

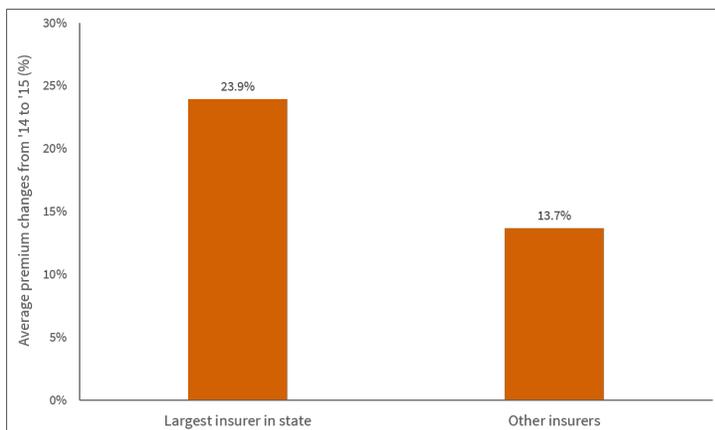


# Larger Issuers, Larger Premium Increases: Health insurance issuer competition post-ACA

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## Highlights

- Health insurance plans on 34 state exchanges are studied for pricing changes from 2014 to 2015
- The largest insurance company in each state on average increased their rates 75% more than smaller insurers in the same state
- The largest insurance companies do not appear to be paying for higher medical costs per premium dollar versus smaller insurers in the reported experience period of 2013.



*Average premium increase from '14 to '15 by insurance company size in states*

## Abstract

The Patient Protection and Affordable Care Act (ACA) has substantially reformed the health insurance industry in the United States by establishing health insurance marketplaces, also called health exchanges, to facilitate the purchase of health insurance. The ACA has increased transparency in insurance pricing and in issuer pricing behavior. Using 2014 and

2015 Unified Rate Review (URR) data, this study examines changes in health insurance premiums made by individual health insurance issuers in 34 federally facilitated and state-partnership health insurance exchanges.

**Results summary:** Our study shows that the largest issuer in each marketplace had a 75% higher premium increase from 2014 to 2015 compared to other same-state issuers ( $p=0.03$ , one-tailed paired t-test). On average, the largest issuers raised rates by 23.9%, while the other issuers only raised rates by 13.7%. Moreover, the largest issuers' premium increase affects a larger proportion of plans ( $p=0.008$ , one-tailed paired t-test) and do not seem justified from the standpoint of incurred claims-to-premium ratio ( $p=0.31$ , one-tailed paired t-test for higher claims ratio) in the reported experience period of 2013. Projected Index Rate from the rate review process is used as a summary of an issuer's premiums across different plans and Projected Member Months as a proxy for on-exchange market share. Our findings suggest that even after the Affordable Care Act, the largest on-exchange issuers may be in a better position to practice anti-competitive pricing compared to their same-state counterparts.

## Introduction

Health insurance has always been a highly consolidated industry. In a 2000-2003 study on HMO and PPO plans for insured and self-insured employer funding arrangements, Robinson finds that the top insurer controlled at least one-third of the market in 38 of the 48 states [1]. Even as recently as 2013, an American Medical Association study showed that in 45 states, the top two health insurers held more than 50% of the market share. Using merger guidelines issued by the U.S. Department of Justice and Federal Trade Commission, the study also finds the insurance industry in 71% of metropolitan areas to be "highly concentrated" [2]. As with any industry with dominant players, consumers are often susceptible to adverse pricing behavior by health insurance carriers (hereafter "issuers").

However, thanks to the Patient Protection and Affordable Care Act (ACA), the health insurance industry has undergone substantial reforms with increased transparency in issuer premium pricing behavior. Specifically, premium changes must now be reviewed through Rate Filing Justification documents (45 CFR § 154.215) and claims, utilization, taxes/fees, and other expenses must be disclosed by the issuers to justify their premium changes. Beyond the rate review process, issuers must also ensure that a minimum proportion of the collected premiums, known as the medical loss ratio (MLR), must be spent on medical expenditure. Premiums in excess of the minimum must be rebated to consumers (45 CFR § 158.240). These changes are intended to ensure fair premium pricing, even among issuers with dominant market shares. So, how is ACA doing?

The introduction of the federal and state marketplaces as well as the creation of the Consumer Operated and Oriented Plan (CO-OP) Program are intended to allow smaller health insurance issuers to compete against the major players. By 2014, 36 new issuers, previously absent from the individual insurance market, joined the exchanges. However, at

the same time, many large issuers refused to join the exchanges to avoid competitive pressures on the marketplaces. National issuers such as Aetna and Humana only participated in a subset of exchanges while UnitedHealthcare chose to sell only off-exchange plans. Using different measures of market competitiveness, including the Herfindahl–Hirschman Index (HHI), a Kaiser Family Foundation study finds that 7 state-based exchanges showed a variety of changes in market competitiveness. While California and New York appear more competitive, Connecticut and Washington are less competitive than their individual markets in 2012 [3].

Are exchanges keeping anticompetitive pricing behavior of dominant issuers in check?

## Background

Since the ACA was only enacted in March 2010 and the first on-exchange plans were only made available in 2014, research on the pricing behavior of marketplace issuers is relatively scarce. One of the rare pertinent studies is by the Department of Health and Human Services. Using the number of issuers as a measure of competition, the study finds that in each of the 36 federally facilitated and state-partnership exchanges, an increase of one issuer is associated with a 4% premium decrease for the second-lowest cost silver plan. This is based on a regression model built upon 2014 premiums data [4] However, it is unclear if the absolute number of issuers is a good measure of competitiveness in the insurance market. After all, the ACA CO-OP Program brought about the creation of many smaller issuers, but many faltered at meeting their targeted market share. A 2015 study by the Government Accountability Office finds that 14 out of 22 participating CO-OPs failed to reach their enrollment target [5]. As long as other issuers cannot threaten the market share of incumbents, the number of issuers in a state is immaterial in determining market competitiveness.

Dafny et al. conducted a similar study, except they used rating areas as their units of study instead of states. Rating areas are state-demarcated regions where a plan's premiums are only allowed to vary according to family structure, age and tobacco use. Using HHI as a measure of competitiveness, Dafny et al. finds that the 2014 on-exchange marketplaces are less competitive than the insurance marketplace in 2011 because a major carrier, UnitedHealthcare, decided not to take part in the 2014 federal marketplace [6]. This decrease in competitiveness, according to a regression model, raised the second-lowest-cost silver plan premiums in each rating area by 5.4% on average. One of the caveats of the study is that the market share of issuers in 2014 was estimated from their 2011 market share. This can be problematic because many issuers have undergone mergers and new issuers have sprung up, thanks to the ACA. Additionally, it may not be fair to compare premiums between plans before and after the ACA given that prior to 2014, plan benefits and designs were not uniform across the board. Starting in 2014, all plans must contain Essential Health Benefits (EHB) (45 CFR § Part 156, Subpart B) and plans on the marketplace must meet minimum Qualifying Health Plan (QHP) standards (45 CFR § Part 156, Subpart C). Most importantly, prior to the

ACA, plans could exclude coverage for pre-existing conditions, resulting in lower prices for 2011 plans. Therefore the lower premiums may not be directly related to the more competitive 2011 market that included UnitedHealthcare's participation.

