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Do Leading Health Insurers' Market Shares Churn? Some Observational Evidence from U.S. Metropolitan Markets

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Abstract

Data from the American Medical Association (AMA) have consistently pointed to MSAs in the United States with highly concentrated health insurance markets as defined by Herfindahl-Hirschman indices (HHI). This study uses data from the AMA to peel back the layers of the HHI onion and finds evidence of competitive health insurance markets. For example, descriptive statistics show that 30 percent of the largest health insurers lose their top spot after six years. In addition, only 12 percent of the second-largest health insurers remain in the second spot 6 years later with the second-largest health insurer rarely replacing the first. Finally, multiple regression analysis reveals that a Blue Cross Blue Shield affiliation, rather than the leading insurers' market share or not-for-profit status, enhances the probability of remaining in the top spot six years later. Moreover, the regression findings suggest that a greater market share in the initial period is associated with a higher market share for the top insurer six years later but the effect is relatively small. Consequently, insurance regulators may wish to consider both the HHI and the actual churning of market shares among leading firms when considering the competitive nature of specific health insurance markets.

Key words: competition in health insurance markets, dominant health insurer, market share churning of health insurers

I. Introduction

Like in the Netherlands and Switzerland, private companies are primarily responsible for providing health insurance in the United States. In fact, about 64 percent of the U.S. population currently receives health insurance coverage through private carriers (DeNavas-Walt, Proctor, and Smith, 2013). The Congressional Budget Office (2014) expects that 25 million more individuals will sign up for private coverage by 2018 because of the Affordable Care Act of 2010. A reasonable amount of competition will be crucial for the proper functioning of the private health insurance market. In particular, economic theory suggests that firms are incentivized to offer the products that consumer desire at the lowest possible prices when sufficient competition exists.

Contemporary evidence, however, suggests that competition among health insurers may be sorely lacking in various regions of the United States. For example, the American Medical Association (2012) reports that the Herfindahl Hirschman Index (HHI), for over 95 percent of all metropolitan statistical areas (MSAs), exceeds the "highly concentrated" cutoff of 2,500 at which the Department of Justice and Federal Trade Commission typically challenge a horizontal merger.[1] In addition to these disturbingly high health-insurer HHIs, several recent studies document that more highly concentrated markets cause, or are related to, undesirable measures of health-insurer performance.

More specifically, Dafny (2010) explores competitive behavior in local geographic markets using a privately-gathered national database of insurance contracts agreed upon by a sample of large, multi-site employers. She finds evidence of direct price discrimination against more profitable firms, suggesting that health insurers exercise market power. In a follow-up study, Dafny, Duggan and Ramanarayanan (2012) use the same data set to examine the impact of health-insurer market concentration on employer-sponsored insurance premiums. They exploit the differential impact of the Aetna and Prudential Health Care in 1999 on health-insurer market concentration in different local markets to estimate the causal effect of concentration on market-level premiums. These authors find that the merger-induced change in market concentration brought about a 7 percentage point increase in premiums during the 1998 to 2007 period. Finally, Bates, Hilliard, and Santerre (2012), using a panel data set of U.S. states and Washington D.C. during the 2001 to 2007 period, show that rising health-insurer market concentration led to fewer people with individually purchased health insurance as monopoly theory predicts, particularly in states without a premium rate review system.[2]

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[1] The relevant geographical market for health insurance is typically defined narrowly as the metropolitan statistical areas (MSAs) because people generally prefer access to a local network of health care providers (see Kopit, 2004 or Pauly et al., 2002).The HHI is the sum of the squared market shares of all firms in the same market. The index ranges from near zero to 10,000 with larger HHIs pointing to increasingly higher market concentration. It increases with fewer and less-equally sized firms in the market.

[2] More recently, Dafny, Gruber, and Ody (2014) estimate that premiums on the individual health insurance exchanges would be lower with additional competitors.

