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The Impact of Market Power and Economies of Scale on Large Group Health Insurer Profitability

Patricia H. Born,[1] Linda Hughen,[2] and E. Tice Sirmans[3]

Abstract: Following the passage of the Affordable Care Act in 2010, financial reports by commercial health insurers include more detailed information on a Supplemental Health Care Exhibit. Using these data, we analyze the financial performance of all insurers offering large group health insurance aggregated to the group level from 2010 to 2018. The group-level underwriting gains of the largest three insurers were significantly higher and significantly less variable than those of all other insurers. In a multivariate analysis using ordinary least squares, we compare per-member premiums, claims, and operating expenses of the three largest insurers to those of all others. We find no statistically significant difference in premiums or claims per member. However, we find that the largest three insurers have significantly lower general and administrative expenses than all other large group insurers. While our findings indicate that the top three insurers have achieved economies of scale, their cost savings result in higher insurer profits rather than lower consumer premiums. The importance of market share as a driver for insurer-level profitability may lead to a future decline in competition, an increase in market concentration, or both if underperforming insurers with lower market share begin to exit the market. [Key words: health insurance, employer-sponsored health insurance, economies of scale] JEL Classification Codes: G22, I13

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INTRODUCTION

Enrollment in private health insurance is focused among the largest insurers, igniting concerns about health insurance market structure and its potential impact on premiums and insurer profits (e.g., Dafny, 2015a; Dafny, 2015b; Government Accountability Office, 2019). The distribution of enrollment in the large-group market is no exception. In 2018, almost half of all Americans received health insurance coverage through their employer (Kaiser Family Foundation, 2018).[4,5] Although employers typically subsidize a portion of the health care premiums that are negotiated with the third-party insurer, research shows that employers pass along at least part of their cost to employees in the form of either lower wages or reduced benefits (Baicker and Chandra, 2006; Anand, 2017). From 2008 to 2018, the estimated cost of a large group family plan increased 56 percent, a rate that is twice the growth in wages and three times the growth in inflation (Rae, Copeland, and Cox, 2019).

In the fully-insured large-group insurance market, the employers determine which insurer(s) to contract with along with the coverage options, and the employers negotiate the price of the policies with third-party insurers. Employees have little or no say despite paying at least part of the premium plus additional out-of-pocket costs. Together, these factors highlight the importance of studying the large-group insurer market. This study finds that since 2010, aggregate underwriting gains generated by the 149 insurers over the nine-year period are over $22 billion, yet nearly half of the insurers reported cumulative losses. The three largest large-group insurers, at the group (i.e., national) level, accounted for 30 percent of the enrollment in the fully-insured large group market, but over 60 percent of the market's underwriting gains.[6] The same three health insurers held a "top 3" rank for this entire period.

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[4]The total group market, including small and large group enrollees, accounted for 57% of non-elderly health insurance coverage in 2017. (Summary based on Kaiser Family Foundation analysis of the Census Bureau's American Community Survey. See https://www.kff.org/state-category/health-coverage-uninsured/health-insurance-status/.) Our sample includes employer-based plans that are fully insured by a health insurance company. In addition, due to differences in reporting requirements, our sample does not include data for insurers that report in California. See Cole, He, and Karl (2015) and Cicala, Lieber, and Marone (2019) for other studies that utilize the NAIC health insurer data but exclude the state of California.

[5]Employer-sponsored health insurance may be classified as small-group or large-group plans based on the size of the employer. This study only examines large-group plans and, in particular, those where the risk of the insured population is transferred from the employer to a third-party insurer (i.e., fully-funded).

Insurer size is especially relevant when evaluating the function of health insurance markets, where policymakers are particularly focused on balancing affordability of coverage with availability of coverage. Markets characterized by many small insurers may offer consumers more choices, and competition among these insurers will generally constrain underwriting returns. However, large insurers can exercise greater control, through potential negotiating power, over hospitals and providers than small insurers, which may help them keep costs down. Larger health insurers are also able to spread fixed costs associated with the administration of health insurance coverage over a larger population. Whether large health insurers exhibit market power and economies of scale in the administration of health insurance and, further, whether these insurers simultaneously achieve greater underwriting profits, when compared to small insurers, particularly in a time period marked by substantial health care reform, remains an empirical question.

In the current study, we highlight the significant differences in operating expenses and underwriting profit margins across two groups of private health insurers issuing employer health plans in the large-group market: the "Top 3" and "All Others," which differ in size but otherwise report similar premiums and claims experience. Using annual financial data compiled by the National Association of Insurance Commissioners (NAIC), with underwriting profit margin defined as underwriting profitability (premiums less claims and expenses) scaled by premiums, we find the average underwriting profit margin of the "Top 3" was significantly higher—3 percent for the period 2010–2018—compared to an average underwriting profit margin of –0.01 percent for "All Others."[7] Figure 1 shows that the average profit margins of the "Top 3" were not only higher but also less variable than those of "All Others."

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[6]Based on authors' evaluation of insurer data. The data and sample period are discussed in more detail in the "Data and Methodology" section. The GAO (2019) reports that "In 2015 and 2016, states' overall large group health insurance markets remain concentrated, as in prior years. On average, there were 10 participating issuers in each state in 2016. However, in that same year, the three largest issuers held at least 80 percent market share in 43 of 51 states, which is generally consistent with prior years" (p. 29). While the GAO report is based on state-entity-year data from the Medical Loss Ratio filings to the Centers for Medicare and Medicaid, our data, compiled by the NAIC, are aggregated to the national group level.