## Methods

To address the limitations of previous studies and add to the growing literature on issuer competition in the post-ACA regime, we compared the pricing behavior of the biggest individual health insurance issuers of each state under federally facilitated and state-partnership marketplaces with that of other issuers from the same state. Unlike previous work, this analysis examines issuers as the unit of study. Instead of making interstate or inter-rating area comparisons, we compared premium changes from 2014 to 2015 among same-state issuers. This ensures that both interstate and intrastate differences are accounted for.

This paper also introduces novelties in premium and market share determination in an attempt to circumvent some of the caveats noted in previous work. For instance, instead of choosing the premium of a single plan (e.g. second lowest silver plan), we utilized the Projected Index Rate used by issuers in the new premium setting process to summarize the plan premiums of an issuer in a single number for year-over-year comparison. Also, by comparing only changes in the Projected Index Rate, we minimize the effects of plan-specific confounding variables such as differences in healthcare delivery costs and network size when making inter-issuer comparisons.

For market share determination, this paper uses Projected Member Months in the rate setting process as a proxy for market share. This is advantageous as the data is more recent and is a more accurate approximation of on-exchange market share. Unlike other studies that measure number of issuers as a proxy for competitiveness [4, 7], our measure takes into account the relative enrollment shares of same-state issuers in determining market sizes.

This research is especially relevant in light of recent market consolidation attempts by large issuers. While these attempted takeovers have sparked antitrust concerns, proponents of consolidation argue that a dominant issuer can better negotiate medical costs among network providers, passing the cost reductions to consumers [8]. Research on pricing behavior of dominant issuers under the ACA is imperative to evaluate the merits of this argument.

## Approach

The study units in this paper are issuers in different states. For the purpose of this study, an issuer whose coverage area spans multiple states is treated as a distinct entity for each state examined. This is consistent with 45 CFR § 156.80, under which all the individual health insurance plans issued by an issuer in a state have to be considered as a single risk pool.

Only issuers in 34 states with federally facilitated and state-partnership marketplaces are considered since their premiums data is easily available through public Center for Medicare and Medicaid Services (CMS) files. Other states running a state-based marketplace or federally supported state-based marketplace are omitted due to a general lack of data accessibility or consistency.

## Data

This study uses two datasets:

1. 2015 Qualified Health Plans (QHP) Medical Landscape file.

The CMS releases a QHP Medical Landscape file each year showing plans by county with cost-sharing scenarios and premium data [9].

2. 2014 and 2015 Unified Rate Review public use files (PUFs).

Before each open enrollment period, issuers must submit Rate Filing Justification documents for all their plans products stating the new premiums for the upcoming plan year. The documents are composed of several parts, I-III. We will use Part I, which is the Unified Rate Review and must include historical and projected claims data, utilization trend projections and other data (45 CFR § 154.215 (b)) that are posted publicly on the CMS website (45 CFR § 154.215 (h)).

Projected Index Rate as a summary measure for an issuer's premiums across different plans

Before quantifying changes in an issuer's premium, it is important to formulate a measure that summarizes an issuer's premiums across all its plans. This is especially challenging as premiums within the same issuer show wide variations with different plan cost-sharing designs, geographical areas, as well as individual-calibrated factors like age and tobacco use. To complicate things, an issuer may terminate some plans and introduce others during a new plan year.

Most methods in the literature only attempt to measure premium changes for a state marketplace or rating areas, aggregated across all issuers. Dafney et al., for instance, used the second lowest-cost silver plan to represent the premium of a rating area [6]. Another study by the Kaiser Family Foundation used the second lowest-cost silver plan and lowest-cost bronze plan aggregated across issuers as a measure of premiums for each state [10].

The closest study that formulates a measure to summarize premiums for an issuer is by the Government Accountability Office (GAO). In "Private Health Insurance", GAO uses a simple average for premiums across an issuer's plans [5]. However, this measure assumes that different plans and metal tiers are equally enrolled. This is problematic as enrollment is heavily skewed with 69% selecting a silver marketplace plan in 2015 [11].

Another plausible measure is a weighted average of all plan premiums for an issuer using enrollment data specific to the plans. However, this is generally not attempted because plan-level enrollment data is not required to be published. The closest available dataset on enrollment, from the CMS Newsroom, is a state-level snapshot of enrollment with all the issuers combined [12]. Even with the plan enrollment data, we would still require data on the average premium each enrollee pays, since these premiums can vary with age, rating areas (geography) and tobacco usage.

To find a satisfactory summary measure for an issuer's premiums, we turn to the premiums setting process for issuers under 45 CFR § 156.80. The figure below shows the process of premium determination released by the CMS [13].



- **Experience Period Index Rate:** To come up with the final premiums, issuers begin with the Experience Period Index Rate, which is the average allowed claims per member per month (PMPM) for EHBs in the previous year.
- **Projected Index Rate:** Using the Experience Period Index Rate, the issuer adjusts for health costs trends, demographics, and benefits to come up with a projected rate for the upcoming plan year. The rate is basically the anticipated average allowed claims PMPM.
- **Market Adjusted Index Rate:** The Projected Index Rate is adjusted for market-wide modifiers as defined in 45 CFR § 156.80(d)(1) including adjustments for the federal reinsurance program, risk, and marketplace user fees to arrive at the Market Adjusted Index Rate.
- **Plan Adjusted Index Rate:** From the issuer's Market Adjusted Index Rate, the Plan Adjusted Index Rate for each of the issuer's plans is obtained by adjusting for plan-level modifiers as defined in 45 CFR § 156.80(d)(2). These include adjustments for plan Actuarial Value and cost-sharing design, provider network, delivery system, utilization management, non-EHB benefits, administrative costs, and catastrophic plan eligibility variation.
- **Consumer Adjusted Premium Rates:** Consumer Adjusted Premium Rates for each plan are the Plan Adjusted Index Rate adjusted for consumer-level modifiers as defined in 45 CFR § 147.102. These include calibrating for age using the standard age curve and also geography. Other allowable factors include tobacco and family structure. The Consumer Adjusted Premium Rate is the final premium charged to a consumer.

For each issuer there is only one Experience Period Index Rate, Projected Index Rate and Market Adjusted Index Rate. Since the Plan Adjusted Index Rate and Consumer Adjusted Premium Rates are specific to plan and consumer respectively, each issuer has many of them. As such, Plan Adjusted Index Rate and Consumer Adjusted Premium Rates cannot be used as a summary for premiums across an issuer’s plans.