Taken as a whole, the American Medical Association (AMA) series of annual reports and these three empirical studies suggest that health insurers do possess and exercise market power in many areas of the United States. One potential problem with the AMA reports and these three empirical studies, however, is that the amount of competition is measured by the HHI. A long time ago, Scherer (1980), and other industrial organization (IO) economists, pointed out that the HHI may actually mask the true amount of competition. For example, in year 1, suppose four firms, A (35%), B (30%), C (25%), and D (10%) operate in some geographical area with their market shares shown in parentheses, such that the HHI equals 2,850. Now suppose in year 2 that the market shares of the four firms become distributed in the following manner: D (35%), C (30%), B (25%), and A (10%). Note that the HHI remains unchanged but a significant amount of competition evidently took place between the two years as reflected in the churning of market shares among the four firms. It is simply the case, in this example, that one market leader's gain was another's loss. Churning of market shares can overcome the strong recognition of mutual dependence typically associated with stable market shares among leading firms and thereby reduce the likelihood of tacit or overt collusion (Sakakibara and Porter, 2001).

This paper uses data from the AMA for the years 2004 and 2010 to peel back the layers of the HHI onion to examine the amount of market share churning that takes place among the top two health insurers in the various MSAs of the United States. The empirical results show that a substantial amount of inter-firm rivalry takes place in the health insurance marketplace as reflected in much market share instability and the inability of a higher market share to protect the tenure of the dominant health insurer at the top spot.[3]

II. Data

The data for this study primarily come from the AMA (2005, 2012).[4] These two particular reports are chosen because they both include a large number of MSA observations over time (294 and 385 MSAs) yet the years of coverage (2004 and 2010) allow sufficient time for the market shares of health insurers to adjust in response to competitive forces. Firms often treat their market shares as an indicator of success. For example, in response to ConnectiCare's market share jumping ahead of UnitedHealth's in the Medicare Advantage market in Connecticut, the President of ConnectiCare was recently quoted in the *Hartford Courant* (2014) as saying: "We've been chasing them,…We've been growing and closing in on them each year, but we finally passed them this year".

To increase the MSAs for the base year so the number matches more closely with the 385 MSAs reported on by the AMA in 2010, 42 MSA-observations for 2005 from AMA (2006) and

[3]Studies examining the relationship between market concentration and performance in other lines of insurance business include Carrroll (1993), Bajtelsmit and Bouzouita (1998), Choi and Weiss (2005), and Pope and Ma (2008).

[4] Some studies, such as Dafny, Dranove, Limbrock, and Scott Morton (2011), have criticized the AMA data on various grounds. Our intent, however, is to treat the AMA data as being error free and to see if a different conclusion about the degree of competition in health insurance markets can be reached by analyzing market share instability rather than the HHI in various metropolitan markets.

23 MSA-observations for 2006 from AMA (2007) are included along with the observations for 2004 to arrive at a maximum of 359 useable MSA-observations for both the earlier years and 2010. The use of 2005 and 2006 data also means that the health-insurer's market shares have a minimum of four years to adjust in response to the competition that occur or fails to occur in the various MSA-markets. For convenience, we refer to the base year as 2004 in the discussion below.

The AMA *currently* reports the market shares of the top 2 insurers and the HHI for four different relevant product markets: the combined health maintenance (HMO)-Preferred Provider Organization (PPO)-Point of Service (POS) market, separate HMO market, separate PPO market, and separate POS market. But the 2005 report does not list the market for POS insurance or combine all three markets. Thus, to keep the relevant product market reasonably similar over time we focus solely on the PPO insurance market because it covers more individuals than the HMO insurance market.[5]

The AMA report only lists the market shares of the top two health insurers in each MSA so we are unable to investigate the churning of market shares among health insurers in the third spot or lower. We use the names of the top 2 health insurers, as reported by the AMA, to determine if those companies remained as the number 1 or 2 insurer in 2010 and any change in their market share over the period from 2004 to 2010. Many mergers and acquisitions (M&As) took place in the health insurance sector during that time. The problem for us is that the M&A may not have resulted in a name change for the acquired or acquired firms. Closer inspection of the top two companies in both 2004 and 2010, through a Web search, however, showed that any merger, if one indeed took place, did not involve the top 2 health insurers during the sample period based upon the names of the companies as identified by the AMA.[6] Nor did we find any evidence of the top 2 health insurers changing their names over the sample period.

We also wish to observe if a Blue Cross and Blue Shield (BCBS) plan or a nonprofit plan is among the top two insurers in the various market areas. To identify if a plan is either a BCBS plan or a nonprofit plan we relied upon BCBS and the Alliance for Advancing Nonprofit Health Care, respectively.[7] For some of the top two health insurers we had to consult their web pages to find out if they were organized on a commercial or nonprofit basis.

