNN AND SHAPIRO (2014)	United States	2005 – 2008	ΔHHI: 10%	+0.5 to 1%
BAKER ET AL. (2014)	United States	2010	ΔHHI: 1000	+2.0 to 6.5%
AUSTIN AND BAKER (2015)	United States	2010	ΔHHI: lowest to highest-HHI quartile counties	+13 to 26%
CARLIN ET AL. (2016)	Minneapolis-St. Paul	2007-2011	ΔHHI: 53	+14 to 20%[10]

Source: Authors compilation of literature.

Some of the difference in price effects comes from differences in the definition of a market. This is also true for the studies reviewed in Table 3. For example, Baker et al. (2014) and Austin and Baker (2015) define the market for physician services as the county in which they are located – meaning that healthcare consumers consider the prices of all providers in their county. In contrast, Carlin et al. (2016) define their market as the twin cities – Minneapolis and St. Paul – which represent a small, but densely populated, area of two counties. Calculating HHI from a geographic area larger than that analyzed by consumers when considering services from physician groups would tend to underestimate concentration. At the same time, drawing the market larger than consumers do in practice could also blur the price effect from concentration and underestimate the perceived price change from a merger or acquisition. Curiously, Baker et al. (2015) have more fine grain data but don't explore the implications of changing the definition

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[10] This is the combined effect from a vertically integrated delivery system, a hospital that owns a number of physician groups, acquiring more physician groups – i.e. from both a vertical and horizontal consolidation.

of a given local market. Instead, they use data at the zip code level to average across counties, so their county HHI is a double average.

Some of the difference in price effects, in both Table 3 and 4, could also stem from the construction of concentration variables and the controls used. For example, Baker et al. (2014) and Austin and Baker (2015) calculate HHI by county and organize them into quartiles. They then use a dummy variable for quartile as the independent variable for concentration. At the same time, Baker et al. and Austin and Baker include a control for the number of specialists per population per county. However, these two variables are potentially highly correlated, and given the rigid structure of the concentration dummy, it is likely that the control variable is picking up some of the activity from differences in concentration at the county level. At the same time, they don't control for the concentration of insurers in the area. Physicians' group ability to exercise market power from a given level of concentration is also dependent on the level of concentration on the other side of the market – the medical insurers in this case.

Insurance consolidation and price change

Like with hospital and physician group markets, medical insurance has also seen an increase in concentration. For example, Dafny (2015) calculates the national market share of the top five medical insurers from 2006 through 2014. The results are displayed in Figure 2. As we can see, even if insurance markets are defined nationally, there is significant concentration, and concentration is increasing. However, as pointed out by Dafny and implied by our previous discussion, these figures underestimate the degree of insurance concentration because most medical insurance markets are local or, at least, regional.

To look at medical insurance concentration from another angle, Dafny (2010) calculates market concentration for medical insurance for fully insured employees at large companies in the United States between 1998 and 2009. The results are displayed in Table 6. As we can see, this series shows both that market concentration has been increasing over a longer period and that concentration is higher when we more accurately define the market. Indeed, market concentration for medical insurance for fully insured employees at large companies increased from an HHI of 2,984 in 1998 – an already high degree of concentration – to 4,126 in 2009 – a value of concentration representing something very close to a duopoly for medical insurance markets in the United States. This is essentially twice as high as when markets are assumed to

be national, as in Figure 2. For example, the market share of the top five national firms in 2006 would yield an HHI of 1708 – compared to an HHI of 4072 for the same year when markets are defined by analyzing the options confronting large employers.