Market Adjusted Index Rate would be ideal as a benchmark for comparison, since it is the rate that saw the most adjustments and is closest to the final premiums shown to consumers. However, as explicitly stated in “2016 Unified Rate Review Instructions”, the Market Adjusted Index Rate is not available in the URR PUF [13]. Theoretically, it can be calculated by dividing Plan Adjusted Index Rate by the Actuarial Value Pricing Value. However, for 2014 data, such a calculation does not provide a consistent number for each issuer within a state.

We chose the next best rate, the Projected Index Rate, as the ideal measure of an issuer’s premiums. The rate is available for both 2014 and 2015 URR PUFs as “Index Rate for Projection Period”, allowing year over year changes to be calculated. To determine if the Projected Index Rate is a good representation of an Issuer’s premiums over all its plans, we carried out the following multilinear regression:

$$\text{Premiums of all plans in different rating areas across US (95,546 data points)} \sim \text{Projected Index Rate of Issuer} + \text{Metal Tier} + \text{Plan Network Type (e.g. PPO, HMO)} + \text{State}$$

The target variable is the premium that consumers eventually see in their own rating area. We chose the premium of a 21-year-old individual for the target variable as the premiums across different ages are now fixed by a federal or state-specific age curve (PHS Act section 2701(a)(1)(A)(iii)), and all premiums for ages 21 and above can be calculated by multiplying the premium of a 21-year-old by a fixed age-dependent factor. From Table 1, the regression model suggests that a simple combination of the Projected Index Rate, two other plan-specific parameters, and the state the plan is offered in can account for 76.5% of all variation in 95,546 premiums across the 34 exchanges in the 2015 Medical Landscape File. This is remarkable since rating areas are not being taken into account. The coefficient of Projected Index Rate, highlighted, is statistically significant at p-value < 0.00001. All these together with the theoretical underpinnings suggest that the Projected Index Rate is a good representation of all the premiums of an issuer across its plans.

Hereafter, the term “premium change” will refer to the year-over-year change in Projected Index Rate for an issuer.

OLS Regression Results			
Dep. Variable:	Premium	R-squared:	0.765
Model:	OLS	Adj. R-squared:	0.765
Method:	Least Squares	F-statistic:	7594

No. Observations:	95546	Prob (F-statistic):	0
Df Residuals:	95504	Log-Likelihood:	-4.70E+05
Df Model:	41	AIC:	9.39E+05
		BIC:	9.40E+05

	coef	std err	t	P> t
Intercept	148.7303	2.143	69.412	0
ProjectedIndexRate	0.1872	0.002	118.962	0
C(Metal)[T.Catastrophic]	-36.0088	0.493	-73.057	0
C(Metal)[T.Gold]	95.3292	0.298	319.43	0
C(Metal)[T.Platinum]	157.7984	0.543	290.679	0
C(Metal)[T.Silver]	46.8603	0.265	176.535	0
PlanNetworkType[T.HMO]	-6.8747	0.639	-10.759	0
PlanNetworkType[T.POS]	4.9553	0.727	6.821	0
PlanNetworkType[T.PPO]	25.1099	0.66	38.062	0
C(State)[T.AL]	-70.6042	1.85	-38.165	0
C(State)[T.AR]	-59.6816	1.721	-34.674	0
C(State)[T.AZ]	-46.9921	1.891	-24.848	0
C(State)[T.DE]	-43.8327	4.109	-10.667	0
C(State)[T.FL]	-22.2946	1.634	-13.644	0
C(State)[T.GA]	-22.9741	1.619	-14.186	0
C(State)[T.IA]	-42.361	1.931	-21.934	0
C(State)[T.IL]	-46.367	1.675	-27.675	0
C(State)[T.IN]	-10.1865	1.553	-6.56	0
C(State)[T.KS]	-95.3133	1.747	-54.549	0
C(State)[T.LA]	-31.0296	1.607	-19.314	0
C(State)[T.ME]	-21.2795	2.152	-9.888	0
C(State)[T.MI]	-42.4392	1.622	-26.167	0
C(State)[T.MO]	-31.6473	1.744	-18.15	0
C(State)[T.MS]	-34.3088	1.727	-19.863	0
C(State)[T.MT]	-73.3897	1.784	-41.132	0
C(State)[T.NC]	-30.5965	1.615	-18.946	0
C(State)[T.ND]	-45.3742	1.784	-25.429	0
C(State)[T.NE]	-33.6294	1.702	-19.762	0
C(State)[T.NH]	-35.2685	2.242	-15.73	0
C(State)[T.NJ]	-3.2433	1.789	-1.813	0.07
C(State)[T.OH]	-35.1388	1.616	-21.749	0
C(State)[T.OK]	-70.7722	1.761	-40.186	0
C(State)[T.PA]	-77.5729	1.647	-47.086	0

	coef	std err	t	P> t
C(State)[T.SC]	-34.8191	1.685	-20.663	0
C(State)[T.SD]	-46.4702	1.733	-26.818	0
C(State)[T.TN]	-67.0819	1.724	-38.904	0
C(State)[T.TX]	-42.1135	1.643	-25.633	0
C(State)[T.UT]	-74.4249	1.84	-40.457	0
C(State)[T.VA]	-41.4292	1.641	-25.251	0
C(State)[T.WI]	-24.9885	1.496	-16.707	0
C(State)[T.WV]	-66.9652	1.962	-34.137	0
C(State)[T.WY]	17.9853	1.682	10.696	0

Omnibus:	12134.993	Durbin-Watson:	0.575
Prob(Omnibus):	0	Jarque-Bera (JB):	29738.633
Skew:	0.738	Prob(JB):	0
Kurtosis:	5.301	Cond. No.	4.16E+04

**Table 1. Regression results using Projected Index Rate, metal tier, network type and state to predict premiums**

Projected Member Months as a measure of 2015 on-exchange market share

Quantifying an issuer’s market share would be easy if marketplace enrollment data for each issuer were available. Since the closest data set published by the CMS is aggregated across all issuers in each state, an innovative measure of market share must be used [12].

The first decision we made is that market share should be a reflection of the number of enrollees for each issuer, rather than total premiums collected. Since this paper is interested in the effect of market share on premiums, it follows that our measure of market share should not be commingled with premiums.

The second decision was to measure the issuers’ market share only on the federally facilitated or state-partnership marketplaces. Since our measure of premiums for each issuer is based entirely on their on-exchange products, the market share measure should also be the on-exchange market share to be consistent.

The last requirement for market share measure is that it has to be current as of 2015. Our measure of premium changes correspond to changes from 2014 to 2015 (the only two years with federal marketplaces in existence). During this period, many issuers merged, and many new issuers appeared as a result of various government programs promoting competition, such as the CO-OP programs. Any market share datasets before 2014, such as the authoritative National Association of Insurance Commissioners [14] and Kaiser Foundation

data [15], are obsolete because their data does not correspond to issuers' market share on federal marketplaces.

Given these requirements, we turned to the 2015 URR PUF for the most recent enrollment numbers.