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[5] For example, 58 percent of all workers subscribed to PPO plans in 2010 whereas only 19 and 8 percent were members of HMO and POS plans (http://kff.org/report-section/ehbs-2014-summary-of-findings/).

[6] A couple of M&As did involve the number 1 and 2 health insurers but the merger took place after 2010. However, we cannot rule out that the AMA overlooked M&A involving the number 1 or 2 health insurer and a health insurer in the third spot or lower.

[7] The first source can be obtained at http://www.bcbs.com/about-the-companies/ and the second at http://www.nonprofithealthcare.com/resources/BasicFactsAndFigures-NonprofitHealthPlans9.9.08.pdf.

III. Empirical Findings

Table 1 provides some descriptive statistics regarding the typical market area for private PPO health insurance in the United States based upon the same 359 MSAs during both 2004 and 2010. Recall that the FTC/DOJ's rule of thumb is that a market is highly concentrated when the HHI exceeds 2,500. With that criteria in mind, consider that the average PPO-HHI exceeded 4,700 during both 2004 and 2010. In fact, the PPO-HHI was below 1,500, the reasonably competitive cutoff, in only one MSA during 2004. No MSAs fell within that range in 2010. Moreover, according to the data, the FTC and DOJ would consider only 17 MSAs in both 2004 and 2010 as being moderately concentrated (e.g., a HHI between 1,500 and 2,500). While the PPO-HHI declined slightly from 4,835 in 2004 to 4,742 in 2010, the difference is not statistically significant (t=0.68), and suggests that the level of competition remained the same over the 6-year period.

The data in Table 1 also show some interesting facts about the typical dominant PPO insurer (hereafter just insurer) operating in the 359 MSAs. According to the figures, the average dominant health insurer held a market share in excess of 60 percent in both 2004 and 2010. Also, a 60 percent or better chance exists that the dominant health insurer is organized on a nonprofit basis and there is an 80 to 90 percent chance that the dominant insurer is affiliated with BCBS. WellPoint and Empire Blue, the two for-profit BCBS plans, essentially account for the difference between the nonprofit and BCBS designations.

Table 1 also provides data on the percentage of dominant insurers remaining in the top spot after 6 years, the change in the dominant firm's market share over time, and the likelihood of the dominant insurer replacing the second-largest insurer once the top spot becomes contested. Notice that 30 percent of the dominant spots are lost within a 6-year period. For such a relatively short time period, a 30 percent displacement rate suggests a high degree of inter-firm rivalry that is actually masked by the relatively stable HHI. The descriptive statistics further show that the market share of the dominant firm falls by an average of 1.6 percentage points over the 6-year period. Among the dominant insurers remaining after six years, the drop in the market share amounts to 1 percentage point. The implication is that other insurers are only modestly able to chip away at the leading insurer's market share, on average. Interestingly, the once-dominant insurer rarely replaces the second-largest insurer upon losing the top spot. In fact, for only 24 percent of the cases does the once-dominant insurer replace the previously-second largest insurer upon losing the top spot. Apparently, the once mighty fall hard.

Some telling statistics regarding the second-largest insurer are also reported in Table 1. For instance, the second-largest insurer held a market share of roughly 18 to 20 percent, on average, over the 6-year period. That means the first and second largest insurers collectively controlled about 80 percent of the health insurance market over the 2004 to 2010 period. In 2010, about 30 percent of the second spots belonged to a nonprofit insurer with most of them also affiliated with BCBS. Both the percentage of nonprofits and BCBS plans in the second spot

significantly increased over the six-year period. Once again, the peeling of the HHI onion sheds some light on the true degree of health insurance competition over time. Specifically, the data imply that only 12 percent of all health insurers held on to their second spot six years later. In addition, the data suggest that the second-largest insurer rarely moves up to the top spot when the position is contested, meaning that an entirely different health insurer is able to leap frog ahead and grab the top spot.