[7]Results are based on two-tailed t-tests of the mean underwriting profit margin of the "Top 3" versus "All others," significance at the 5 percent significance level. Additionally, we test the difference of the median underwriting profit margins of the two groups using Wilcoxon rank sum tests and find that insurers in the "Top 3" have a median underwriting profit margin that is significantly higher than "All Others," significance at the 1 percent level. Results are available from the authors upon request.
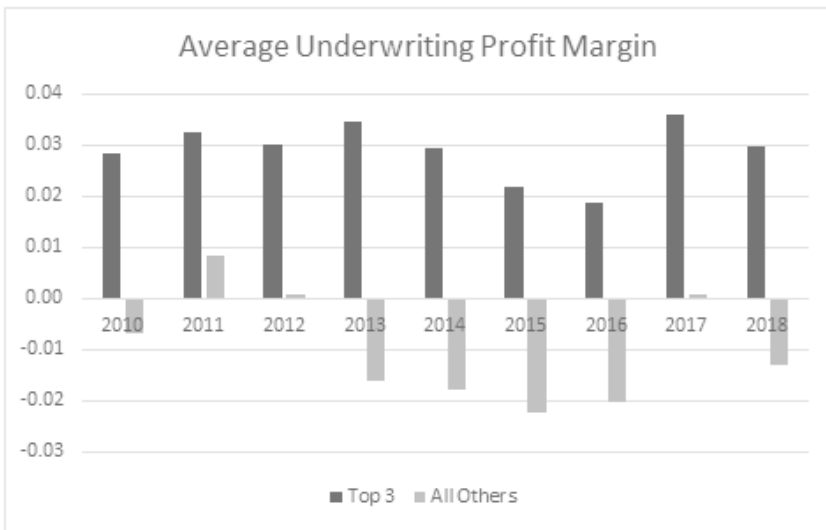
Fig. 1. Average underwriting profit margin.

The average premium per enrollee and the gross underwriting margin, defined as premiums less claims, did not differ significantly across the two groups of insurers. However, average per-enrollee operating expenses was significantly lower among the "Top 3" compared with "All Others."[8] The "Top 3" insurers benefit from significantly lower operating expenses yet do not appear to pass these cost savings along to enrollees in the form of lower premiums.

We document significantly lower expenses along with significantly higher underwriting profit margins in the large group fully-insured market in the period 2010–2018, indicating the presence of economies of scale among the largest insurers in the market. To the extent that economies of scale in the administration of health insurance are identified among large health insurers, smaller insurers may find it difficult to compete. These findings contribute to the literature because an unequal distribution of profits across insurers may lead to a future decline in competition, an increase in market concentration, or both. Changes in market structure may then lead to further increases in premiums or have non-economic impacts such as a reduction in the quantity or quality of medical care covered under plans.

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[8]Results based on two-tailed t-tests of the means.

Our paper proceeds as follows. In the next section, we review prior literature related to concentration, competition, and economies of scale in health insurance markets. A description of the data and methodology are provided in the third section, along with a discussion of the empirical results. A final section concludes.

RELATED LITERATURE

Our paper draws from three main areas of research: (1) health insurer economies of scale, (2) insurer performance related to size and diversification, more generally, and (3) health insurer market power. In the health insurance industry, one key motivation for evaluating health insurer size stems from concerns about whether and how growth, often in the form of mergers and acquisitions, affects market power.[9] Large insurers with greater market power can potentially negotiate better rates for medical services but can also command higher prices from policyholders. As mentioned in her Congressional Testimony on Feb. 14, 2018, Prof. Dafny states that "Potential sources of scale economies include bulk purchasing discounts, elimination of redundant activities (e.g., billing and collection units or corporate headquarters), and reoptimization or reallocation of activities across sites."[10] In his Testimony on the same day, Prof. Gaynor states that "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."[11]

In the 1970s and early 1980s, a period marked by significant growth in U.S. health care costs and intense public policy interest in the role of health insurance, researchers reported evidence of economies of scale among health insurers. Blair, Jackson, and Vogel (1975) built initial models of scale economies in the administration of health insurance. In their study of commercial health insurers issuing plans between 1968 and 1970, they found strong evidence of scale economies through multiple regression analysis of administrative costs using a variety of functional forms. Feldman and Greenberg (1981) found that Blue Cross plans enjoyed discounts when market share was large, and the discount further increased Blue

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[9] See Gaynor and Town (2011) for a review of competition in healthcare and health insurance markets.

[10] See pages 14–15: https://docs.house.gov/meetings/IF/IF02/20180214/106855/HHRG-115-IF02-Wstate-DafnyL-20180214.pdf <Last accessed September 22, 2019>

[11] See page 5: https://docs.house.gov/meetings/IF/IF02/20180214/106855/HHRG-115-IF02-Wstate-GaynorM-20180214.pdf <Last accessed September 22, 2019>

Cross market share. The results of these early studies suggest economies of scale may be expected in health insurance, but the value of these studies is perhaps limited given the dramatic changes to health insurance markets that have occurred since the 1980s, i.e., the growth in managed care plans.

The growth of managed care led to a shift in research focus. Whether, how, and through what channel managed care was implemented and its effects on policyholders was an area of rich research through the 1990s and early 2000s (see, e.g., Miller and Luft, 1994; Glied, 2000; Schield, Murphy and Bolnick, 2001). Glied (2003) offers a comprehensive overview of the impact that managed care implementation in the 1990s had on overall health care cost increases. Nahata, Ostaszewski, and Sahoo (2005) find that cost-sharing, often the keystone of managed care plans, may be the "single most important factor in capping the rise in medical expenditures" (p. 100). Altogether, managed care and its effectiveness in its avowed goal of curbing healthcare costs was evaluated extensively through these two decades.

