

# Health Care Industry Consolidation

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by

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## 1 Introduction

Health care is a very large and important industry. Hospital and physician services are a large part of the U.S. economy. In 2009, hospital care alone accounted for 5.4% of GDP – roughly twice the size of automobile manufacturing, agriculture, or mining, and larger than all manufacturing sectors except food and beverage and tobacco products, which is approximately the same size. Physician services comprise 3.6% of GDP (Martin et al., 2011). The net cost of health insurance – current year premiums minus current year medical benefits paid – was 1% of GDP in 2009. The share of the economy accounted for by these sectors has risen dramatically over the last 30 years. In 1980, hospitals and physicians accounted for 3.6% and 1.7% of U.S. GDP, respectively, while the net cost of health insurance in 1980 was 0.34% (Martin et al., 2011).

Of course, health care is important not only because of its size. Health care services can save lives or dramatically affect the quality of life, thereby substantially improving wellbeing and productivity.

As a consequence, the functioning of the health care sector is vitally important. A well functioning health care sector is an asset to the economy and improves quality of life for the citizenry. By the same token, problems in the health care sector act as a drag on the economy and impose a burden on individuals.

As documented below, there has been a tremendous amount of consolidation among health care providers. Consolidation has also been occurring among health insurers. Consolidation can bring efficiencies – it can reduce inefficient duplication of services, allow firms to combine to achieve efficient size, or facilitate investment in quality or efficiency improvements. On the other hand, consolidation can enhance the market power and lead to increased prices or reduced quality.

The research evidence shows that providers in more concentrated markets charge

higher prices to private payers, without accompanying gains in efficiency or quality. Further, the burden of higher provider prices falls on individuals, not insurers or employers. Even though individuals with private employer provided health insurance pay a small portion of provider fees directly out of their own pockets, they end up paying for increased prices in the end. Insurers facing higher provider prices increase their premiums to employers. Employers then pass those increased premiums on to their workers, either in the form of lower wages (or smaller wage increases) or reduced benefits (greater premium sharing or less extensive coverage, including the loss of coverage). There is less research evidence on the impacts of consolidation in health insurance markets, but that evidence shows insurers in more concentrated markets charge higher premiums to large employers, and pay lower prices to providers.

This represents a real, and serious problem. The U.S. health care system depends on private markets to deliver health care and for a large part of the financing of care. If these markets are not functioning well due to the exercise of market power this creates problems for the entire system.

## 2 Consolidation

While not a new phenomenon, there has been substantial consolidation in the health care industry in recent years. There was a large amount of consolidation in hospital markets in the 1990s. Consolidation activity slowed down starting around 2002, but has turned up in the past couple of years.

Figure 1 presents information on hospital merger and acquisition activity from 1998 through the first two quarters of 2011. As can be seen, there were a large number of mergers and acquisitions in the 1990s, with the pace slowing down in the early 2000s, and some pick up in activity in the past couple of years.

Some additional information is contained in Figure 2, which charts the number of hospitals that are members of systems from 2000 to 2009. Members of hospital systems are often jointly owned and operated, so can be considered to be one firm. As can be seen, membership has been increasing substantially over time, thereby diminishing the number of independent hospitals.

The Herfindahl-Hirschmann Index (HHI) is a measure of how concentrated shares are within a market, and is widely employed as a measure of market structure. The HHI is the sum of squared market shares in the market. It increases as market shares are more concentrated among a small number of firms. It reaches its maximum value of 10,000 for a monopoly (the square of the monopolist's market share of 100 percent), and reaches a minimum value when the market is equally divided.

Table 1 presents numbers for the population-weighted, Herfindahl-Hirschmann Index

for hospitals for selected years from 1987 to 2006.<sup>1</sup> Two things are clear from this table. U.S. hospital markets are highly concentrated and have become even more concentrated over time. From the table it is easily seen that hospital markets have become significantly more concentrated. In 1987, the mean HHI was 2,340 and by 2006 the HHI was 3,161 – an increase of over 900 points. In 1992, the mean hospital concentration levels (2,440) were (barely) below the recently updated Federal merger guidelines’ (Federal Trade Commission and Department of Justice, 1992) cut-off point for classifying a market as “Highly Concentrated” ( $HHI \geq 2,500$ ), but by 2006 the mean concentration level (3,261) rose to well above this threshold. Town et al. (2006) note that mergers and acquisitions are the primary reason for the increase in hospital concentration over this period.

To provide some context for these numbers, a market with 5 equally sized firms would have a HHI of 2,000, 4 equally sized firms would have an HHI of 2,500 and a market with 3 equally sized firms would have an HHI of 3,333. That is, the increase in the HHI over the last 20 years is the equivalent of moving from approximately 5 equally sized firms to a market with about 3 equally sized firms.

While hospital markets are highly concentrated on average, there is also wide variation in concentration. Figure 3 shows a scatterplot of the MSA level market concentration in 1990 and in 2006. This figure displays two phenomena. First, it shows the distribution of HHIs across MSAs. Most MSAs are “Highly Concentrated.” In 2006, of the 332 MSAs in the U.S., 250 had HHIs greater than 2,500. Second, it is clear from Figure 3 that the increase in hospital concentration was a broad phenomenon – the vast majority of MSAs became more concentrated over this period. Particularly striking is the number of moderately concentrated MSAs in 1990 that by 2006 had become highly concentrated.

An obvious question is why this wave of hospital consolidation occurred. Fuchs (2007) and others point to the rise of managed care as the principal factor driving this massive consolidation. A cursory glance at Figure 4 suggests this causal explanation. The idea is that the rise of HMOs introduced aggressive price negotiations between hospitals and health plans, thereby giving hospitals a strong incentive to acquire bargaining power through consolidation. The rise of HMOs during the 1990s is widely credited with significantly reducing health care cost growth, primarily through tough price negotiations (see, e.g., Cutler et al., 2000).

Early suggestive evidence is provided by Chernew (1995), who finds that in the 1980s there is a relationship between HMO penetration and the number of hospitals operating in the market. Dranove et al. (2002) examine data from the 1981 to 1994 and find a correlation between metropolitan area HMO penetration in 1994 and the change in market structure. However, Town et al. (2007) examine the change in hospital market

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<sup>1</sup>The table contains population weighted, averages for all but the largest Metropolitan Statistical Areas (MSA)(based on admissions). The sample is limited to those MSAs with a population less than 3 million in 1990 because it is likely there are multiple hospital markets in MSAs larger than 3 million population .

structure and the change in HMO penetration and find little correlation. Some have suggested that it wasn't the realization of the rise of managed care, but the anticipation (which in some cases may have been in error) that led hospitals to consolidate. Work in progress by Town and Park (2011) provides support for this hypothesis. They find that HMO exit, a measure of the exuberance of expectations regarding the demand for managed care in a location, is correlated with hospital consolidation.