Figure 2: Estimated National Market Shares of the Top Five Medical Insurers, 2006 – 2014
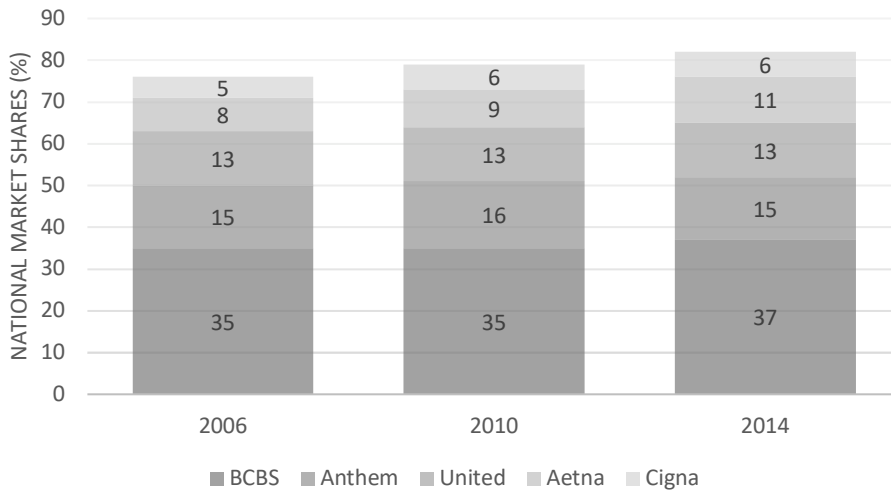
Source: Dafny (2015).

Table 6: Fully Insured, Large Employer Insurance Market Concentration, 1998 - 2009

Year	Mean HHI	Change in HHI
1998	2,984	--
1999	2,835	-149
2000	3,092	+257
2001	3,006	-86
2002	3,158	+152
2003	3,432	+274
2004	3,706	+274
2005	3,951	+245
2006	4,072	+121
2007	4,056	-16
2008	4,201	+145
2009	4,126	-75

Source: Dafny (2010).

Increased concentration in medical insurance markets leads to a decrease in prices paid to medical providers (Cooper et al., 2015; Moriya et al., 2010; Dafny et al., 2011 and 2015; Ho and Lee, 2017). For example, Dafny et al. (2011) shows that a merger in the insurance market reduces physician earning growth by three percent. Ho and Lee (2017) show that after two insurance companies combined, hospital prices fell as the remaining insurers exercised increased monopsony power, and Moriya et al. (2010) show that an increase in HHI of 1000 reduces purchase prices by 8.4 percent, and an increase in HHI of 800 decreases hospital prices by 6.7 percent.

However, these cost savings do not translate into a reduction in premiums paid by consumers. In Table 6, we summarized the change in premium effects from a change in concentration of medical insurers. As we can see, except for the special case highlighted by Ho and Lee (2017),[11] increases in concentration, even when they decrease the cost of medical care, lead to economically significant increases in the cost of premiums. For example, Dafny et al. (2012) find that an increase in HHI of 698 is associated with a seven percent increase in premiums.[12]

Much of the difference in the estimated price effects of changes in concentration of medical insurance stem from differences in the size of employers making up the samples. For example, Dafny et al (2012) look at the medical insurance market and premium paid for large employers. In contrast, Guardodo et al (2013) data is primarily composed of small employers. Smaller employers would have less leverage to wield against insurance companies; thus, the price effect from an increase in competition are likely to be greater. Indeed, Ho and Lee (2017) find this exact result. An increase in state level HHI in medical insurance markets of 3547

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[11] This is the case where increased concentration leads to insurance companies passing on some of the benefits from decreased cost via exercising monopsony power. However, given trends in the cost of net medical insurance, premiums minus costs, and given other studies on the subject, it doesn't seem that this case is common in the United States.

[12] To some degree recent changes in law have put an upper limit on medical insurers' ability to increase premiums even in the face of decreasing cost of medical care. Under the Affordable Care Act of 2010, insurers are required to spend at least 80 percent of their premiums on medical care. However, both Obama and Trump granted some waivers allowing for certain insurers to spend less than the required 80 percent.

increases premiums on average by 19.3 percent. In contrast, when faced with large employers, Ho and Lee find that the price of premiums would only increase by 11.0 percent.