Analyses of insurer performance are often linked to the potential for achieving economies of scale. An understanding of the opportunity to achieve scale economies in insurance markets has important implications for insurers and policyholders alike. Larger insurers can achieve economies of scale in that the fixed costs of production (i.e., administrative expenses) can be spread over a larger group of outputs (i.e., claims). Existing studies of the property and casualty insurance market have found mixed evidence of economies of scale (see, e.g., Johnson, Flanigan, and Weisbart, 1981; Cummins and Xie, 2013) and suggests that economies of scale can be achieved via growth, but expansion beyond some level may lead to inefficiencies.[12]

In recent years, several major health insurer mergers were announced, including Aetna-Humana, Anthem-Cigna, and Centene-HealthNet. Although each merger was subsequently terminated, had one or more passed, insurer market structure would have been fundamentally changed. Mergers, and the ability of a firm to hold a large portion of market share in general, are typically promoted as offering a number of potential benefits to both shareholders and members. High market share increases brand name recognition and may enhance an insurer's reputation. This may help an insurer improve relationships with health care providers, employers offering group insurance, and members selecting among plans offered by their employers. As insurer reputation increases, the ability to negotiate discounts with health care providers may also increase, a reflection of increasing market power. Mergers and/or organic increases in market share may also provide firms with improved economies of scale by spreading

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[12]These inefficiencies might arise from management and coordination issues, for example.

costs that are largely fixed in nature, such as billing and collection, customer service, information technology, advertising, corporate salaries, and other corporate overhead, over more members, therefore reducing the net general and administrative cost per member. This study extends the literature on the relationship between economies of scale and firm performance. We examine whether insurers with the highest market share have the lowest operating (non-claims) costs.

The increase in financial performance that may be achieved by insurers with greater market share relates not only to economies of scale, but also to market power and, more specifically, pricing power. Much of the literature examining the relationship between market structure and financial performance in the health insurance industry measures market power as market concentration on a state or local level. A frequently used measure of financial performance in these studies is the premium.

Insurer market power allows insurers to charge higher large-group insurance premiums to more profitable employers (Dafny, 2010). An analysis of the Aetna-Prudential merger in 1999 on premiums in the large group market finds that premiums increased not only for the newly merged insurer; competitors also increased premiums. The authors conclude that consolidation in the health insurance industry leads to higher employer-sponsored health insurance premiums (Dafny, Duggan, and Ramanarayanan, 2012). As opposed to a merger, the Patient Protection and Affordable Care Act led to an *increase* in the number of health insurers offering coverage. Dafny, Gruber, and Ody (2015) find that adding one more insurer to the marketplace *reduces* premiums by 4.5 percent. The findings have an important impact on health care of the population. An increase in insurer premiums results in a reduction in coverage in the individual market (Bates, Hilliard, and Santerre, 2012).

Theoretically, insurer premiums may be negatively related to market concentration if insurers with strong market power can negotiate lower costs with health care providers and pass along lower costs in the form of reduced premiums charged to employers and/or lower claims costs incurred by members. Studies examining the interaction of concentration in insurer markets and provider markets have indeed found evidence of a negative relationship between premiums and market concentration. Trish and Herring (2015) find that higher levels of insurer concentration in the markets where insurance is sold to employers are associated with higher insurance premiums. However, higher levels of concentration among the market in which insurers bargain with hospitals are associated with lower premiums. Ho and Lee (2017) find that while consumer welfare decreases and premiums typically increase as a result of decreasing competition, premiums can decrease when a small insurer is removed if the employer

effectively negotiates with remaining insurers. The authors note that employers constrain the offerings in the large group market, limiting the extent to which premiums can rise following a reduction in competition. Scheffler and Arnold (2017) find that insurers operating in highly concentrated markets have the bargaining power to reduce provider reimbursements in highly concentrated provider markets. The study finds that hospital admissions and certain specialists' fees were between 5 and 19 percent lower when provider and insurer concentration are high.

Much of the research as to the steady rise in large-group premiums over the last decade examines concentration in the health insurance industry. A study conducted by the U.S. Government Accountability Office found that the three largest insurers in each state hold 80 percent or more of the market share in at least 40 states in each year between 2011 and 2016 (Government Accountability Office, 2019). Although insurance plans are regulated at the state level, competition may be the strongest among insurers at the metropolitan statistical area. Fulton (2017) finds that 57 percent of metropolitan statistical areas were highly concentrated for health insurers. Highly concentrated insurer markets are associated with higher employer-sponsored premiums (Dafny, 2010; Dafny et al., 2012; Dafny et al., 2015; Trish and Herring, 2015; Ho and Lee, 2017).

This study extends the literature on the relationship between market concentration and premiums in several ways. First, prior studies measure market power as market concentration in state or local markets to contribute to our understanding of the impact of mergers and an increasingly consolidated industry. Second, while market power is related to concentration, it is not equivalent. Nissan (2003) examines two commonly used measures of concentration, HHI and Theil's entropy, and a measure of market share to various lines of property and liability insurance and finds that market share plays an important role in understanding market power. Third, this study examines the possibility that market power can lead not only to differences in premiums between firms with higher and lower market shares, but also to differences in claims if firms with greater market share negotiate lower provider reimbursements resulting in lower claims. To summarize, this study extends the previous literature by examining whether premiums and/or claims differ between the "Top 3" insurers and "All Others."

Our study also extends the work of Cole et al. (2015), who examine the relationship between state-level market concentration and insurer profitability, where profitability is defined as premiums less claims. They find a positive relationship between concentration and profitability but do not attempt to distinguish whether this result is due to anticompetitive behavior or greater efficiency of larger health insurers. Specifically, we attempt

to answer the following questions: (1) Do insurers with the highest market share ("Top 3") charge higher premiums than other insurers ("All Others"), consistent with market power? (2) Do the "Top 3" use bargaining leverage with providers allowing them to incur lower claims as compared to "All Others"? (3) Do the "Top 3" have lower operating (non-claims) costs than "All Others"? (4) If the "Top 3" have lower claims or lower operating expenses, do they pass along cost savings in the form of lower premiums?