There have also been substantial changes in market structure in U.S. physician markets. Liebhaber and Grossman (2007) report that the percent of physicians in solo or 2 person practices declined from 40.7 percent in 1996-97 to 32.5 percent in 2004-05. Further, the proportion in practices of 3-5 physicians fell over the same period. The proportion of physicians practicing in groups of 6 or more grew from 15.9 percent to 21.8 percent. The number of physicians in other practice settings (primarily employed by others) grew from 31.2 to 36.0 percent over this period. Since the number of physicians per 1,000 persons has not really changed ( $\sim 2.5$ ) since 1997 (National Center for Health Statistics, 2011), this represents an increase in concentration.

There is no good systematic information on the structure of local physician markets. Those markets, especially for specialized services, may be very concentrated, but there is no information generally available at the national level. Schneider et al. (2008) constructed HHIs for physician organizations in California at the county level for 2001. They find the average county HHI for physician organizations was 4,430, implying a high degree of concentration on average. They found that 17 percent of California counties had a physician organization HHI below 1,800, 33 percent had an HHI between 1,800 and 3,600, and 50 percent had an HHI above 3,600.

Tables 2, 3, and 4 provide information about health insurance market structures for the U.S. This information shows consistently high levels of concentration in health insurance markets.

Table 2 contains measures of HHI for HMO plus PPO markets in the U.S. from reports from the American Medical Association (AMA). They show high levels of concentration (although lower than for hospitals). The numbers show insurance market concentration declining somewhat over time (although not consistently). However, there are some concerns about the accuracy of these numbers (see Capps, 2009; Dafny et al., 2011a).

Dafny (2010) and Dafny et al. (2011b), using data on the large employer segment of the insurance market, also show increasing concentration in health insurance markets. Dafny (2010, Figure 5) documents an increase in the percentage of markets with 1-4, 5-6, or 7-9 insurance carriers in the U.S. from 1998-2005, and a decrease in the percentage of markets with 9-10 or more than 10 carriers. Dafny et al. (2011b) state that the mean HHI in their sample increased from 2,286 to 2,984 from 1998-2006, the median 4 firm concentration ratio increased from 79 to 90 percent, and the mean number of carriers per market fell from 18.9 to 9.6. They show (Figure 1 in their paper) that 78 percent of the markets they study had increases in the HHI of 100 points or more from 2002

to 2006, and 53 percent experienced increases of 500 points or more. Table 3 has mean HHIs by year from the data used in those papers. These numbers indicate that the large employer segment of the health insurance market is concentrated and has grown more so over time. These numbers are roughly similar in magnitude to those calculated by the AMA. However they show concentration increasing over time (by about 400 points from 2004-2008), while the AMA numbers exhibit a slight decrease over time.

A recent report by the U.S. Government Accountability Office (Government Accountability Office, 2009) compiled information on the market structure of the small group health insurance market in the U.S. Table 4 reproduces numbers from that report. As can be seen, those markets appear to be fairly heavily concentrated, and increasing in concentration. A recent paper by Schneider et al. (2008) utilizes a unique data source for California to construct HHIs for insurance plans at the county level for 2001. They find an average insurance HHI for California counties of 2,592. They report that 21 percent of counties have HHIs below 1,800<sup>2</sup>, 55 percent had HHIs between 1,800 and 3,600 and 24 percent had HHIs above 3,600. The information from these various data sources seem broadly consistent.

It is worth noting that, based on the data in Table 3 the increase in concentration in health insurance markets appears to occur much later than the increase in concentration in hospital markets. The major increase in hospital market concentration occurred in the mid to late 1990s. Insurance market concentration, at least for large employers, starts increasing in 2002.

In addition to “horizontal” consolidation between firms in the same industry (hospitals and hospitals, physician practices and physician practices), there has been some “vertical” consolidation between hospitals and physician practices. Figure 5 shows the trends in the proportions of hospitals with various kinds of integration with physicians. As can be seen, various forms of integration between physicians and hospitals grew and peaked during the 1990s, and have declined since then, with the exception of physician employment by hospitals, which has increased substantially over this time period.

In addition to information on market structure, there is some information on trends in prices and the contribution of health care prices to overall health care cost growth. Akosa Antwi et al. (2009) document a 100% increase in hospital prices in California from 1999-2006, although they do not find market concentration to be a contributor to the increase. Martin et al. (2011) decompose U.S. health spending growth into growth due to prices versus growth due to nonprice factors (e.g., population, intensity of care). They find that prices account for 60% of the increase in overall spending from 2008 to 2009. The proportion of health spending growth due to prices varies over time (see Exhibit 6 in Martin et al., 2011), but has been growing steadily since 2001.

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<sup>2</sup>The old Federal merger guidelines cutoff for considering a market highly concentrated (Federal Trade Commission and Department of Justice, 1992).

Some recent reports from state governments document growth or variation in health care prices. A report from the Massachusetts Attorney General’s office (Massachusetts Attorney General, 2010) finds that price increases caused most of the increases in health care spending in the state in recent years. The report also finds significant variation in prices and that the variation is uncorrelated with quality of care, but is correlated with market leverage. A report on Pennsylvania hospitals found substantial variation in prices for heart surgery, but no correlation of prices with quality (Pennsylvania Health Care Cost Containment Council, 2007).

Overall, the statistics presented here paint a picture of health care markets that are concentrated and becoming more so over time. There is also some evidence that prices are rising faster than quantities, and that price variation isn’t related to quality but may be due to market power.

### **3 Evidence on the Impacts of Consolidation**

Most of the evidence on the impacts of consolidation come from hospital markets. Unfortunately there are very few studies of competition in physician markets, mainly due to lack of data.

#### **3.1 Hospitals**

##### **3.1.1 Price**

There has been a lot of research on the impact of hospital market consolidation on prices paid by private payers. The overwhelming finding in the literature is that consolidation leads to higher prices (see Dranove and Satterthwaite, 2000; Gaynor and Vogt, 2000; Vogt and Town, 2006; Gaynor and Town, 2012, for reviews of the evidence).

Examining the distribution of realized hospital prices (for the privately insured) alone is informative about the functioning of hospital markets. Ginsburg (2010) uses administrative claims data for 8 geographic areas from 4 large private insurers to construct inpatient hospital prices. He finds that there is significant variation both within and across regions in hospital prices. For example, San Francisco has the highest average hospital prices in 2008, with prices equal to 210% of the Medicare reimbursement rate. The lowest rate is Miami-South Florida with mean prices that are 147% of Medicare rates – the mean price in San Francisco is 43% higher than Miami. Within San Francisco, the interquartile range is 116% of the Medicare price. Of course, there are a number of possible reasons for this variation. Cost, quality and demand differences will generally imply price differences. However, it seems unlikely that there is enough variation across those factors to generate such wide variation in price.