The first possible choice of a market share measure is the "Experience Period Member Months", which corresponds to the number of enrollees for an issuer in a state in 2013 multiplied by the number of months each enrollee is insured. Unfortunately, many issuers omitted data in this field by citing reasons such as unrepresentative data. The experience period data also do not correspond to the issuers' first year experience on the federal exchanges.

As a compromise, our chosen measure of market share is the "Projected Member Months" in the 2015 URR. To confirm the accuracy of our market share measure, we compared the data with the most recently published Kaiser Foundation database of issuers' market share in 2013 [14]. Table 2 shows each state's top issuer back in 2013 and their 2015 calculated state market share using Projected Member Months in all 34 states with federally facilitated or state-partnership marketplaces.

State	Largest issuer in 2013 - Kaiser	2013 Market Share - Kaiser	2015 Market Share - Calculated
AL	BCBS OF AL GRP	91	96
AK	PREMERA BLUE CROSS GRP	62	24
AZ	BCBS OF AZ INC	50	44
AR	ARKANSAS BCBS GRP	78	73
DE	HIGHMARK GRP	53	82
FL	GUIDEWELL MUT HOLDING GRP	47	24
GA	WELLPOINT INC GRP	36	28
IA	WELLMARK INC GRP	84	Not Found
IL	HCSC GRP	68	71
IN	WELLPOINT INC GRP	59	56
KS	BCBS OF KS GRP	39	28
LA	LOUISIANA HLTH SERV GRP	73	48
ME	WELLPOINT INC GRP	55	35
MI	BCBS OF MI GRP	53	36
MS	MISSISSIPPI INS GRP	60	Not Found
MO	WELLPOINT INC GRP	34	38
MT	ASSURANT INC GRP	36	49
NE	BCBS OF NE	71	89
NH	WELLPOINT INC GRP	83	57

State	Largest issuer in 2013 - Kaiser	2013 Market Share - Kaiser	2015 Market Share - Calculated
NJ	BCBS OF NJ GRP	77	63
NC	BCBS OF NC GRP	86	88
ND	NORIDIAN MUT INS CO	80	83
OH	MEDICAL MUT OF OH GRP	35	30
OK	HCSC GRP	64	83
PA	HIGHMARK GRP	34	32
SC	BCBS OF SC GRP	59	43
SD	WELLMARK INC GRP	74	Not Found
TN	BCBS OF TN GRP	42	92
TX	HCSC GRP	59	69
UT	IHC INC GRP	40	46
VA	WELLPOINT INC GRP	74	61
WV	HIGHMARK GRP	62	100
WI	WISCONSIN PHYSICIANS SERV INS GRP	23	8
WY	BCBS OF WY	38	42

**Table 2. Top issuer by state according to Kaiser [15] and their market share (%) calculated with Projected Member Months. Highlighted entries are states where the issuer is no longer the largest in the 2015 marketplace.**

For 26 out of the 34 states, the largest issuer is consistent between the 2013 Kaiser database and our calculated measure. There may be some discrepancy in the market share percentage since our calculated market share only corresponds to market share in the federal marketplace, whereas the Kaiser market share was calculated from the life-years of those enrolled in major medical and mini-med plans. There are 8 states (highlighted in Table 2) where the largest issuers do not line up. In these cases the states' largest issuers in 2013 chose not to participate in the federal exchange. For example, in South Dakota and Iowa, Wellmark Inc. decided not to participate in the 2014 and 2015 enrollment cycle [16, 17].

State	Largest Issuer	State Market Share (%)	Second Largest Issuer	State Market Share (%)	Third Largest Issuer	State Market Share (%)
AK	Moda Health Plan, Inc.	76	Premiera Blue Shield Blue Cross	24		
AL	Blue Cross and Blue Shield of Alabama	96	Humana Insurance Company	3	UnitedHealthcare of Alabama	1
AR	USable Mutual Insurance Company	73	Celtic Insurance Company	18	QCA Health Plan, Inc.	5
AZ	Blue Cross Blue	44	Health Net of	14	Health Net Life	11

State	Largest Issuer	State Market Share (%)	Second Largest Issuer	State Market Share (%)	Third Largest Issuer	State Market Share (%)
	Shield of Arizona		Arizona		Insurance Company	
DE	Highmark BCBSD, Inc.	82	Aetna Life Insurance Company	9	Aetna Health Inc.	9
FL	Blue Cross Blue Shield of Florida	24	Coventry Health Care of Florida, Inc.	19	Humana Medical Plan, Inc.	17
GA	Humana Employers Health Plan of Georgia, Inc.	49	Blue Cross Blue Shield Healthcare Plan of Georgia, Inc.	28	Coventry Health Care of Georgia, Inc.	10
IA	CHC IA	99	Gundersen Health Plan, Inc.	1	Avera Health Plans, Inc.	0
IL	Blue Cross Blue Shield of Illinois	71	Land of Lincoln Mutual Health Insurance Company	12	Health Alliance Medical Plans	7
IN	Anthem Insurance Companies, Inc.	56	MDwise Marketplace, Inc.	14	Time Insurance Company	9
KS	Coventry Health and Life	48	Blue Cross and Blue Shield of Kansas, Inc.	28	Coventry Health Care Of Kansas Inc	12
LA	Louisiana Health Service & Indemnity Company	48	HMO Louisiana, Inc.	25	Vantage Health Plan, Inc.	10
ME	Maine Community Health Options	61	Anthem Health Plans of Maine, Inc.	35	Harvard Pilgrim Health Care	4
MI	Blue Cross Blue Shield of Michigan	36	Blue Care Network of Michigan	36	Humana Medical Plan of Michigan, Inc	9
MO	Healthy Alliance Life Insurance Company	38	CHL	21	CHL MO	19
MS	Humana Insurance Company	52	Magnolia Health Plan	37	United Healthcare of Mississippi	11
MT	Blue Cross Blue Shield of Montana	49	Montana Health Cooperative	30	Time Insurance Company	12
NC	Blue Cross Blue Shield of NC	88	Coventry Health Care of the Carolinas, Inc.	8	UnitedHealthcare of North Carolina, Inc.	4
ND	Blue Cross Blue	83	Medica Health	15	Sanford Health	3