Table 1: Descriptive statistics regarding the Health Insurance Marketplace for the same 359 U.S. Metropolitan Areas in 2004 and 2010

Characteristic	2004	2010
	Mean (standard deviation)	
Herfindahl-Hirschman Index (HHI)	4835 (1845)	4742 (1820)
Market Share of Largest Insurer (%)	63.0 (16.7)	61.4 (17.6)
Percent of Largest Insurers Belonging to BCBS (%)	83 (37.6)	90 (30.4)*
Percent of Largest Insurers Organized as Nonprofits (%)	64 (48.0)	61 (48.8)
Percent of Largest Insurers Remaining in 2010	-	70 (45.8)
Percent of Largest Insurers Replacing Second Largest Insurer When the Top Spot Churns	-	24.1 (43.0)
Change in the Dominant Market Share	-	-1.60 (19.0)
Market Share of Second Largest Insurer	18.2 (9.4)	19.8 (9.7)
Percent of Second Largest Insurers belonging to BCBS	13 (33.5)	25 (43.1)*
Percent of Second Largest Insurers Organized as Nonprofits	15 (36.2)	30 (46.1)*
Percent of Second Largest Insurers Remaining in 2010	-	12 (32.5)
Percent of Second Largest Insurers Replacing Largest Insurer When the Top Spot Churns	-	25.9 (44.)
Change in the Second-Largest Market Share	-	1.60 (11.6)

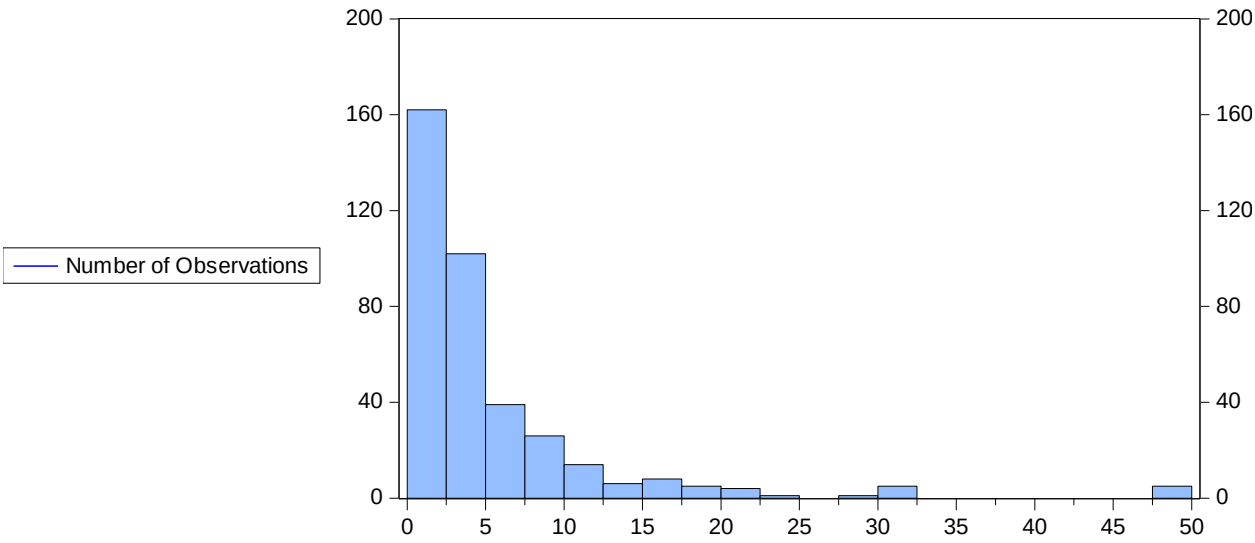
* Significantly different at the 5 percent level or better.

Figure 1 shows the market share of the various dominant insurers relative to the market share of the second-largest insurer in the various MSAs for 2004. Relative size ranges from a low of 1 (in Lewiston, Idaho and Salem, Oregon) to a high of 97 (in Blackstone, Virginia and Roanoke, Virginia).[8] On average, the dominant insurer is nearly 7 times larger than the second-largest insurer. Moreover, in 74 percent of the MSAs studied, the dominant insurer is at least twice the size of the second-largest insurer. The 2010 data yield a similar relative size distribution. Despite this huge discrepancy in size between the first and second largest firm, surprisingly 30 percent of the dominant insurers lose their top spot.

[8] Relative sizes greater than 50 are suppressed for viewing purposes.