There are a number of different methods that have been used to estimate the impact of hospital consolidation on prices. The most direct approach compares price increases at merging hospitals with those at similar hospitals which did not merge (see Capps and Dranove, 2004; Dafny, 2009; Haas-Wilson and Garmon, 2011; Krishnan, 2001; Spang et al., 2001; Sacher and Vita, 2001; Tenn, 2011; Thompson, 2011). The vast majority of these studies find price increases of at least 10 percent due to merger, with some estimates of price increases due to merger of 40 percent or greater.

For example, Haas-Wilson and Garmon (2011) evaluate the Evanston Northwestern and Highland Park hospitals in the northern suburbs of Chicago. They find a price increase of 20 percent due to that merger. Tenn (2011) examines the merger of two hospitals in California: Summit and Alta Bates. He finds that prices at Summit hospital increased between 28 and 44 percent after the merger.

Another source of information on the impacts of hospital consolidation comes from studies which examine the impact of hospital market concentration (measured as the HHI) on price. These studies don't examine the effects of mergers directly, but allow one to calculate the expected impact of a merger based on its impact on market concentration. Vogt and Town (2006) calculate the average estimated impact of a merger of two equal sized hospitals in a five hospital market (a "5 to 4" merger).<sup>3</sup> They find that such a merger is estimated to increase prices by 5 percent.

Last, a few research papers have estimated the impacts of hospital mergers using simulation. These papers estimate models of hospital competition, then use the estimated parameters of those models to simulate the impacts of mergers (Town and Vistnes, 2001; Capps et al., 2003; Gaynor and Vogt, 2003; Brand et al., 2011). These papers find estimated impacts of mergers ranging from 5 to 53 percent increases in price. Town and Vistnes (2001) examine mergers among hospitals in Los Angeles and Orange Counties, California, where there are more than 120 hospitals between the two counties. They find that many of the mergers they examine would result in price increases of 5 percent or greater, in spite of the large number of hospitals in these counties. Capps et al. (2003) examine a 3 hospital merger in the southern suburbs of San Diego County, California, and find a price increase due to the merger of over 10 percent. Gaynor and Vogt (2003) find that a three-to-two hospital merger in San Luis Obispo, California (which was attempted, but blocked by the FTC) would have raised prices by over 50 percent. Brand et al. (2011) consider the recent proposed acquisition of Prince William hospital in Manassas, Virginia by Inova health system in Northern Virginia. They estimate that the acquisition would have led to price increases at Prince William hospital of anywhere from 19 to 33 percent.

Overall, these studies consistently show that hospital consolidation raises prices, and by nontrivial amounts. Consolidated hospitals that are able to charge higher prices due to enhanced market power are able to do so on an ongoing basis, making this a permanent

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<sup>3</sup>This results in an 800 point increase in the HHI, from 2000 to 2,800. As reported in 1, the average HHI rose by about this amount from 1997 to 2002, albeit from a higher base.

rather than a transitory problem.

### **3.1.2 Not-for-Profit Firm Behavior**

The hospital sector is characterized by the fact that there is a mixture of firms with different ownership types. Not-for-profits are the most common, but there are substantial numbers of for-profit hospitals and public hospitals. One question that is relevant in this setting is whether not-for-profit hospitals behave any differently with regard to their pricing behavior.

A number of studies (e.g., Keeler et al., 1999; Simpson and Shin, 1997; Dranove and Ludwick, 1999; Capps et al., 2003; Gaynor and Vogt, 2003) have addressed the issue of not-for-profit/for-profit differences in competitive conduct. Those studies do not find any significant differences in pricing behavior. In particular, the effects of consolidation on pricing do not appear to differ depending on whether a hospital is not-for-profit.

A recent study by Capps et al. (2010) examines whether not-for-profit hospitals are more likely than for-profit hospitals to offer more charity care or unprofitable services in response to an increase in market power. The implication is, that if there were such a difference, not-for-profits would be spending their profits from market power on socially beneficial activities. Capps et al. examine 7 years of data on California hospitals and find no evidence of any such differences – not-for-profits do not engage in any more socially beneficial activities than do for-profits when they possess market power.

### **3.1.3 Costs**

It is clear that mergers can result in efficiencies because of economies of scale, increased purchasing power, the ability to consolidate services, or the the transfer of managerial techniques and skill to the acquired hospital. However, mergers also have the potential to increase costs. Larger systems imply larger bureaucracies. In addition, hospital costs are not necessarily exogenous to market structure. Hospitals that are able to bargain for higher prices may have the incentive to use the resulting profits for the benefit of physicians and hospital executives (e.g., through capital expenditures that benefit physicians or increases in executive compensation or perks). This is particularly likely if there is no residual claimant (as is the case for not-for-profit organizations) or monitoring by the residual claimant is costly. Thus, the analysis of cost impacts is central to understanding the impact of hospital mergers. The evidence presented above suggests that, on average, hospital mergers result in increases in price. Consequently if there are significant cost reductions associated with mergers they are not passed onto the purchasers of hospital services in the form of lower prices.

A few studies do directly examine the impact of hospital mergers on costs. Dranove and Lindrooth (2003) examine mergers of previously independent hospitals that consoli-



date financial reporting and operate under a single license post-merger. They find that, on average, these hospitals experience post-merger cost decreases of 14 percent. System mergers in which the hospitals were not as fully integrated (as measured by the use of multiple licenses) did not realize cost savings. These findings suggest that integration of merging hospitals is necessary to achieve meaningful efficiencies. A recent study by Harrison (2010) finds that immediately following a merger costs declined, but eventually rose to pre-merger levels. This finding is difficult to reconcile with the view that mergers require significant upfront costs but have benefits accrue in later years. The circumstances in which mergers are most likely to result in meaningful cost decreases are those in which the merging facilities operate as a more fully integrated entity. To be clear, however, the presence of any cost savings does not mean that they are necessarily passed on to consumers.

### 3.1.4 Quality

A number of research studies have examined the impacts of hospital consolidation on various measures of quality, although the most commonly used measure of quality is mortality (adjusted for patient severity of illness). The results in this literature are mixed, although the results are strongest for markets with regulated prices (see Gaynor, 2006; Vogt and Town, 2006; Gaynor and Town, 2012, for surveys).

A number of studies have examined the impact of market concentration on patient mortality for Medicare patients. There are a variety of findings, but the strongest studies find that market concentration significantly increases mortality (Kessler and McClellan, 2000; Kessler and Geppert, 2005).