Table 6: Impact of Medical Insurance Concentration on Prices

STUDY	AREA OF STUDY	PERIOD OF STUDY	CHANGE IN CONCENTRATION	PRICE CHANGE
ROBINSON (2004)	United States	2000 – 2003	ΔHHI: 340	+3.65%[13]
DAFNY ET AL. (2012)	United States	1998 – 2006	ΔHHI: 698	+7.0%
GUARDADO ET AL. (2013)	Nevada	2008	ΔHHI: 651 – 1140	+13.7 to 14.7%
HO AND LEE (2017)	California	2004	ΔHHI: 1403 ΔHHI: 3547	-3.4 to +11.0% +16.6 to 19.3%

Source: Authors compilation of literature.

Estimating the Cost of Big Medicine

Thus, there has been dramatic changes in concentration across the many subsectors of healthcare which have increased prices of hospital and physician group services and premiums for medical insurance. Like with the change in patent law and prescription drug prices, these developments are central for understanding the increase in cost of healthcare in the United States. In this section, we bring all this information together and calculate the amount Americans have overpaid for private healthcare between 1980 and 2016 because of price movements stemming from increased market power of hospitals, physician groups, medical insurance carriers, and pharmaceutical companies. To do this, we set up a basic growth accounting framework to compute a counterfactual for what price movements would have been if antitrust and patent laws had not seen the changes highlighted above. The rent – the degree to which Americans have overpaid – is the difference between the actual series and the counterfactual.

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[13] The calculation of change in insurance premiums for Robinson (2004) comes from their calculation of the average yearly ratio of medical costs to premium revenues for insured products for major health plans between 2000 and 2003 combined with our calculation of the change in concentration faced by big employers over the same period.

We can estimate the counterfactual for the rate of change of healthcare expenditure by subsector, $\hat{\varphi}_{counterfactual}$, by subtracting out the increase in price from increased market power.

$$\hat{\varphi}_{counterfactual} = \hat{\varphi}_{Actual} - \hat{P}_{\uparrow MP} \tag{1}$$

Data on the actual rate of change in healthcare expenditures by sector, $\hat{\varphi}_{Actual}$, comes from the Center for Medicare and Medicaid Services.[14] Data on the rate of change in price from change in market power, $\hat{P}_{\uparrow MP}$, comes from imputing a series using the micro-studies on the price effects from a change in concentration in a given subsector multiplied by data on actual change in concentration. In terms of the latter, we use the data highlighted above from Dafny (2010), Gaynor (2011), and Fulton (2017) to create series for the change in concentration in hospitals, physician groups, and medical insurance markets. For the price change effect from a given change in concentration, we use the low, median, and high values from the studies surveyed in Table 3 (for hospitals), Table 5 (for physician groups), and Table 6 (for medical insurance).[15]

For prescription drugs, we use price change data for pharmaceutical drugs in the United Kingdom, Canada, and Japan as the lower bound, median, and upper bound effects. As explained above and depicted in Figure 1, these countries directly set prices or bargained with private companies to stymie or slow the increase in price of prescription drugs. In contrast, the United States has granted pharmaceutical companies more market power through statute, adjudicative, and administrative change in patent and antitrust law. These different systems have led to wildly different prices for the same drugs across countries. Thus, using price change data

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[14] https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/index.html.

[15] Scaling the results on price found in micro studies to calculate the aggregate effect over the last forty years has some problems. For example, in each of our three counterfactual estimates, the price effect from a given change in concentration is constant across levels of concentration. However, a basic Cournot N-firm model or a multiperiod limited capacity and price competition Bertrand model of concentration and pricing yield a price effect from concentration that grows as concentration grows. At the same time, scaling using growth accounting provides a good estimate for a number of reasons. First, as mentioned above, our counterfactuals for a given subsector stem from estimates of the change in price from a change in concentration in the same subsector. Second, most of the studies we survey are nationally representative. Third, as also mentioned above, we provide three counterfactuals based on different price effects to give a broad view of the aggregate effect from increased market power in healthcare.

for prescription drugs from other advanced industrialized countries allows us to see what prices could have been if we had followed a strategy of curbing the market power of pharmaceutical companies.