We can use these cross-sectional data to answer some interesting questions regarding the tenure and market expansion of the top health insurer six years later.[9] First, does a higher market share in the initial period protect the dominant health insurer's tenure at the top spot and help it expand its dominance six years later? For instance, it may be the case a higher market share reflects a superior product which allows the insurer to expand over time. Alternatively, because of the greater market share, the dominant insurer may operate with a relative or absolute cost advantage, and/or engage in business practices such as persuasive advertising or limit pricing to raise its market share over time. Second, does a higher market share in the initial period make it easier for the second insurer to knock the dominant insurer off its lofty spot? In particular, IO economists often argue that inter-firm rivalry is more aggressive when market shares are more evenly distributed among the firms in an industry. The data allow us to examine if that is the case in this situation.

Figure 1: Market Share of Top Insurer Relative to the Market Share of the Second-Largest Insurer in the Various MSAs for 2004



Three, does a Blue Cross Blue Shield (BCBS) designation provide the dominant insurer with a competitive advantage because of brand name recognition? Given that health insurance is likely an experience good, the BCBS trademark may play a particularly important role when consumers or employers choose among the products offered by various health insurers. Finally, does nonprofit (NP) status offer a competitive advantage to the dominant firm? The tax-exemption may act as a subsidy (relative to for-profit insurers) or buyers may be attracted to nonprofit insurers because they face a non-distribution constraint and are therefore less likely to compromise the quality of their insurance coverage (Hansmann, 1996).

[9] We cannot examine the factors affecting the tenure and market expansion of the second-largest health insurer because very few remain six years later.

In the estimation equations, tenure is captured by a binary variable that takes on the value of 1 if the same company captured the dominant spot in both 2004 and 2010 and zero if not.[10] Both the tenure and market share of the remaining dominant insurers are explained by the same variables in 2004: the market share of the top PPO insurer in logs, market share of the second-largest PPO insurer in logs, two binary variables indicating if the dominant insurer is affiliated with BCBS or organized on a NP basis, and state-fixed effects. The state-fixed effects control for any tax or regulatory differences across states that might influence where insurers locate.[11]

As a robustness check, another specification is provided which includes those same explanatory factors but also adds the logarithm of income per capita in 2004, the growth of income per capita between 2004 and 2010, the logarithm of population in 2004 and the growth of population between 2004 and 2010 in each MSA. The level and growth of income and population may reflect some important factors affecting the market demand for health insurance. Data for these variables are obtained from the Bureau of Economic Analysis but are not available for all MSAs so 32 observations are lost for this specification.

The ordinary least square regression results in Table 2 provide some answers to our four questions regarding the tenure and market expansion of the dominant health insurer. The second and third columns show the findings for tenure status whereas columns 4 through 6 report results for the market expansion of the dominant insurers that remain after six years. The sixth column reports the findings when only dominant health insurers affiliated with BCBS are included in the estimation procedure.

First, the estimated coefficient on the top insurer's market share is not statistically different from zero in both equations predicting tenure status. That means a stronger foothold in the market does not necessarily guarantee that the dominant insurer will be able to maintain its number 1 spot six years later. With regard to market expansion, the estimated coefficient on the leading firm's market share is positive and statistically different from zero. Its estimated coefficient can be interpreted as meaning that a 10 percent higher initial market share raises the dominant insurer's market share by 3 percent six years later, assuming it remains at the top spot. However, that market share advantage translates into a relatively meaningless change. For example, suppose two health insurers with market shares of 60 and 66 percent in 2004, which reflects a 10-percentage difference. Suppose now that the share of the smaller dominant firm increases from 60 to 65 percent over the 6-year period (although the sample average is actually a reduction of 1 percentage point). If so, the market share of the larger dominant firm would increase by only an additional 0.15 percentage points.

[10] The tenure equation is not estimated by a probit or logit model because some state-fixed effects perfectly predict tenure status and, thus, the estimation procedure was unable to converge on a solution. Hence a linear probability model is estimated.

[11] Time-fixed effects are also specified for the 65 MSA observations using 2005 and 2006 data for the base year.