Kessler and McClellan find that risk-adjusted one year mortality for Medicare heart attack (acute myocardial infarction, or AMI) patients is significantly higher in more concentrated markets. In particular, patients in the most concentrated markets had mortality probabilities 1.46 points higher than those in the least concentrated markets (this constitutes a 4.4% difference) as of 1991. This is an extremely large difference – it amounts to over 2,000 fewer (statistical) deaths in the least concentrated vs. most concentrated markets.

The English National Health Service (NHS) adopted a set of reforms in 2006 that were intended to increase patient choice and hospital competition, and introduced regulated prices for hospitals based on patient diagnoses (analogous to the Medicare Prospective Payment System). Two recent studies examine the impacts of this reform (Cooper et al., 2010; Gaynor et al., 2010) and find that, following the reform, risk-adjusted mortality from heart attacks fell more at hospitals in less concentrated markets than at hospitals in more concentrated markets. Gaynor et al. (2010) also look at mortality from all causes and find that patients fared worse at hospitals in more consolidated markets.

The results of studies which examine impacts of competition for privately insured

patients are more mixed. A number of studies find that quality is positively affected by competition, a number find that it is negatively affected by competition, and some find no effect. As a consequence, there is no clear impact of the impact of hospital consolidation on quality for privately insured patients that can be ascertained from the current research literature.

A recent study by Cutler et al. (2010) examines not only the impacts of competition on quality, but also impacts on costs. Cutler et al. use the repeal of entry restricting regulation (hospital certificate of need regulation; CON) in Pennsylvania to examine the effect of entry of hospitals into the CABG surgery market. They find that entry led to increased quality, but that the gains from reduced mortality due to entry are approximately offset by the additional costs incurred by entering firms.

A recent paper by Romano and Balan (2011) attempts to directly assess the impacts of hospital mergers on quality. Romano and Balan study the impact on quality of care of a consummated merger between two hospitals in the Chicago suburbs (Evanston Northwestern Hospital and Highland Park Hospital). This merger was the subject of an antitrust suit by the Federal Trade Commission, and the authors provided evidence on the case. They find no significant impact of the merger on many quality measures, but there is a significant negative impact on some and a few with positive impacts. They estimate that the merger led to heart attack, pneumonia, and stroke mortality going up at Evanston Northwestern Hospital, although not at Highland Park. There was some improvement in quality for some nursing-sensitive quality measures: the incidence of decubitus ulcers (bedsores) fell at both merged entities, as did infections at Evanston Northwestern. Conversely, the incidence of hip fractures rose at Evanston Northwestern. Last, they found increases in some measures of obstetric outcomes (birth trauma to the newborn, obstetric trauma to the mother), and decreases in some other measures. They conclude that overall there is no reason to infer that the merger had salutary effects on quality.

Overall, the research evidence suggests that hospital consolidation can have a negative impact on quality in markets with regulated prices, like Medicare. However, the current research evidence where prices are market determined (the privately insured) does not indicate a clear impact of consolidation on quality in those markets in general.

### **3.2 Physicians**

As stated previously, there is relatively little research on competition in physician services markets, mainly due to lack of available data. There are some studies, however, which shed some light on this topic.

Economics suggests that there is a minimum population necessary for a given area to support a physician of a particular specialty. Further, the smaller the total number of physicians in a given specialty, the larger the population necessary to support a physician.

If the total number of physicians expands, then competition will lead to lower incomes for physicians in larger communities, and physicians will diffuse out to smaller areas, so the minimum population necessary to support a physician will fall. Rosenthal et al. (2005) test this hypothesis by examining communities in states in which the total number of physicians doubled from 1970 to 1999. They find that communities of all sizes gained physicians over this period, but that the impact was larger for smaller communities, implying that competition among physicians did increase due to the increased number of doctors.

Some recent work by Schneider et al. (2008) examines the impact of physician and insurer market concentration on physician prices. They find that physician market concentration is associated with significantly higher prices. A 1% increase in the physician HHI leads to 1-4% higher physician prices. Conversely, they find that the health insurer HHI has no statistically significant impact on physician prices.

### 3.3 Insurers

Until recently there has been very little research on competition by health insurance firms. Part of the reason for this has been the paucity of sufficient data for given markets to construct measures of prices or market shares in the U.S. and internationally. For the U.S., there are detailed household level data (the Medical Expenditure Panel Survey, <http://www.meps.ahrq.gov/mepsweb/>) on health insurance decisions and prices, but these data are from surveys of approximately 4,000 households selected to be nationally representative. As a consequence, they don't fully describe the choices in a given market, or catalog the prices of alternatives, let alone the market shares of sellers. Other data (National Association of Insurance Commissioners, <http://www.naic.org>) do capture market shares, but at the level of a state. Since the vast majority of health insurance restricts enrollees' choices to a network of providers, most of whom are local, the geographic market for health insurance is often local, and smaller than a state. In addition, there are no comprehensive data on health plans' networks of providers. The most comprehensive data on health insurance markets has been for private insurance associated with the Medicare program (Medigap coverage, Medicare+Choice/Medicare Advantage).

Dafny (2010) is one of the first of some new studies on insurance market competition. Dafny uses data from a benefits consulting firm on the plans purchased and premiums paid by a large number (776) of large employers over the period 1998-2005. While these data are not necessarily complete by market or nationally representative, they do represent the most extensive and comprehensive data set with prices and quantities for the insurance market.

She examines the effect of shocks to employer profitability on the changes in the insurance premiums they pay. The idea is that if insurers possess no market power then the premiums they charge will not vary with employer profitability. Only if insurers

have market power will they be able to price discriminate based on employer profitability. Dafny finds evidence that premiums increase with the buyer's profitability. She also finds that the effect of employer profitability on insurance premiums falls with the number of firms in the market. More precisely, what Dafny finds is that the effect of increased profitability for an employer is to increase premiums in markets with few insurers by more than in markets with a large number of insurers, for the same employer.

It is notable that there are significant effects of employer profitability in insurance premiums even for markets with 9-10 insurers (the effect is insignificant for markets with 10 or more insurers). It seems surprising that insurers would possess market power in markets with 8-9 rivals (9-10 firms total). This empirical result does raise some doubts, but research by Dranove et al. (2003) found patterns in 1997 suggesting there may be market power in HMO markets with up to 6 firms. In any event, Dafny is a contribution that opens a line of empirical research on competition in health insurance markets.