Using actual spending in 1980 as the starting point and the counterfactual series on the rate of change of expenditure if patent and antitrust laws had not changed, we calculate the nominal and real counterfactual series for national health expenditure by subsector. In Figures 3 through 6, we display these estimates, for the lower bound, median, and upper bound price effects, for hospitals, physician groups, net insurance, and prescription drugs in real 2016 dollars. The solid line in each represents actual, national, private health expenditure in the respective subsector. The dotted lines represent the estimates for what national, private health spending would have been if the United States had not seen the changes in antitrust and patent laws highlighted above. The counterfactual series closest to the actual series uses the lower bound estimate for the effect of a change in concentration on price. The thicker dotted line uses the median effect of a change in concentration on price, and the counterfactual series farthest from the actual expenditure series uses the upper bound effect from the tables above.

Figure 3: National, Private Hospital Expenditure – Actual and Counterfactual
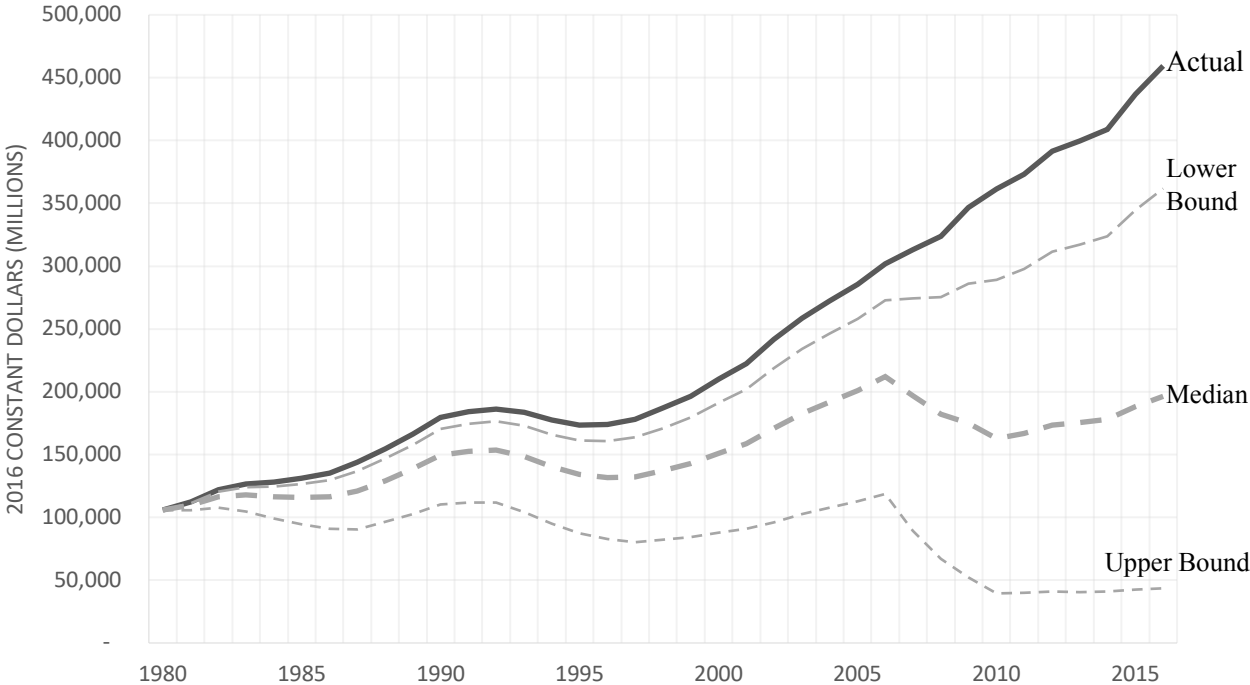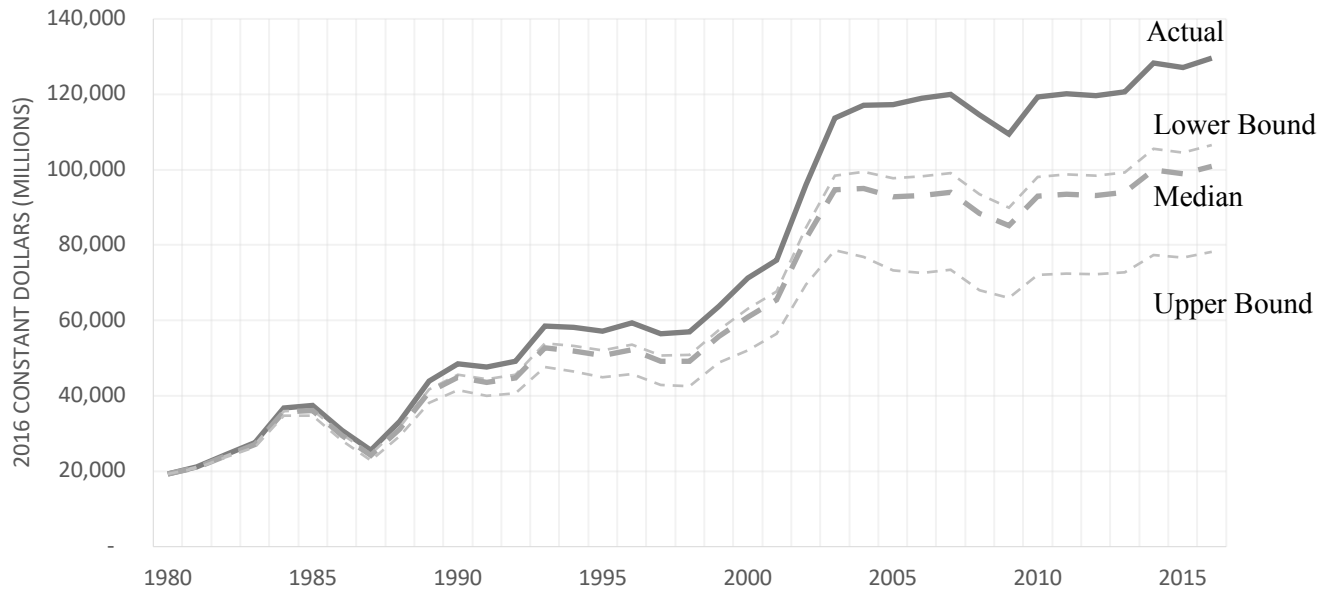