State	Largest Issuer	State Market Share (%)	Second Largest Issuer	State Market Share (%)	Third Largest Issuer	State Market Share (%)
	Shield of North Dakota		Plans		Plan	
NE	Blue Cross and Blue Shield of Nebraska	89	Time Insurance Company	7	CHC NE	4
NH	Matthew Thornton Health Plan, Inc.	57	Minuteman Health, Inc.	19	Maine Community Health Options	10
NJ	Horizon Blue Cross Blue Shield of New Jersey	63	AmeriHealth Ins Company of New Jersey	16	AmeriHealth HMO, Inc.	16
OH	Medical Health Insuring Corp of Ohio	30	CareSource Ohio Co	19	Community Insurance Company	18
OK	Blue Cross Blue Shield of Oklahoma	83	CommunityCare HMO, Inc.	10	Time Insurance Company	4
PA	Highmark	32	Keystone Health Plan East, Inc.	15	Independence Blue Cross (QCC Ins. Co.)	15
SC	BlueCross BlueShield of South Carolina	43	Consumers' Choice Health Plan	29	BlueChoice HealthPlan of South Carolina, Inc.	15
SD	South Dakota State Medical Holding Company, Inc.	49	Sanford Health Plan of South Dakota	29	Avera Health Plans, Inc.	22
TN	BCBST	92	Humana Insurance Company	4	Time Insurance Company	2
TX	Blue Cross Blue Shield of Texas	69	Humana Health Plan of Texas	9	Cigna Health and Life Insurance Company	6
UT	SelectHealth	46	Arches Mutual Insurance Company	22	Altius Health Plans Inc.	10
VA	HealthKeepers, Inc.	61	BlueChoice, Inc.	9	Coventry Health Care of Virginia, Inc	6
WI	Security Health Plan	17	Compcare Health Services Insurance Corporation	16	Common Ground Healthcare Cooperative	15
WV	Highmark BCBSWV, Inc.	100				
WY	WINhealth	58	Blue Cross Blue	42		

State	Largest Issuer	State Market Share (%)	Second Largest Issuer	State Market Share (%)	Third Largest Issuer	State Market Share (%)
	Partners Inc		Shield Wyoming			

**Table 3. Top 3 issuers by state and their market share (%) calculated using Member Months projected for 2015. Authors’ calculation from 2015 URR data set.**

Using Projected Member Months as a measure of market share is advantageous as the data comes from the same information source used in premium change calculation and is much more fine-grained and recent than data from other commercial databases.

We calculated the market share of each issuer within each state by simply dividing Projected Member Months by the total Projected Member Months for all issuers with the same state. Hereafter, the term “market share of an issuer” will refer to this calculation.

#### Data Wrangling Steps (for reproducibility)

The following steps were taken to preprocess and analyze the 2014 and 2015 URR and the 2015 QHP Medical Landscape file:

1. Retain only plans in the 2015 URR if they are found in the QHP Medical Landscape data. Since each plan (corresponding to a row) is uniquely identified by its “Plan ID (Standard Component ID)”, a fourteen-character alphanumeric identifier in the Health Insurance Oversight System (HIOS), only URR plans with “Plan ID (Standard Component ID)” present in the QHP Medical Landscape file are retained. This ensures that terminated plans and other non-exchange, non-individual plans in the URR are not included in our analysis. There are 4,266 plans from 228 issuers retained, accounting for 99.9% of all individual on-exchange plans. Figure 1 shows the number of issuers in each state. Larger states such as Texas and Florida tend to have more issuers, whereas small states such as West Virginia have few if not just one issuer.

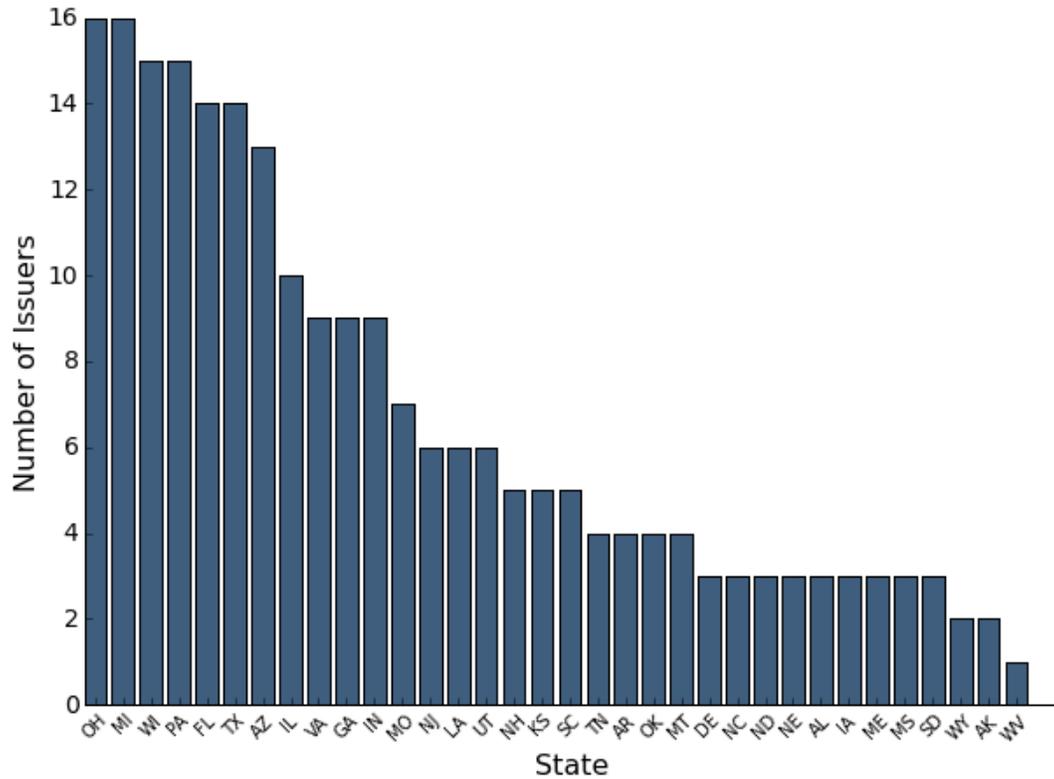
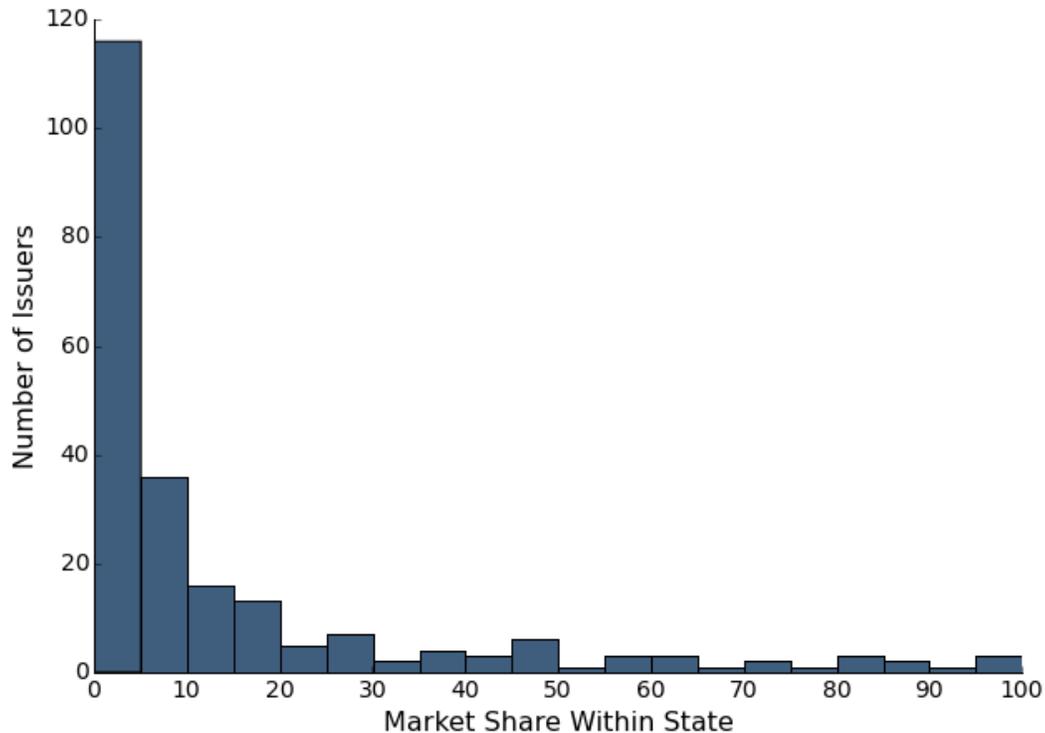