Dafny et al. (2011b) employ the same dataset as in Dafny (2010), but examine how the growth rate of an employer's health insurance premiums is affected by health insurance market concentration (HHI). Initial estimates reveal no significant effect of insurer market concentration on premium growth. Of course, market concentration may be codetermined with premium growth, making it difficult to tease out a clear effect. In order to deal with that problem Dafny et al. examine changes in local market concentration due to a large merger in 1999 between two national health insurers: Aetna and Prudential Healthcare. Using this, they find a significant impact of the predicted change in HHI due to the merger on the change in premiums. They find that the cumulative effect of insurer market consolidation on premiums is approximately 7%.

Dafny et al. also recognize that insurers may have bargaining power (market power in a posted price world) with regard to providers. They therefore examine the effect of insurer concentration on changes in earnings and employment for physicians and for nurses as a way of testing for the presence of insurer monopsony power. They find that the merger reduced physician earnings growth on average by 3%, while nurses' earnings rose by approximately 6-10ths of 1%. There is no significant effect on physician employment, while nurse employment grows as a result of the merger induced increase in concentration. This doesn't seem to be evidence of monopsony power, but it is consistent with plan concentration leading to downward pressure on physician earnings and ultimately to substitution of nurses for physicians.<sup>4</sup> Overall, while the estimation results depend crucially on the use of the Aetna-Prudential merger as a driver of changes in local insurance market concentration, they show evidence of a significant relationship between changes in insurer market concentration and changes in premiums, implying a link between market structure and the exercise of market power.

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<sup>4</sup>Sorensen (2003) and Wu (2009) find that health plans who are better able to channel patients can extract greater discounts from hospitals. Shen et al. (2010) and Moriya et al. (2010) find health insurer concentration reduces hospital prices, while Schneider et al. (2008) find no effect of insurer concentration on physician prices.

Maestas et al. (2009) document substantial price variation in Medigap insurance markets, even though plans are standardized. They find that insurers have substantial differences in costs, and hence loading fees, which contribute to the observed variation in prices. This conclude that price dispersion is caused by substantial search costs – Maestas et al. estimate an average search cost for consumers in the market of \$72 and a maximum of \$144.

Starc (2010) also examines the Medigap market for insurance, using a model that allows for both adverse selection and market power. She documents that the market is highly concentrated – the national 4 firm concentration ratio is 83% (compared to 44% for private passenger automobile insurance or 34% for life insurance), and two firms (UnitedHealth, 46% and Mutual of Omaha, 24%) account for almost all of that. Starc documents substantial price dispersion for Medigap policies, confirming Maestas et al., and documents a positive relationship between premiums and market concentration, the same qualitative result as in Dafny et al. (2011b), albeit for a very different market. A 1% increase in the 2 firm concentration ratio is associated with a 0.26% increase in premiums.

Starc then uses the estimates from her model to find the impacts of adverse selection and market power in the Medigap market. She finds that adverse selection increases premiums by 9% and reduces the size of the market (lowers insurance coverage) by 18%. Starc goes on to calculate the impact of market power by calculating what premiums would be if they were set equal to costs. This is estimated to lead to large reductions in prices – 44 and 45%, respectively. These results emphasize the substantial market power exercised in this market.

Lustig (2010) examines the market for Medicare+Choice plans in 2000-2003. Medicare+Choice are private managed care plans that Medicare beneficiaries may choose as an alternative to traditional Medicare (the current version of this program is called Medicare Advantage). Lustig allows for both adverse selection and market power in his model. He finds that consumers' health risk has no significant impact on insurers' costs. Lustig then goes on to use the model estimates to simulate the gains to consumers and producers when adverse selection is eliminated and compare that to what he actually observes. The gain from eliminating adverse selection is simulated for markets with increasing numbers of insurers to generate effects of competition. Lustig finds that the gains to eliminating adverse selection increase steadily in the number of insurance firms. For example, in one of his simulations Lustig finds that removing adverse selection eliminates 17% of the difference in consumer and producer benefits between the observed and socially optimal outcomes where there's a monopoly, while it eliminates 35% of the difference in a duopoly, and 50% where there are 6 or more firms. This implies that when there is market power most of the welfare loss is due to the exercise of market power as opposed to adverse selection.

A paper by Town and Liu (2003) estimates a model of the Medicare+Choice market,

the predecessor of Medicare Advantage, i.e., the market for private Medicare plans. They use their estimates to calculate the impacts of the program and of competition. They find that the creation of the M+C program resulted in approximately \$15.6 billion in consumer surplus and \$52 billion in profits from 1993 to 2000 (in 2000 dollars), i.e., \$67.6 billion in value to consumers and producers. They also find evidence of competitive effects. Consumer benefit increases with the number of plans in a county, and most of the increase is due to increased premium competition. Comparing monopoly markets versus markets with 4 firms, they find that 81% of the difference in consumer benefit (higher in quadropoly markets) is due to increased premium competition. Of the remainder, 3% is from increased product variety and 8% from prescription drug coverage.

### **3.4 Vertical Integration**

Vertical integration between hospitals and physicians or insurers and providers can in principle provide efficiencies by aligning incentives, allowing for better coordination of care and joint investments which enhance efficiency or the quality of care. At the same time, integration can potentially harm competition by foreclosing rivals from access to key inputs. An integrated system which has locked up all the orthopedists in town, for example, may make it difficult to impossible for another hospital to offer orthopedic services or for a freestanding ambulatory surgery center to enter the market and compete on orthopedic services. Separately, integration may eliminate competition among previously independent providers. For example, physicians who had previously been in competition all become members of the same firm once they integrate with a hospital system (or an insurer).

There is very little evidence at present on the impact of vertical integration on market power. In part, that is because vertical integration has not been that common in health care. It was quite rare until the mid-1990s, and then declined rapidly thereafter. Integration between hospitals and physician practices peaked in 1996 at approximately 40% of all hospitals, and declined thereafter (Burns and Pauly, 2002; Ciliberto, 2005). This pattern was repeated with vertical integration of hospitals into the insurance market, although the extent of vertical integration was never as great as between hospitals and physicians (Burns and Pauly, 2002). This growth coincided with the growth of managed care, and in particular with the perceived growth in managed care organizations' negotiating power with hospitals. Burns et al. (2000) find that hospital-physician alliances increase with the number of HMOs in the market. They infer that providers may be integrating in order to achieve or enhance market power. More recently, Berenson et al. (2010) conducted 300 interviews with health care market participants, and report that increased bargaining power through joint negotiations listed as one of several reasons for hospital-physician alliances.