DATA, METHODOLOGY, AND EMPIRICAL RESULTS

Data

Following the passage of the Affordable Care Act in 2010, the National Association of Insurance Commissioners (NAIC) required all insurance entities that issue commercial health insurance to report enrollment, premiums, claims, and other expenses on a state level and by line-of-business.[13] We utilize these data as compiled by the NAIC and sourced through S&P Global. Specifically, we use data reported on Part 1 of the Supplemental Health Care Exhibit (SHCE) for the years 2010–2018 that pertain to the large-group line of business. Figure 2 provides an excerpt of a filing for one insurer-state-year. While the SHCE data are reported at the annual firm-state level, following prior literature, we aggregate the firm-state-level data reported in the SHCE to the national insurer-group level where an "insurer" in our sample refers to either an aggregated group of firm-state insurers or an insurer that operates as a single entity (Berry-Stolzle, Liebenberg, Ruhland, and Sommer, 2012; Morris, Fier, and Liebenberg, 2017). Our sample contains between 122 and 128 insurers across the nine years.[14] Our sample includes data from health insurers that report positive values of premiums, claims, and operating expenses with more than 1,000 enrollees during the year.[15] Our final sample is 1,119 insurer-year observations.

The performance data included in this study relate only to fully-insured plans and do not include profits generated by administrative-only plans. Our measures of premiums, claims, and underwriting gains correspond directly to specific items on the SHCE: Adjusted Premiums Earned (line 1.8), Total Incurred Claims (line 5.0), and Underwriting Gain/(Loss)

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[13]The data are reported annually on a company and state basis for all states other than California, which is subject to different reporting requirements.

[14]We include insurers that operate as members of a group and insurers that operate as single entities, aggregating at the group level where appropriate.

[15]Our sample includes both health insurers and life insurers that issue health insurance policies in the large-group market.

SUPPLEMENT FOR THE YEAR 2017 OF THE Community Insurance Company
SUPPLEMENTAL HEALTH CARE EXHIBIT - PART 1

REPORT FOR: 1.
CORPORATION   Community Insurance Company   2. 4361 Irwin Simpson Road Mason, OH 45040-9498
                                                   (LOCATION)

NAIC Group Code   0671   BUSINESS IN THE STATE OF   Ohio   DURING THE YEAR   2017   NAIC Company Code   10345

	Comprehensive Health Coverage			Government Business (excluded by statute)	Other Health Business	Medicare Advantage Part C and Medicare Part D Stand-Alone Subject to ACA	Uninsured Plans
	Individual	Small Group Employer	Large Group Employer				
1. Premium:							
1.5 Federal taxes and federal assessments	24,312,680	32,074,905	26,523,783	509,417	23,718,876	8,953,274	55,120,060
1.6 State insurance, premium and other taxes (Similar local taxes of $109,086)	8,501,316	6,910,318	13,093,703	0	5,994,896	179,912	859,900
1.7 Regulatory authority licenses and fees	74,206	44,150	35,596	0	40,959	165,664	109,475
1.8 Adjusted Premiums Earned	503,851,651	784,420,342	2,527,629,895	990,583	370,846,823	1,412,781,694	XXX
5. 5.0 Total Incurred Claims	433,108,580	646,776,575	2,298,301,274	(20)	289,850,522	1,212,904,293	XXX
6.6 Total of Defined Expenses Incurred for Improving Health Care Quality (Lines 6.1+6.2+6.3+6.4+6.5)	5,166,927	7,598,199	21,246,403	0	1,023,880	33,120,346	74,068,810
8. Claims Adjustment Expenses	7,824,857	9,936,976	27,451,184	0	5,841,815	28,098,211	114,605,930
10. General and Administrative (G&A) Expenses:	31,603,936	60,808,675	135,983,895	504	29,287,274	126,742,609	237,852,002
11. Underwriting gains	27,716,286	59,299,917	46,320,578	0	14,234,530	24,315,451	37,234,931

Fig. 2. Supplemental Health Care Exhibit excerpt.

(line 11). Operating expenses are measured as the sum of Defined Expenses Incurred for Improving Health Care Quality (line 6.6), Total Claims Adjustment Expenses (line 8.3), and Total General and Administrative Expenses (line 10.5). Underwriting gains (losses) (line 11) differ from net gain (loss) because they do not include income from fees of uninsured plans (non–risk bearing or administrative-only plans), net investment and other gain (loss) or federal income taxes. We examine underwriting gain (loss) instead of net income (net gain) because it is more indicative of insurers' performance in their core underwriting operations. Each variable used in our study is scaled by the number of members. Therefore, all variables used in the analysis are annual dollar values on a per-member basis.

We define the "Top 3" insurers based on annual enrollment, measured by number of covered lives shown on page 2 of Part 1 of the SHCE. The three largest insurer groups, at the national level, in the large-group employer market, Anthem Inc., UnitedHealth Group, and Health Care Service Corporation (HCSC), an independent licensee of the Blue Cross and Blue Shield Association, remained the same throughout our sample period although there was some movement among their respective rankings by year.

Our dependent variables are four outcomes associated with insurer performance: *Expenses*, *Premiums*, *Claims*, and *Underwriting Gains (Losses)*. Following prior insurer performance literature, we construct the following control variables. Berger, Cummins, Weiss, and Zi (2000) suggest that insurers who specialize can maximize value by focusing on core businesses and core competencies (p. 324), but it is also possible that insurers achieve economies of scope by sharing inputs of production across lines. While the authors find mixed evidence in favor of either outcome, the extent of focus may control for the insurer's business across other lines, which could affect any one of our outcomes of interest. Morris et al. (2017) investigate the relationship between diversification strategy and firm performance in the U.S. property-liability insurance industry. They find that diversification strategies that offer products in similar lines of business are negatively associated with firm performance and diversification across dissimilar lines of business are uncorrelated with firm performance. Because an insurer's strategy with respect to the percent of its premiums or members from various lines of business may affect its profitability, we include two control variables. One measure, *PctGroup*, is defined as the total adjusted premiums in large group divided by total adjusted premiums across all lines of business. The second measure, *MonolineLgGroup*, is a binary equal to one if the insurer only operates in large group and is thus non-diversified. We also control for the extent of focus on health insurance, more generally, as some insurers in our sample are also providing life insurance

and annuities. Specifically, our sample includes insurers classified in two different filing types—health and life insurers. The former type is focused solely on health insurance risks while the latter bears both health and mortality risks. Thus, we include the control variable *LifeIns,* which is a binary variable equal to one if the insurer reports as a life insurer to further capture the effects of focus on our outcome measures.