Figure 1. Number of issuers in each state

2. For each state, calculate the state market share for each issuer by dividing the issuer's Projected Member Months by the total Projected Member Months across all issuers in the state. Figure 2 shows the frequency distribution of issuer market shares across all states. Most issuers have less than 10% market share; only a few firms dominate their state markets. This was characteristic of the health insurance industry even before the establishment of the federal exchanges.



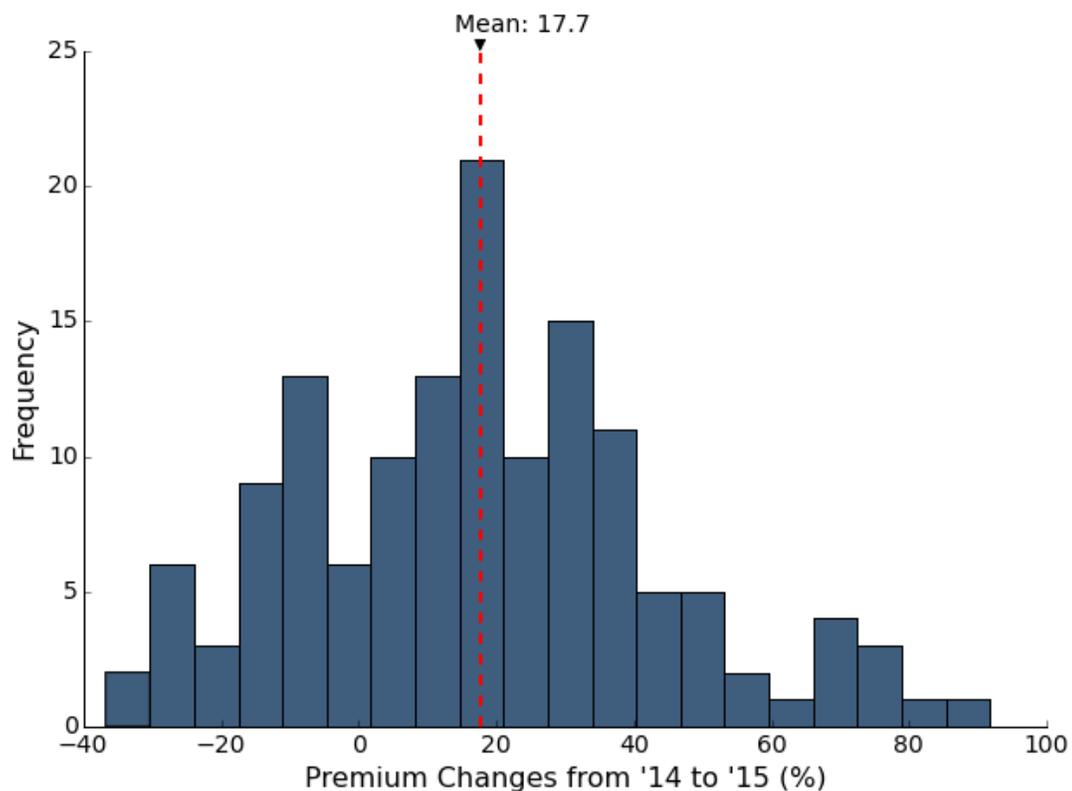
**Figure 2. Frequency distribution of issuer market share**

3. Calculate each issuer’s market share ranking, with 1 corresponding to the largest issuer within a state. The intrastate ranking is more interesting, as it provides an indication of relative market share and potentially the relative pricing power of issuers within a state. Because the insurance market is more fragmented in some states than in others, the absolute market share may be misleading in determining the market dominance of issuers. For instance, in Wyoming, Blue Cross Blue Shield Wyoming is not the dominant issuer even with a 42% market share, whereas in Pennsylvania, a 32% market share is enough to make Highmark the dominant issuer.
4. Calculate change in “Index Rate for Projection Period” from 2014 to 2015 for issuers with data in both 2014 and 2015 URR files. Since issuers are uniquely identified by their “HIOS Issuer ID”, only rows with the issuer ids found in both files are retained. As a final check to eliminate terminated plans and non-individual, non-exchange plans, only plans with “Plan ID (Standard Component ID)” present in the QHP Medical Landscape data are retained. The resulting data is a subset of plans and issuers who were on the exchanges since 2014. Notice that for market share calculation, we use only 2015 data as we are interested in the issuer current market share. However, to calculate rate change we require both 2014 and 2015 data. Within each state, the premium change for each issuer is calculated by:

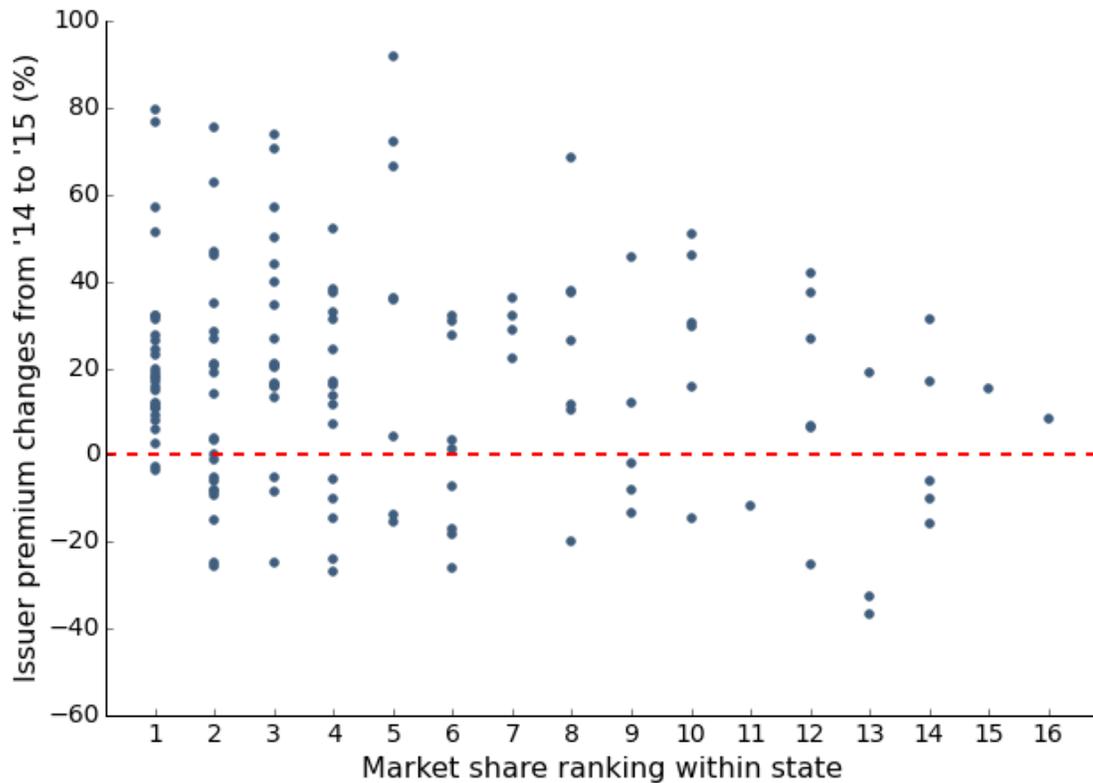
*Issuer premium change from 2014 to 2015*