Certain types of vertical relations in health care have been the subject of significant antitrust scrutiny — exclusive dealing between physician practices and hospitals (usually

for a specialized service, e.g., radiology, anesthesiology, or pathology), and most-favored-nations clauses between insurers and providers, which require the provider to give the insurer a rate as low as it gives to any buyer (see Gaynor and Haas-Wilson, 1998; Haas-Wilson, 2003, for reviews of vertical issues in health care).<sup>5</sup>

In spite of the interest in this topic, there is relatively little evidence on the effects of vertical restraints in health care. Ciliberto and Dranove (2005) and Cuellar and Gertler (2005) are the only two papers (of which I am aware) which examine the competitive impacts of vertical integration in health care. Both papers look at the effects of hospital-physician practice integration on hospital prices. The two studies find opposite results – Cuellar and Gertler find evidence consistent with anticompetitive effects of physician-hospital integration, while Ciliberto and Dranove find no such evidence.

Research on efficiencies from integration does not find much evidence of positive gains from integration. Burns and Muller (2008) review the empirical evidence on hospital-physician relationships. They find little evidence of an impact of integration on costs, quality, access or clinical integration. Madison (2004) investigates the relationship between hospital-physician affiliations and patient treatments, expenditures, and outcomes using data on Medicare heart attack patients. She finds little evidence of any impacts of hospital-physician relationships.

## 4 Who Pays for Higher Provider Prices?

As mentioned previously, when consolidation leads to providers obtaining higher prices from providers the impact ultimately falls on consumers, not insurers or employers. Research evidence consistently shows that higher health insurance costs for employers are passed on to employees in the form of lower wages (or lower wage increases) (see, e.g., Gruber, 1994; Bhattacharya and Bundorf, 2005; Baicker and Chandra, 2006; Emanuel and Fuchs, 2008). In addition, there is recent evidence that hospital mergers have increased the number of the uninsured. Town et al. (2006) find that private insurance rolls declined by approximately 0.3 percentage points or approximately 695,000 lives in 2003 due to the effects of hospital mergers, with the vast majority of those who lost private insurance joining the ranks of the uninsured.

As a consequence, even though privately insured consumers typically pay a very small share of provider fees directly, they bear the brunt of the impact of higher fees by

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<sup>5</sup>Complaints about exclusive contracts between hospitals and physician practices are the most numerous type of antitrust case brought in health care. One of these cases was decided by the Supreme Court (*Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2(1984)), and represents an important legal precedent on exclusive dealing and tying. There have also been a number of cases on most-favored-nations clauses, e.g., *Ocean State Physicians Health Plan v. Blue Cross & Blue Shield*, 883 F.2d 1101 (1st Cir. 1989), *cert. denied*, 494 U.S. 1027 (1990) and *Blue Cross & Blue Shield v. Marshfield Clinic*, 65 F.3d 1406 (7th Cir. 1995), *cert. denied*, 116 S. Ct. 1288 (1996).

ultimately receiving reduced total compensation from their employers.

## 5 Policy

There are a number of policy levers that can be considered to deal with consolidation in the health care industry. They include antitrust enforcement, enhancing supply by facilitating the entry of new providers (including new forms of providers), policies designed to enhance the responsiveness of demand, and rate regulation. These policies need not be pursued in isolation. For example, vigorous antitrust enforcement is likely to be most effective paired with policies that facilitate entry. Even under rate regulation providers compete for patients via quality or other means. Taking steps to maintain or enhance that competitive environment can substantially improve performance even if prices are regulated. Policies that enhance the entry of new providers can ultimately reduce the need for intensive antitrust enforcement or rate regulation.

### 5.1 Antitrust

The standard approach to the injurious effects of market consolidation is vigorous antitrust enforcement. Antitrust enforcement must be applied judiciously. Consolidation or integration can be efficiency enhancing, and those cases should be allowed and encouraged. However, the evidence does not support efficiency enhancing consolidation in general, at least in hospital markets. While there is some evidence that prices are higher in more concentrated physician and insurance markets, we do not have direct research evidence on the impacts of consolidation on efficiencies or quality in those markets.<sup>6</sup>

Antitrust enforcers should carefully examine proposed mergers and block those they find anticompetitive. This policy can be successfully pursued, but it should be recognized that many markets (especially for hospitals) are already highly concentrated. Another policy is to prosecute cases against consummated mergers, where the merged entities have exercised market power and not realized any substantial efficiencies. In addition, enforcers can pursue anticompetitive behavior intended to harm competition (for example, attempting to prevent entry or force exit of competitors). The enforcement agencies' resources are limited, so there are only so many cases of this sort they can pursue. It is possible, however, that vigorous enforcement against egregious offenders may have a chilling effect on the exercise of market power by others, who fear the possibility of detection and prosecution.

Another aspect of antitrust enforcement is providing safe harbors for integration that is considered to be efficiency enhancing. While efficient forms of organization should be

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<sup>6</sup>Nonetheless, if prices are higher in more concentrated markets, that is evidence that any efficiencies that consolidated firms may realize are not being passed on to consumers in the form of lower prices.



allowed to emerge and flourish, care must also be taken to avoid allowing integration that is only a sham with regard to efficiency and is truly for the purpose of enhancing market power. This is true in general, but is currently salient with regard to the Accountable Care Organizations (ACOs) which are part of the health reform law. As indicated previously, integration among hospitals and doctors has the potential to be efficiency enhancing, but can also cause harm to competition, and can potentially make it more difficult for innovative organizations to enter markets. This is a factor which must be given serious consideration.

Last, it is sometimes proposed that allowing firms on one side of a market to acquire market power is an appropriate response if firms on the other side of the market already possess it (e.g., allowing providers to acquire market power if insurers have substantial market power). This is sometimes called countervailing power. The notion is that having a sort of balance of market power on both sides of the market is better than only having market power on one side. This is not necessarily the case. First, it must be true that one side of the market does indeed have market power and it is causing harm. Hard bargaining over price (or other matters) is not in and of itself of harmful market power. Second, the best response is to deal directly with the problem, and try to eliminate or reduce the extant market power. Antitrust enforcement is the most likely tool for this. This is certainly better than creating a situation with more market power. Third, if it is not possible for some reason to deal directly with the extant market power on one side of the market, having market power on both sides does not necessarily improve matters. It can do so, but it can also make things worse. If the only way firms have to increase their bargaining power is by restricting the quantity they sell, then countervailing power will make things worse than market power on only one side of the market.

## 5.2 Supply Side Policies

Another policy lever are policies that facilitate the entry of new providers, and in particular allow for innovation. It may be that markets (again, hospital markets in particular) have become so concentrated that the effectiveness of antitrust enforcement is limited. That may leave inefficiencies in place in the short run. However, in the long run, as the technology of medicine changes, new types of providers will likely emerge and compete with current organizational forms. We have already seen some of this via the entry of free standing ambulatory surgery centers, retail clinics, and specialty hospitals. In the case of insurance, a key factor governing entry is the ability to field an attractive network of providers. Making sure that providers, particularly those that are perceived as “must-have” providers, are available to potential entrants is a critical factor. Regulation can play a role as well. Relatively few states have retained certificate of need regulation for health care facilities, but such regulation can raise the costs of entry. Insurers have to deal with differing sets of regulations in every state, and are not allowed to pool risk across states. Such factors may also raise the costs of entry.