We include a control variable that captures the degree to which the health insurer has access to capital from other sources and faces potential conflicts of interest among policyholders, owners, and managers. Prior research indicates that insurers in different organizational forms use different production technologies, which influences efficiency (Cummins, Weiss, and Zi, 1999). Adamson, Eckles, and Haggard (2014) investigate the differences in opacity, or the uncertainty that sophisticated investors face when determining firm value, and find that mutual insurers are more opaque than stock insurers. Chen and McNamara (2014) find that organizational form impacts insurer efficiency. Based on these studies, we include *Stock*, a binary variable equal to one if the insurer is a stock insurer, zero if it is mutual insurer. Consistent with Born (2001), we include controls for the levels of competition and/or economic climate faced by sample insurers. We include the variable *NumStates*, the number of states each insurer operates in. Finally, we include year indicator variables in each estimation.

Methodology

Our analysis proceeds in several stages. We begin by examining changes in enrollment and premiums for the entire sample over the nine-year period. For each of the two groups, "Top 3" and "All Others," we examine per-enrollee-year averages for premiums, claims, premiums less claims, operating expenses, and underwriting gains. For each insurer-year, we also examine average claims, operating expenses and profit margin. We conduct univariate tests of the differences in means of each variable between the two groups.[16]

We follow the approach of Blair, Jackson, and Vogel (1975) and apply a multiple regression analysis to test for market power and scale economies. Specifically, we estimate the following model using ordinary least squares (OLS):[17]

$$Outcome_{i,t} = \beta Top3_{i,t} + \psi X_{i,t} + \phi I_t + \varepsilon_{i,t} \qquad (1)$$

[16]Tests of differences in median values provide similar results and are available from the authors upon request.

[17]We also estimated the model using a panel regression approach and obtained quantitatively similar results.

where $Outcome_{i,t}$ is either the insurer i's operating *Expenses*, *Premiums*, *Claims*, or *Underwriting Gains* in year t, and each metric is scaled by total number of enrollees in the large group market. Our variable of interest, $Top3_{i,t}$ is an indicator equal to one if the insurer is one of the "Top 3" (i.e., Aetna Group, UnitedHealth Group, and HCSC) and zero otherwise. $X_{i,t}$ is a vector containing our five control variables—*PctGroup*, *LifeInsurer*, *MonolineLgGroup*, *Stock*, and *NumStates*. I_t represents year fixed effects and $\varepsilon_{i,t}$ is a random error term. Standard errors account for insurer clustering. Table 1 provides our variable definitions, summary statistics and univariate results from two-tailed t-tests.

In the *Premiums* specifications, we expect a positive and significant coefficient on *Top3* if market share is associated with pricing power and the insurers with the greatest market share are charging higher premiums to employers. On the other hand, if market share is associated with bargaining leverage and insurers with the highest market share are able to negotiate lower prices with health care providers, we expect a negative and significant coefficient on *Top3*. In the *Claims* specifications, we expect a negative and significant coefficient on *Top3* if, similar to that mentioned above, insurers with the highest market share are able to negotiate lower costs of medical services with health care providers. In the *Expenses* specification, we expect a negative and statistically significant coefficient estimate for *Top3*, indicating significantly lower expenses for the top insurers. Finally, in the *Underwriting Gains* specification, we expect a positive and statistically significant coefficient estimate for *Top3*, indicating significantly higher underwriting gains for the top insurers. Taken together, the significantly lower expenses and higher underwriting gains for *Top3* health insurers—with no significant difference in premiums and claims—will provide evidence of economies of scale advantages for the top insurers.

Empirical Results

As reported in Figure 1, in the fully-insured large-group market, average underwriting profit margins of the "Top 3" ranged from a low of 1.9 percent in year 2016 to a high of 3.6 percent the following year. Across the sample period, underwriting margins had a standard deviation of 1 percent. However, average underwriting margins of "All Others" varied dramatically throughout the sample period, from a low of negative 2.2 percent in 2015 to a high of just under 1 percent in 2011. Across the period, underwriting margins of "All Others" had a standard deviation over eight times greater than that of the "Top 3."

In the fully-insured large-group market, aggregate premiums increased 13 percent while aggregate enrollment *decreased* by 16 percent

Table 1. Variable Definitions and Summary Statistics

| Variable		"All Others" N = 1092		"Top 3" N = 27		t-tests
		Mean	Std Dev	Mean	Std Dev	
Expenses	Sum of quality improvement, claims adjustment and general/administrative expenses, scaled per enrollee	484.17	230.48	327.88	53.18	***
Premiums	SCHE line 1.8 scaled per enrollee	4526.78	1047.57	4494.69	689.11	
Claims	SCHE line 5.0, scaled per enrollee	4059.53	990.33	4013.73	675.85	
UW Margin	Premiums less claims and expenses, scaled by total adjusted premium	−0.01	0.08	0.03	0.01	**
UW Gains	Premiums less claims and expenses, scaled per enrollee	−29.56	9.20	127.68	7.84	***
PctGroup	percentage of insurer's total premium in large-group market	0.40	0.24	0.36	0.17	
LifeIns	1 if insurer reports as life insurer	0.12	0.33	0.67	0.48	***
MonolineLgGroup	1 if insurer only writes business in large group	0.01	0.07	0	0	
Stock	1 if insurer is stock insurer	0.50	0.44	0.62	0.45	***
NumStates	Number of states in which the insurer operates	1.77	3.14	8.48	8.02	***