$$= \left( \frac{\text{Index Rate for Projected Period 2015}}{\text{Index Rate for Projected Period 2014}} - 1 \right) \times 100\%$$

5. There is premium change data for 141 issuers (down from 228 issuers for market share data) across 34 states. This means that 87 issuers recently joined the exchanges, so that their pricing data is absent from the 2014 URR. From Figure 3, the average premium change from 2014 to 2015 (not market share weighted) is an increase of 17.7%, and the distribution of premium change is symmetrically distributed around the mean. Figure 4 shows a scatterplot of the premium change against the state market share ranking of each issuer. Almost all of the largest issuers in each state (those with a ranking of 1) raised rates, whereas a number of smaller issuers (ranking above 10) decreased rates.



**Figure 3. Histogram showing distribution of premium changes from 2014 to 2015 across all states**



**Figure 4. Premium changes against state market share ranking for each issuer. Rank 1 is the largest issuer in the corresponding state.**

## Results

The largest issuer in each state raised premiums on average 75% higher than other same-state issuers. On average, the largest issuers raised rates by 23.94%, while the other issuers only raised rates by 13.68%. This result is statistically significant with a one-tailed paired t-test.

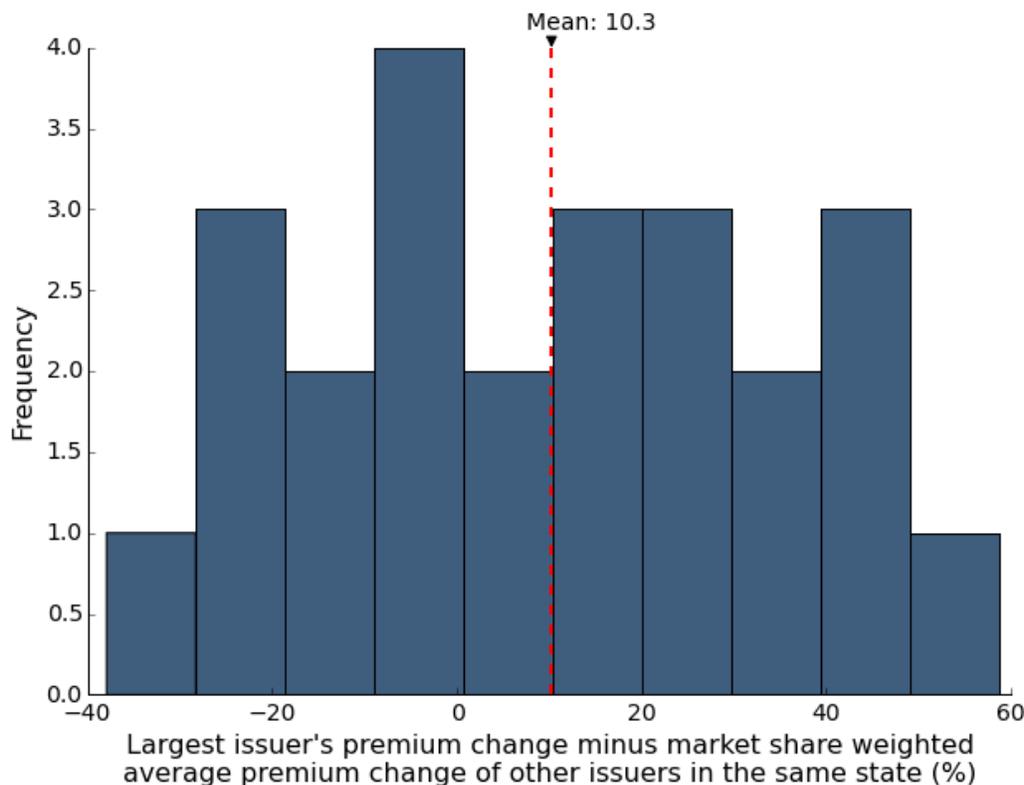
To analyze the impact of market share on premium increases, the premium change of the largest issuer (ranking 1) in each state is compared against the average premium change (weighted by market share) of the rest of the issuers (ranking 2 and above) in the same state. It is essential to compare only issuers within the same state to ensure that state-dependent factors, such as health care cost variations, will not interfere with the analysis. In statistical parlance, we conducted a one-tailed paired t-test with null hypothesis defined below that states the mean difference between the premium change from the largest issuers in each state and from the smaller issuers in each state is less than 0

$$H_0: \overline{\Delta_{Largest\ issuer\ in\ state_i} - \Delta_{Other\ issuers\ in\ state_i}} < 0 \quad \forall \quad i \in \{34\ states\}$$