Source: authors.

Figure 4: National, Private Physician Expenditure – Actual and Counterfactual
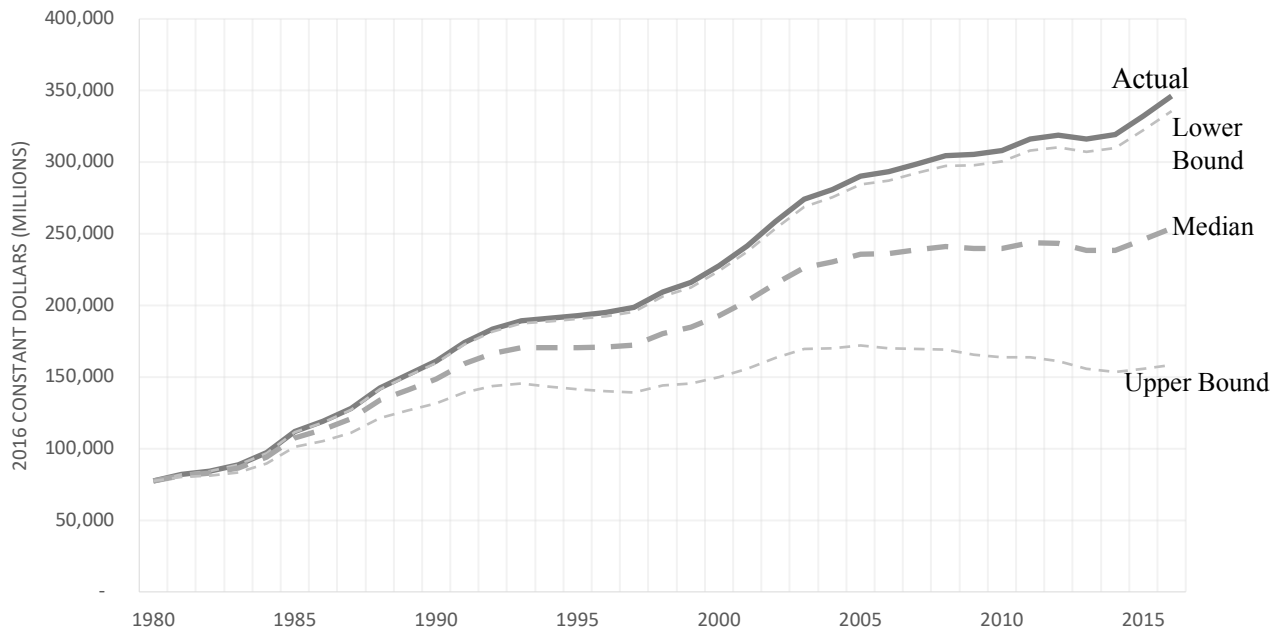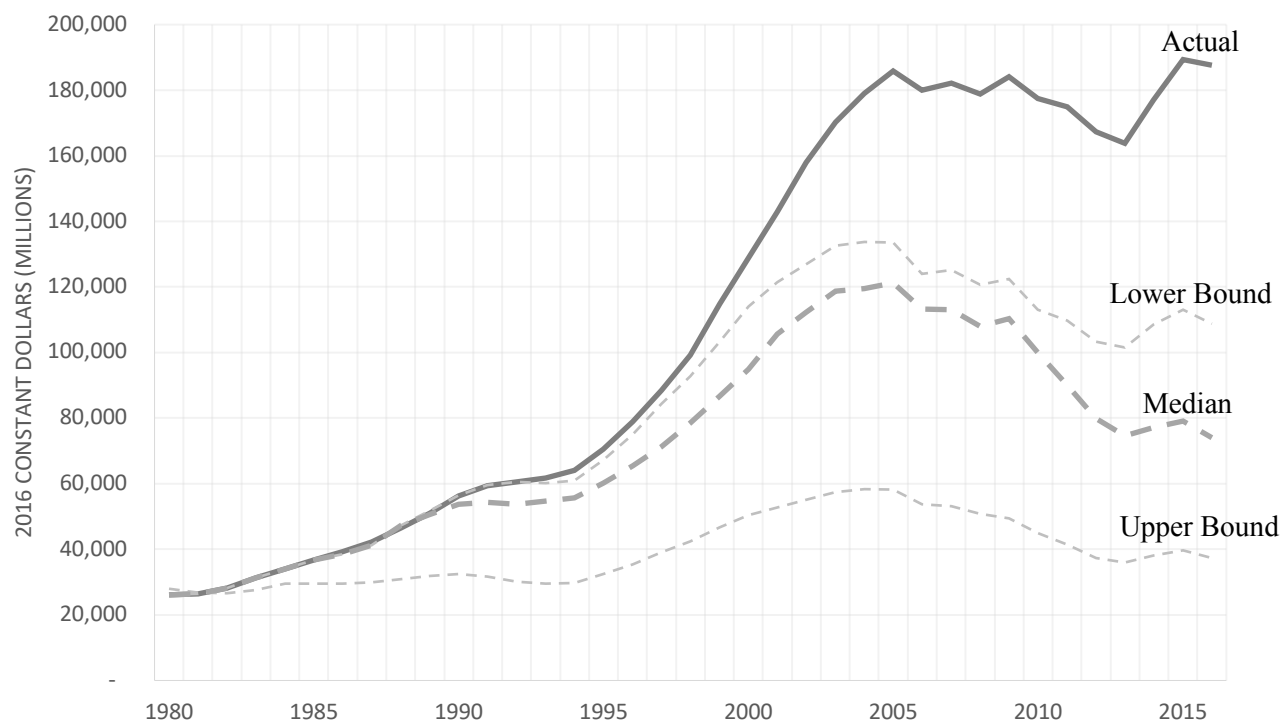

Source: authors.