Facilitating the entry of new firms, and in particular innovative new forms, can ameliorate or eliminate the effects of current consolidation in the long run. As stated previously, however, care still must be taken to ensure that such entry is possible, and not foreclosed by integration, so antitrust enforcement also plays a key role here. Obviously, such a process will take time, although change can sometimes occur very rapidly.

### 5.3 Demand Side Policies

Competition can only occur if demand by payers or consumers is sufficiently responsive to price or quality differences across providers, and if there's sufficient choice of providers. Selective contracting by private payers is a mechanism which helps to create an environment where competition among providers is possible. If payers contract with every provider in a market, then they have very little bargaining power. Policies that enhance the ability of payers to selectively contract with providers are important, but they will only be effective if there is sufficient choice among providers.

Transparency, providing information about prices or quality to the public, is a policy that has received substantial attention, and has been implemented by some states. In principle, it seems as more information should be better. However, this is not necessarily the case. Making pricing information public can make it easier for firms to collude. In addition, it's not clear that heavily insured consumers have sufficient incentive to pay attention to price differences. Even consumers who have policies with a lot of cost sharing will not face much of the impacts of price differences if they obtain an expensive treatment. Expensive treatments put most consumers well beyond their deductibles and copays so that they bear little to none of any price differences across providers.<sup>7</sup> Of course, expensive treatments account for the majority of medical spending.

Providing clear and understandable information about products (providers' and insurers') so consumers can understand what they are obtaining can facilitate competition (again, conditional on sufficient alternatives). If consumers have little information or don't understand the information they have, they tend to rely on reputations, brand names, etc. This tends to decrease the responsiveness of demand to prices or other factors and enhances firms' market power.

### 5.4 Rate Regulation

A possible response to highly concentrated markets is rate regulation. If markets are highly concentrated and there appears little hope of competition, then price regulation is an economic policy that can be employed. However, moving to a regulated price

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<sup>7</sup>This doesn't mean that being insured against large losses is bad – it isn't. Consumers should be insured against large risks. It just means that it's not realistic to expect them to pay attention to prices in such a situation.

environment for the privately insured would be a nontrivial undertaking, with all of the issues associated with regulation and bureaucracy. Evidence from state hospital rate regulation programs in the 1970s and 1980s indicates a mixed pattern of success. The setup and administration of the program played a large role in whether they were effective. Nonetheless, there is evidence that finds that mandatory rate regulation program in a number of states did reduce the rate of growth of hospital expenses (by a little more than 1%) (Dranove and Cone, 1985; Sloan, 1983).

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Table 1: Hospital Market Concentration,  
U.S., 1987-2006<sup>a</sup>

Year	Mean HHI <sup>b</sup>	Change <sup>c</sup>
1987	2,340	—
1992	2,440	100
1997	2,983	543
2002	3,236	253
2006	3,261	25

<sup>a</sup> Source: American Hospital Association.  
Data are for U.S. Metropolitan Statistical Areas with population < 3 million.

<sup>b</sup> Herfindahl-Hirschmann Index. Means weighted by MSA population.

<sup>c</sup> Total change from the previous year in the table.

Figure 1: Hospital Mergers and Acquisitions, 1998-2010. Source: Irving Levin Associates, Inc., The Health Care Acquisition Report, Sixteenth Edition, 2010.

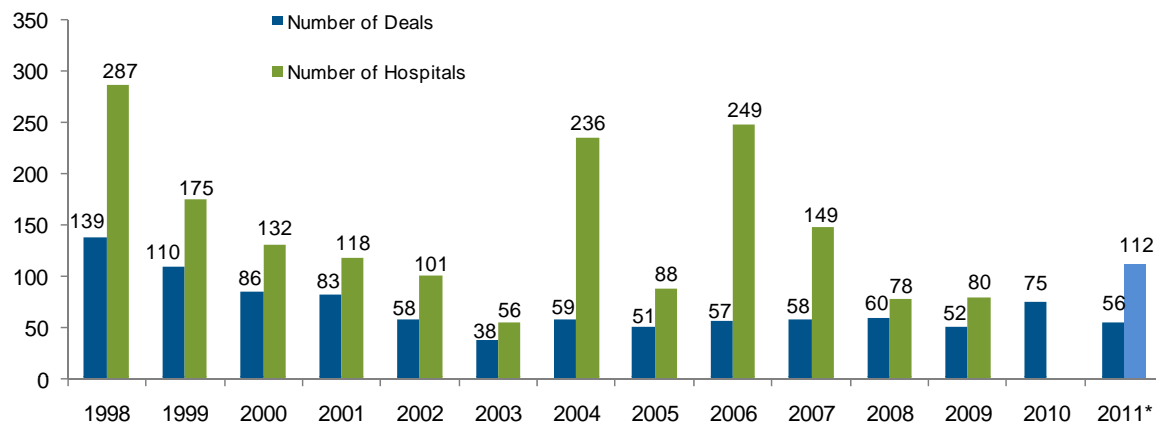


Figure 2: Number of Hospitals in Health Systems, 2000-2009. Source: American Hospital Association.