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
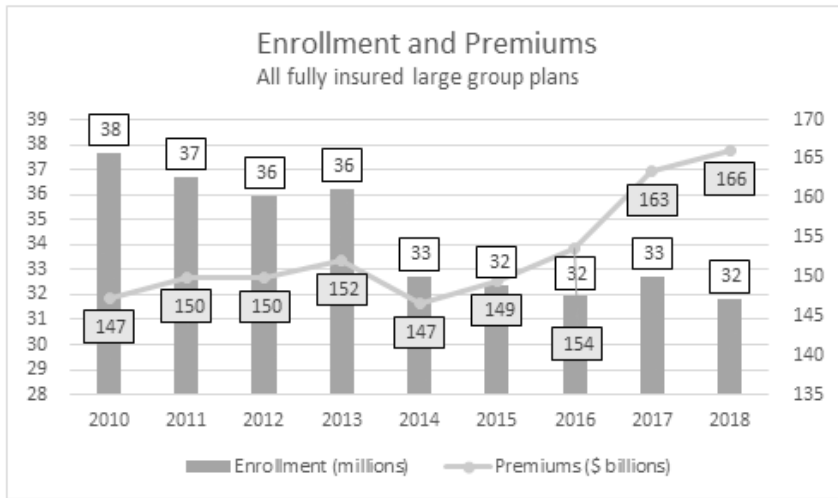
Fig. 3. Enrollment and premiums.

over the nine-year period, as shown in Figure 3.[18] As indicated in Figure 4, the "Top 3" have lower aggregate premiums but higher aggregate gains than "All Others," with the exception being the year 2011. While both "Top 3" and "All Others" report consistent premiums over time (as seen in Panel B of Figure 4), only the "Top 3" were able to maintain stability in underwriting gains over time (as seen in Panel A of Figure 4).[19] Only four insurers—the three largest and the fifth largest in terms of enrollment—are profitable in every year in our sample. In analysis not shown here, we find that 43 percent of sample insurer-years involve losses and a surprising 47 percent of insurers have cumulative losses across the entire nine-year period.

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[18]The average premium per enrollee in the fully-insured large-group market was $3,925 in 2010 and $5,138 in 2018. Premiums may be increasing due to higher costs of providing insurance (claims), costs of operating the business (operating expenses), desired profits, or a combination of these or other potential factors.

[19]One potential explanation for the consistently higher and less variable underwriting margins of the "Top 3" insurers (as seen in Figure 1) is that those insurers are charging higher premiums. We examined the average per-enrollee premium charged by each of the two groups. The difference was not statistically significant in any year. Since premiums reflect insurers' estimates of expected costs per enrollee, this finding suggests the two groups are composed of equally healthy enrollees, on average. To confirm this, we also compare the claims experience for the two groups and find that average claims per enrollee did not differ significantly between the two groups in any year.
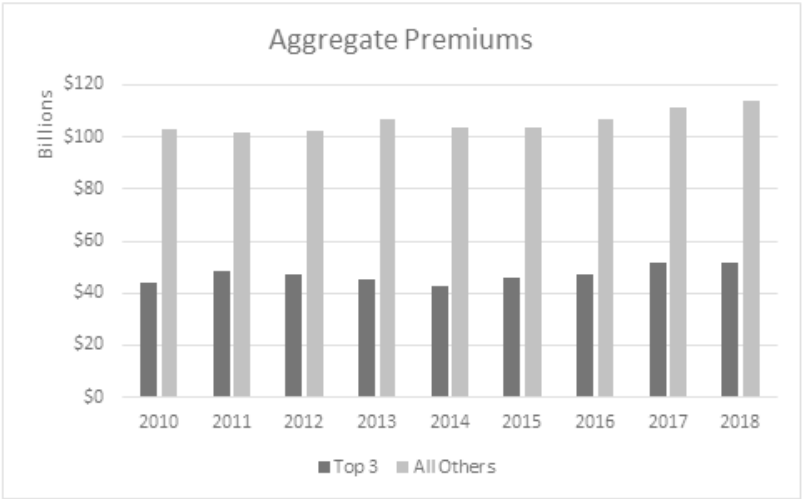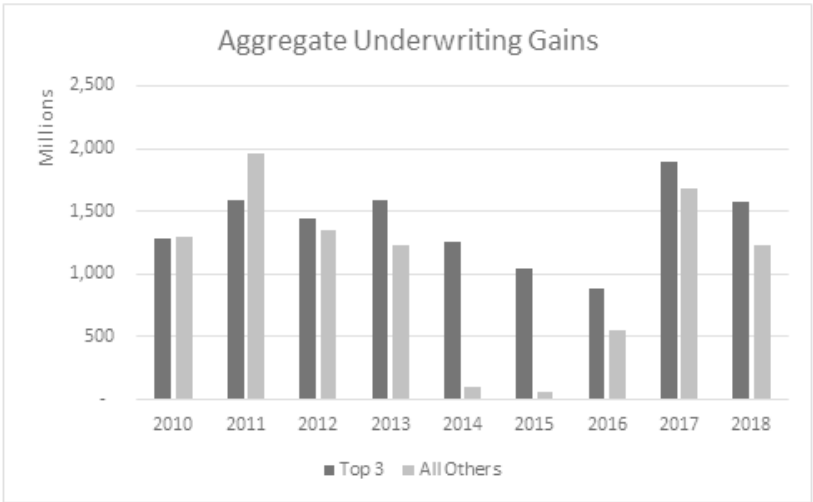
Fig. 4. Panel A: Aggregate premiums.

Fig. 4. Panel B: Aggregate underwriting gains.