Figure 5: National, Private Medical Insurance Expenditure – Actual and Counterfactual

Source: authors.[16]

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[16] Figure 5 only shows the change in cost of premium from change in concentration. Thus, it doesn't completely show the degree to which medical insurance companies are able to create a wedge between the cost of medical

Figure 6: National, Private Prescription Drug Expenditure – Actual and Counterfactual

Source: authors.

As can be seen in Figures 3 through 6, the estimates using the lower bound effect from concentration differ significantly from those using the median and upper bound effect. Indeed, in the case of hospital and physician group expenditures, the estimates using the lower bound effect are not much different from the actual. However, as mentioned above, the estimates for the lower bound effect from concentration on price are problematic. For example, for hospitals and physician groups, the lower bound counterfactual comes from using Cooper et al. (2015) and Baker et al. (2014), respectively. Both of these studies construct rigid independent variables for concentration and include other, more flexible controls that are likely highly correlated with concentration. For example, Cooper et al. include a control for number of hospital beds as a proxy for quality of service. However, it is not clear how the number of beds proxies for quality, especially given their other controls for quality, and the number of beds is likely to be correlated

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care and that of insurance premiums. The other side, the reduce in prices the insurance companies pay for medical care for insurees, would just represent a transfer between medical insurance and other subsectors of healthcare and not an increase cost for consumers.

with concentration. Likewise, Baker et al. include a control for number of specialist physicians per population in a given county. This control is also likely highly correlated with concentration and thus downwardly biasing their estimates on the effect of concentration on prices.

If we look at the median and upper bound effect from concentration on prices, without the changes in law and the resulting changes in price, private national health expenditures would have been much less. Indeed, using the median effect of concentration on prices, the rent accruing to hospitals, physician groups, medical insurance carriers, and prescription drugs companies reaches 1.41, 0.49, 0.15, and 0.42 percent of GDP in 2016 – cumulatively 2.47 percent of GDP. Using the upper bound effect of concentration on prices, the rent accruing to hospitals, physician groups, medical insurance carriers, and prescription drugs companies reaches 2.22, 1.00, 0.27, and 0.80 percent of GDP in 2016 – cumulatively 4.30 percent of GDP.

While counterfactuals using the median and upper bound effect of concentration on prices are economically significant, even the upper bound calculations for the rent in healthcare most likely underestimates total rents for several reasons. First, we have not calculated rents in all subcategories of healthcare (for example in durable and nondurable medical equipment, in nursing care, in the public provisions of medical care, etc.) In terms of the former, medical equipment has also benefited from the change in antitrust and patent laws. In terms of the latter, the private elements of Medicare – like Medigap and Medicare Advantage – have also seen increases in concentration and corresponding increases in price. Second, the price effects highlighted above do not include change in quality from increased concentration – a secondary way to utilize market power. Indeed, many studies have found a negative relationship between concentration and quality. For example, Kessler and McClellan (2000) and Kessler and Geppert (2005) find that increased market concentration significantly increases mortality. Third, the figures above do not include the negative effects from misallocation of resources. For example, the huge rents to be earned through consolidation or through winning a patent incentivizes medical providers to dedicate significant resources to lawyers to usher patent cases through the courts and to probe the many exceptions to the Department of Justice's Horizontal Merger Guidelines. These investments represent resources diverted from other activities that might be more beneficial to society. Also, none of these studies defines markets at the zip-code level – which is more likely to represent the actual market considered by an individual and would yield a higher level of concentration in each subsector.

Conclusions

As we have seen, as a result of change in patent and antitrust laws and the private nature of our healthcare system, firms in the different subsectors of healthcare have increased their market power and thus prices. These changes in price and thus expenditure represent a significant rent accruing to hospitals, physician groups, pharmaceutical companies, and medical insurers. Thus, they go a long way in explain why we pay so much for healthcare in the United States. To better conceptualize this point, in Figure 7, we display data on total healthcare spending by country, for the United States, the United Kingdom, Canada, France, and Japan, as a percentage of GDP between 1970 and 2016. For the United States, we include data on actual expenditure and two counterfactual series – one using the median effect and one using the upper bound effect from a change in concentration on prices. As we can see, if we had not remade antitrust and patent laws and instead utilized the government as a countervailing power, national health expenditure in the United States would have been much closer to other advanced industrialized countries.