Table 2: Multiple Regression Results Predicting the Success of the Top Insurer

	Dependent Variable: Binary Variable Indicating if the Top Insurer Remained in 2010		**Dependent Variable**: Remaining Top Insurer's Market Share in 2010		
Explanatory Variables	Estimated Coefficient (absolute value of t-statistic)				
Constant	0.443 (0.59)	0.281 (0.21)	2.535* (6.29)	3.353* (3.85)	3.652* (4.35)
Log of Top Insurer Market Share in 2004	-0.032 (0.21)	0.011 (0.07)	0.338* (4.30)	0.290* (3.09)	0.306* (3.14)
Log of Second Largest Market Share in 2004	-0.029 (0.62)	-0.016 (0.32)	0.014 (0.61)	0.015 (0.57)	0.017 (0.63)
Binary Variable Indicating if the Top Insurer is a BCBS Plan	0.599* (10.1)	0.642* (8.55)	0.118 (1.10)	0.276 (1.73)	NA
Binary Variable Indicating if the Top Insurer is a Nonprofit Plan	-0.055 (0.68)	-0.002 (0.14)	0.141 (1.41)	0.283 (1.75)	0.324 (1.73)
Log of Per Capita Income in 2004		-0.017 (0.02)		-0.040 (0.52)	-0.052 (0.68)
Growth of Per Capita Income between 2004 and 2010		-0.167 (0.35)		-0.014 (0.52)	-0.062 (0.19)
Log of Population in 2004		0.009 (0.42)		-0.043* (2.77)	-0.044* (2.84)
Growth of Population between 2004 and 2010		0.020 (0.05)		0.070 (0.23)	0.127 (0.42)
Adjusted R^2	0.543	0.552	0.605	0.594	0.582
Number of Observations	359	327	253	226	221

1. Estimated coefficient statistically significant at the 5 percent level or better.
2. All specifications include state-fixed effects and time-fixed effects for 2005 and 2006 observations.
3. White heteroskedasticity-consistent t-statistics.

Second, according to the regression findings, the dominant health insurer does not face a lower probability of tenure or a reduced market share when the second-largest health insurer holds a larger market share in the initial period as the estimated coefficient on the second-largest insurer market share is not statistically different from zero. That result likely reflects that the dominant health insurer is often substantially much larger than the second largest health insurer as shown in Figure 1. Third, given its positive and statistically significant coefficient estimate in columns 2 and 3, BCBS affiliation appears to offer a huge competitive advantage to the dominant insurer in terms of increasing its probability of remaining in the top spot six years later. In fact, its estimated coefficient means that a BCBS affiliation raises the probability of remaining

in the top spot by 60 percent. However, the results also indicate that BCBS status does little to increase the market expansion of the dominant health insurer six years later among those insurers remaining at the top spot. Finally, it appears that NP status has no independent effect on the tenure or market share expansion of the dominant firm given the consistently insignificant estimates on that variable.

One potential problem with the analysis, thus far, is the potential for multicollinearity existing between each of the top two markets shares and the NP and BCBS dummy variables. However, the simple correlation among the market shares and the BCBS and NP variables never exceeds 0.247. Also, we checked for nonlinearities between each of the initial market shares and market share six years later by specifying a quadratic function (in logs) but no such relationships are found. Lastly, we examined the sensitivity of the results with respect to including and not including the BCBS dummy variable and limiting the sample to only BCBS observations but the results remain qualitatively unchanged.

IV. Conclusion

The AMA has now published eleven editions of its report on competition in health insurance markets. Based on estimates of the HHI in the various MSAs, the AMA has consistently reported that most health insurance markets in the United States are noncompetitive. This study, however, peels back the layers of the HHI onion using data from the AMA and shows a considerable amount of competition takes place in the various health insurance markets across the United States as evidenced by the churning of leading insurers' market shares.

For example, 30 percent of all dominant PPO insurers lose their top spot after 6 years and rarely do they fall back to the second spot. Instead they apparently land in a third or lower-level position or shift to another product or geographical market. Moreover, only 12 percent of the second-largest PPO insurers hold on their spot and rarely do they replace the dominant insurer when that position is vacated. Finally, regression analysis reveals that a greater market presence does not enhance the chance that the leading health insurer remains in its top spots. The results do indicate that market expansion six years later is enhanced by a larger market share in the initial year but the effect is relatively small. If anything, BCBS status appears to provide some stickiness to the tenure of the dominant firm. Based on these findings, insurance regulators may want to consider both the HHI and the actual churning of market shares among leading firms when considering the competitive nature of specific health insurance markets.

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