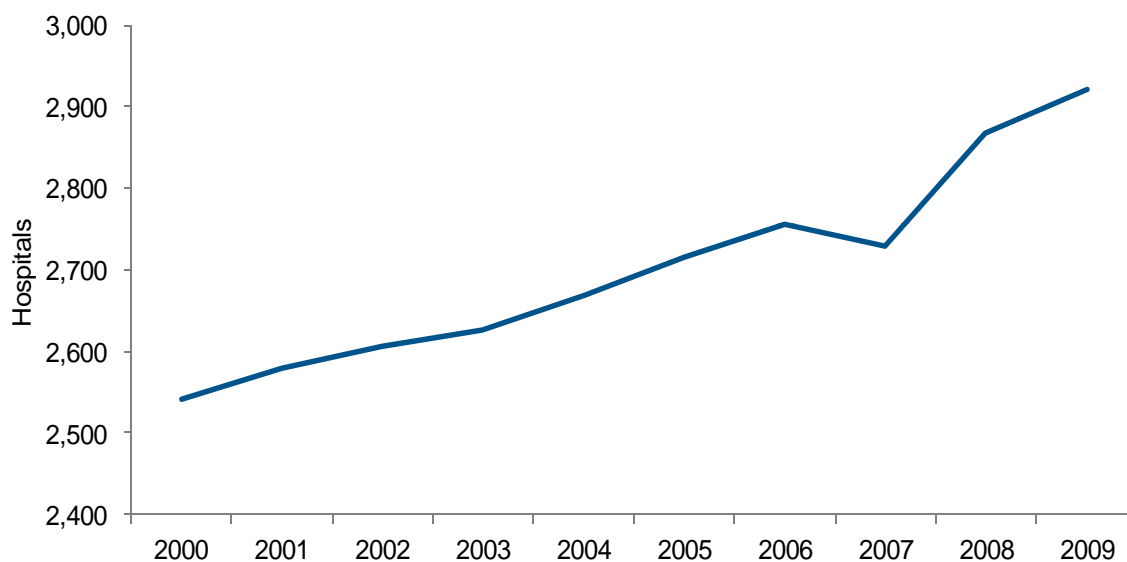


Figure 3: Scatterplot of MSA HHI in 1990 and HHI in 2006

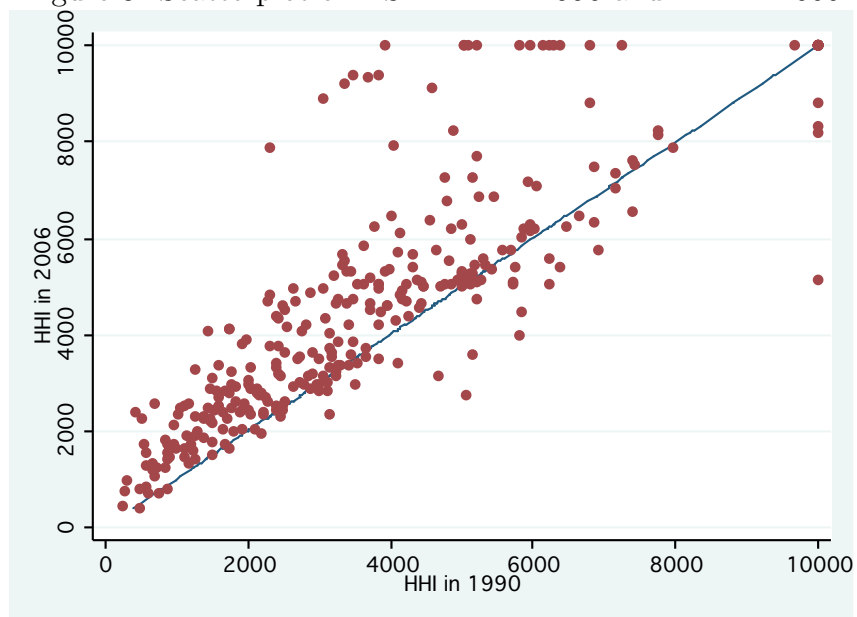


Figure 4: Trends in Hospital Concentration, M&A Activity and HMO Penetration: 1990-2006

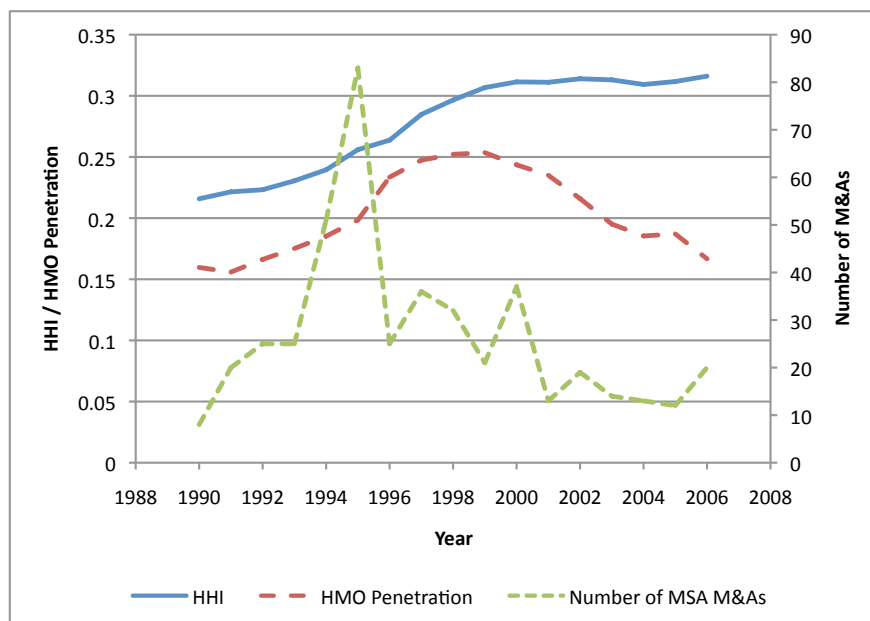


Table 2: Insurance Market Concentration, U.S., 2004-2008<sup>a, b</sup>

Year	Median HHI	Change	Mean HHI	Change
2004	3,544	—	3,939	—
2005	3,748	204	4,077	138
2006	2,986	-762	3,440	-637
2007	3,558	572	3,944	504
2008	3,276	-282	3,727	-217

<sup>a</sup> Source: See American Medical Association (2010) for more information on the data and calculations. American Medical Association (AMA) calculations for the combined HMO+PPO markets using January 1st enrollment data from HealthLeaders-InterStudy's (HLIS) Managed Market Surveyors © HealthLeaders-InterStudy.

<sup>b</sup> MSA-level HHIs for HMO+PPO markets.

Table 3: Large Employer Insurance Market Concentration, U.S., 1998-2009<sup>a</sup>

Year	Self + Fully Insured		Fully Insured Only	
	Mean HHI <sup>b</sup>	Change	Mean HHI <sup>b</sup>	Change
1998	2,172	—	2,984	—
1999	1,997	-175	2,835	
2000	2,175	178	3,092	
2001	2,093	-82	3,006	
2002	2,280	187	3,158	
2003	2,343	63	3,432	
2004	2,519	176	3,706	
2005	2,609	90	3,951	
2006	2,740	131	4,072	
2007	2,873	133	4,056	
2008	2,916	43	4,201	
2009	2,956	40	4,126	

<sup>a</sup> Source: These #s were graciously provided by Leemore Dafny. The data are for large multisite employers and do not represent the totality of the insurance market. For more information on the data source, see Dafny (2010).

<sup>b</sup> Weighted by # of enrollees.

Table 4: Small Group Insurance Market Structure, U.S., 2000-2003<sup>a</sup>

Year	Median Market Share, Largest Carrier	# of States with 5 firm concentration ratio $\geq 75\%$
2002	33%	19 (of 34; 56%)
2005	43%	26 (of 34; 77%)
2008	47%	34 (of 39; 87%)

<sup>a</sup> Source: Government Accountability Office (2009).

Figure 5: Physician-Hospital Trends, 1994-2007. Source: American Hospital Association.