Table 1 reports the means and medians over the entire sample period for tests for differences between the two groups of insurers. Across the full sample period, average and median levels of *Premiums* and *Claims* are not significantly different. However, *Expenses* are significantly lower for "Top

3" versus "All Others," indicating economies of scale for insurers with the greatest market share. There is no significant difference between the two groups in the percentage of business from the large-group line of business (PctGrp), or the likelihood of an insurer doing business in only the large-group business line. The "Top 3" are more likely to be organized as stock, rather than mutual, companies, but the difference is significant only at the 0.10 level. Unsurprisingly, the number of states that the insurer operates in is significantly higher for "Top 3" than "All Others." The "Top 3" operate in an average of 8.5 states while "All Others" operate in an average of 1.8 states. These statistical differences, other than for stock vs. mutual organization status, are all significant at the 0.01 level. In an untabulated year-specific analysis, we find that Premiums and Claims do not differ between "Top 3" and "All Others" in any individual year.

Table 2 shows results from our estimation of equation (1). Each column represents a different outcome (i.e., *Expenses, Premiums, Claims*, and *Underwriting Gain*). As seen in column 1, the "Top3" insurers have significantly lower expenses than "All Other" insurers. Given that we find no significant difference in *Premiums* and *Claims* but we find significantly higher *Underwriting Gain* in column 4, we provide evidence of economies of scale in the administration of large-group health insurance plans. Taken together with the results that neither *Premiums* nor *Claims* are lower for "Top 3" versus "All Others," these results suggest that insurers with greater market share exhibit pricing power as they are able to charge the same premiums but profit at a much higher rate. The benefits of lower operating expenses due to scale economies are creating value for the insurer, but not necessarily for the consumer.

The estimated coefficients on some of our control variables are significant. The most significant finding is that *MonolineLgGrp* is associated with lower *Expenses*, lower *Premiums*, lower *Claims*, and higher *UnderwritingGains*, suggesting benefits associated with being focused rather than diversified.

CONCLUSION

Nearly half of health insurer metropolitan statistical areas are either moderately or highly concentrated (Fulton, 2017). A report issued by the Government Accountability Office recently noted that the three largest health insurers held at least 80 percent of the market in most U.S. states.[20]

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[20]United States Government Accountability Office Report to Congressional Committees, "Private Health Insurance: Enrollment remains concentrated among few issuers, including in exchanges" (March 2019).

Table 2. Regression Results Ordinary Least Squares

	(1) Expenses	(2) Premiums	(3) Claims	(4) Underwriting Gains
Top3	−149.6569***	259.5316	285.3946	133.4238***
	[50.221]	[329.126]	[310.162]	[39.657]
PctGroup	−111.0270*	379.1679	464.1674	−11.7375
	[65.065]	[373.165]	[359.852]	[83.294]
LifeIns	35.5796	−430.3765	−462.2783	−15.2279
	[70.906]	[442.279]	[397.511]	[48.412]
MonolineLg-Grp	−133.4673*	−1006.7593**	−1039.0673**	209.3642***
	[79.310]	[475.074]	[423.044]	[58.271]
Stock	78.2532**	−190.7376	−161.0242	−105.6297***
	[32.444]	[137.093]	[135.129]	[35.003]
NumStates	−6.0495*	−3.5724	−6.9965	6.8729**
	[3.073]	[28.383]	[26.744]	[2.890]
_cons	387.5420***	4070.4065***	3632.1198***	45.6911*
	[21.545]	[114.393]	[109.465]	[23.559]
R-Sq.	0.108	0.172	0.175	0.058
N	1119	1119	1119	1119

Notes: Standard errors in brackets, clustered at insurer level. Year indicators used but not displayed.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We estimate the model in equation (1) using ordinary least squares with one of four dependent variables representing performance outcomes: *Expenses, Premiums, Claims,* and *Underwriting Gains.*

Highly concentrated insurance markets may be associated with low competition and high prices (premiums). Indeed, research shows that an increase in consolidation in health insurance markets leads to higher prices and calls for additional data on the financial reporting and enrollment of various segments of the commercial health insurance market (e.g., Dafny, 2015a; Dafny, 2015b).

Our findings confirm that the large-group health insurance market is highly concentrated, even on a national level, with one-third of the market held by three insurers. Large insurers, such as the "Top 3" examined in this study, benefit from economies of scale. Our results highlight significantly lower operating expenses incurred by the "Top 3" health insurers in the large-group market. However, rather than passing these cost savings along to members in the form of lower premiums, the "Top 3" insurers reported significantly higher profits than all other insurers in the fully-insured large-group market.

The large-group market has been relatively stable despite the changes to health insurance markets following the passage of the Patient Protection and Affordable Care Act, compared to the individual and small-group markets. However, our findings highlight variations in financial performance and, specifically, the difference in profitability of the "Top 3" health insurers compared to "All Others" in the large-group market. The importance of market share as a driver for insurer-level profitability may lead to a future decline in competition, an increase in market concentration, or both if underperforming insurers with lower market share begin to exit the market. Because over half of the U.S. population receives health insurance through their employer, availability and affordability of coverage in the large-group market may be threatened.

REFERENCES

Adamson, S. R., D. L. Eckles, and K. S. Haggard (2014) "Insurer Opacity and Ownership Structure," *Journal of Insurance Issues* 37(2): 93–134.

Anand, P. (2017) "Health Insurance Costs and Employee Compensation: Evidence from the National Compensation Survey," *Health Economics* 26(12): 1601–1616.

Baicker, K. and A. Chandra (2006) "The Labor Market Effects of Rising Health Insurance Premiums," *Journal of Labor Economics* 24(3): 609–634.

Bates, L. J., J. I. Hilliard, and R. E. Santerre (2012) "Do Health Insurers Possess Market Power?," *Southern Economic Journal* 78(4): 1289–1304.

Berger, A. N., J. D. Cummins, M. A. Weiss, and H. Zi (2000) "Conglomeration versus Strategic Focus: Evidence from the Insurance Industry," *Journal of Financial Intermediation* 9(4): 323–362.