Figure 7: Total Healthcare Spending as a Percentage of GDP
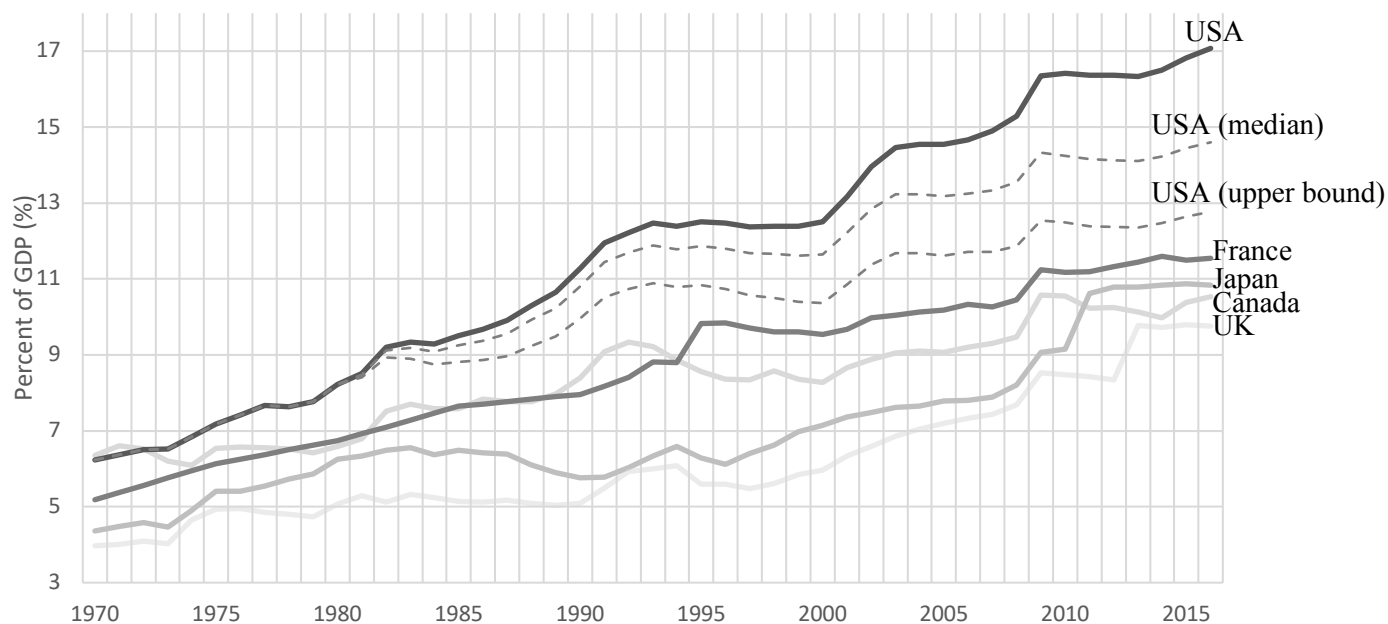
Source: Actual spending on healthcare by country comes from the OECD database.

The policy implications from this study are clear; if we want to create a system that is more cost effective, we need to curb the market power of healthcare providers, as has been done in other developed countries. This can be accomplished through government taking the role of medical insurer – a Medicare for all option. The government would then be able to use its countervailing power to reduce the cost of healthcare and pass those benefits on to citizens. The government could also increase the regulation of antitrust laws and reduce the power of patent holders. However, to completely reduce costs through this second avenue, the government would have to reduce firm size in all subsectors of healthcare – potentially a much more difficult option. Whatever the strategy taken, we have seen that the potential savings is very large – between 2.47 and 4.30 percent of GDP in 2016. Thus, action is needed now.

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