Berry-Stölzle, T. R., A. P. Liebenberg, J. S. Ruhland, and D. W. Sommer (2012) "Determinants of Corporate Diversification: Evidence from the Property–Liability Insurance Industry," *Journal of Risk and Insurance* 79(2): 381–413.

Blair, R. D., J. R. Jackson, and R. J. Vogel (1975) "Economies of Scale in the Administration of Health Insurance," *The Review of Economics and Statistics* 57(2): 185–189.

Born, P. H. (2001) "Insurer Profitability in Different Regulatory and Legal Environments," *Journal of Regulatory Economics* 19(3): 211–237.

Chen, L. R. and M. J. McNamara (2014) "An Examination of the Relative Efficiency of Fraternal Insurers," *The Journal of Insurance Issues* 37(1): 1–31.

Cicala, S., E. M. Lieber, and V. Marone (2019) "Regulating Markups in US Health Insurance," *American Economic Journal: Applied Economics* 11(4): 71–104.

Cole, C. R., E. He, and J. B. Karl (2015) "Market Structure and the Profitability of the US Health Insurance Marketplace: A State-Level Analysis," *Journal of Insurance Regulation* 34(4): 1–30.

Cummins, J. D. and X. Xie (2013) "Efficiency, Productivity, and Scale Economies in the US Property-Liability Insurance Industry," *Journal of Productivity Analysis* 39(2): 141–164.

Cummins, J. D., M. A. Weiss, and H. Zi (1999) "Organizational Form and Efficiency: The Coexistence of Stock and Mutual Property-Liability Insurers," *Management Science* 45(9): 1254–1269.

Dafny, L. S. (2010) "Are Health Insurance Markets Competitive?," *American Economic Review* 100(4): 1399–1431.

Dafny, L. S. (2015a) "Health Insurance Industry Consolidation: What Do We Know from the Past, Is It Relevant in Light of the ACA and What Should We Ask?" https://www.judiciary.senate.gov/imo/media/doc/09-22-15%20Dafny%20Testimony%20Updated.pdf (last accessed September 22, 2019).

Dafny, L. S. (2015b) "Evaluating the Impact of Health Insurance Industry Consolidation: Learning from Experience," The Commonwealth Fund, https://www.commonwealthfund.org/publications/issue-briefs/2015/nov/evaluating-impact-health-insurance-industry-consolidation (last accessed September 22, 2019).

Dafny, L. S., M. Duggan, and S. Ramanarayanan (2012) "Paying a Premium on Your Premium? Consolidation in the US Health Insurance Industry," *American Economic Review* 102(2): 1161–1185.

Dafny, L. S., J. Gruber, and C. Ody (2015) "More Insurers Lower Premiums: Evidence from Initial Pricing in the Health Insurance Marketplaces," *American Journal of Health Economics* 1(1): 53–81.

Feldman, R. and W. Greenberg (1981) "The Relation Between the Blue Cross Market Share and the Blue Cross 'Discount' on Hospital Charges," *Journal of Risk and Insurance* 48(2): 235–246.

Fulton, B. D. (2017) "Health Care Market Concentration Trends in the United States: Evidence and Policy Responses," *Health Affairs* 36(9): 1530–1538.

Gaynor, M. and R. J. Town (2011) "Competition in Health Care Markets," in *Handbook of Health Economics,* vol. 2, pp. 499–637. Elsevier.

Glied, S. (2000) "Managed Care," in *Handbook of Health Economics*, vol. 1, pp. 707–753. Elsevier.

Glied, S. (2003) "Health Care Costs: On the Rise Again," *Journal of Economic Perspectives* 17(2): 125–148.

Government Accountability Office Report to Congressional Committees (2019) "Private Health Insurance: Enrollment Remains Concentrated among Few Issuers, Including in Exchanges," https://www.gao.gov/assets/700/697746.pdf (last accessed September 22, 2019).

Ho, K. and R. S. Lee (2017) "Insurer Competition in Health Care Markets," *Econometrica* 85(2): 379–417.

Johnson, J. E., G. B. Flanigan, and S. N. Weisbart (1981) "Returns to Scale in the Property and Liability Insurance Industry," *Journal of Risk and Insurance* 48(1): 18–45.

Kaiser Family Foundation (2018) "Employer Health Benefits 2018 Annual Survey," http://files.kff.org/attachment/Report-Employer-Health-Benefits-Annual-Survey-2018 (last accessed September 22, 2019).

Morris, B. C., S. G. Fier, and A. P. Liebenberg (2017) "The Effect of Diversification Relatedness on Firm Performance," *Journal of Insurance Issues* 40(2): 125–158.

Miller, R. H., and H. S. Luft (1994) "Managed Care Plan Performance since 1980: A Literature Analysis," *Journal of the American Medical Association* 271(19): 1512–1519.

Nahata, B., K. Ostaszewski, and P. Sahoo (2005) "Rising Health Care Expenditures: A Demand-Side Analysis," *Journal of Insurance Issues* 28(1): 88–102.

Nissan, E. (2003) "Relative Market Power Versus Concentration as Measure of Market Dominance: Property and Liability Insurance," *Journal of Insurance Issues* 26(2): 129–141.

Rae, M., R. Copeland, and C. Cox (2019) "Tracking the Rise in Premium Contributions and Cost-Sharing for Families with Large Employer Coverage," Peterson Center on Healthcare and Kaiser Family Foundation.

Scheffler, R. M. and D. R. Arnold (2017) "Insurer Market Power Lowers Prices in Numerous Concentrated Provider Markets," *Health Affairs* 36(9): 1539–1546.

Schield, J., J. J. Murphy, and H. J. Bolnick (2001) "Evaluating Managed Care Effectiveness: A Societal Perspective," *North American Actuarial Journal* 5(4): 95–111.

Trish, E. E. and B. J. Herring (2015) "How Do Health Insurer Market Concentration and Bargaining Power with Hospitals Affect Health Insurance Premiums?," *Journal of Health Economics* 42: 104–114.