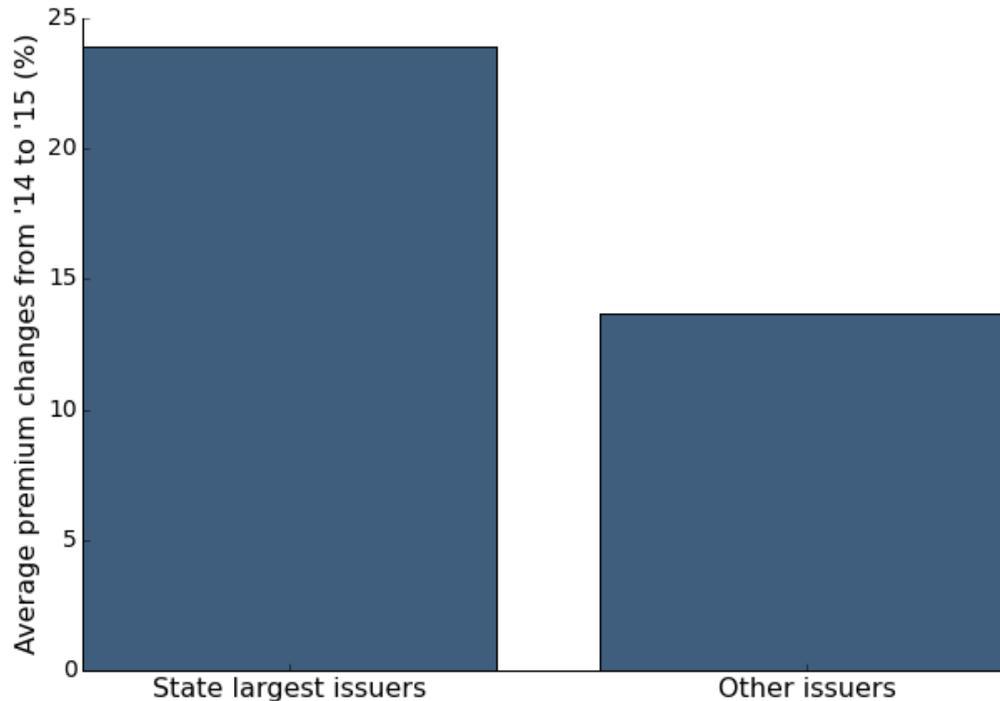
where  $\Delta_{Largest\ issuer}$  represents the premium change of the largest issuer and  $\Delta_{Other\ issuers}$  represents the average premium change of all other issuers in the same state weighted by market share. For states where the largest issuer in 2015 was not present on the exchange in 2014, the data for the state is omitted. There are 10 such states, so that the final test statistic was calculated from 24 states. Figure 5 shows a distribution of

$$\Delta_{Largest\ issuer\ in\ state_i} - \Delta_{Other\ issuers\ in\ state_i}$$

with mean 10.3 percentage points, suggesting that on average, the rate increase by the largest issuer in each state was 10.3 percentage points higher than that of other issuers in the same state. Since the t-statistic is 1.9704 and the corresponding p-value is 0.03047, we reject the  $H_0$  as not true and conclude at 5% significance level that the largest issuers in each state raised premiums more than or as much as other issuers in the same state. The assumptions of t-test are largely valid, since the distribution is approximately normal (the Shapiro-Wilk test fails to reject the null hypothesis of normality) and the premium changes made by issuers are largely independent (most issuers submit their rates around the same time in the last week before the deadline). Figure 6 shows the average premium increase for the largest issuers within each state across the country and that for the other issuers. On average, the largest issuers raised rates by 23.94%, while the other issuers only raised rates by 13.68%. This corresponds to a 75% higher premium increase by the largest issuers compared to the other issuers.



**Figure 5. Histogram of the difference in premium changes between a state’s largest issuer and other issuers within the same state. On average, the largest issuer’s premium increases were 10.3 percentage points greater than other same-state issuers.**



**Figure 6. Average premium increase for the largest issuers in their corresponding states across the US vs. the premium increase for the other issuers. On average, the largest issuers raised rates by 23.94%, while the other issuers only raised rates by 13.68%.**

The largest issuer of each state raised premiums on a larger proportion of plans compared to other same-state issuers. This result is also statistically significant with a one-tailed paired t-test.

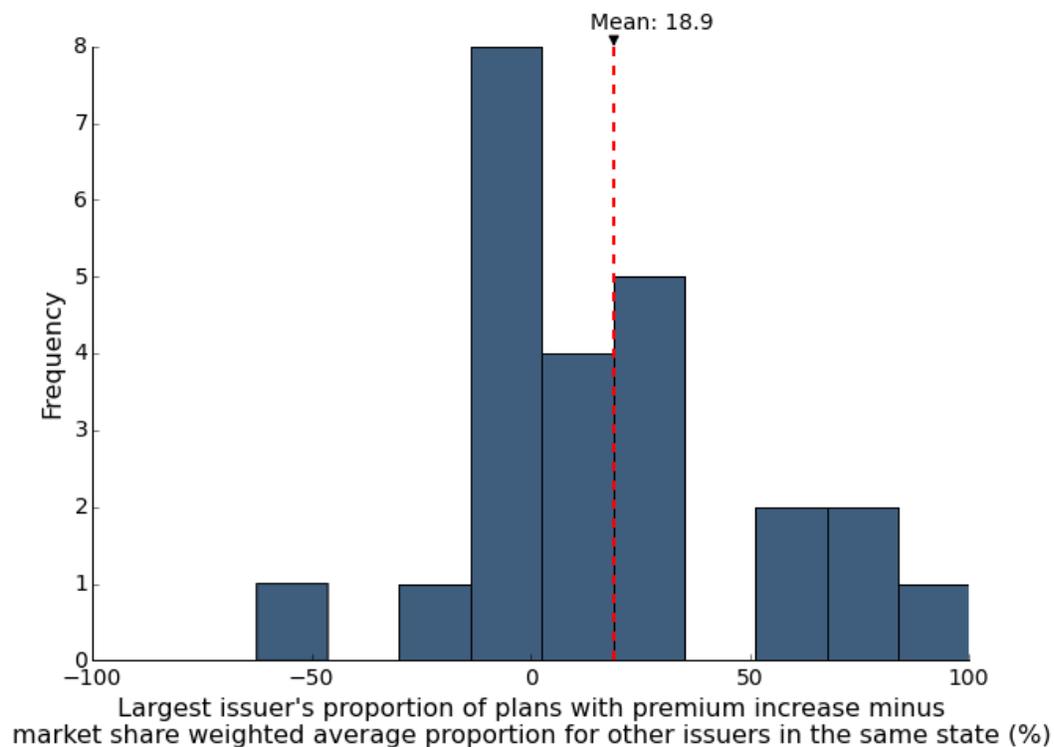
To extend the analysis further, we used the same statistical technique to investigate the distribution of premium increases across plans for the largest issuers and the other issuers. This analysis addresses a common question: whether the premium increases of large issuers are concentrated within a few plans. After all, if only a few plans of the largest issuers experience marked rate increases, the premium increase will not affect as many consumers because they can switch to other cheaper plans provided by the same issuer. To carry out the analysis, the premium change for each plan is calculated using

$$\text{Plan premium from 2014 to 2015} = \left( \frac{\text{Plan Adjusted Index Rate 2015}}{\text{Plan Adjusted Index Rate 2014}} - 1 \right) \times 100\%$$

In the 2015 URR file, the Plan Adjusted Index Rate is found under column DD named “Plan Section 4 - Plan Adjusted Index Rate”, while in the 2014 URR file, the rate is also found under column DD but is named “Plan Section 4 - Average Rate PMPM”. The proportion of plans that have a positive premium change (rate increase) is calculated for each issuer. Denoting this as  $Prop_+$ , the following one-tailed paired t-test is carried out with null hypothesis below that states that the mean proportion of plans that increased their premiums from the largest issuers in each state minus the proportion of plans that increased their premiums from the smaller issuers in each state is less than 0.

$$H_0: \overline{Prop_{+, Largest\ issuer\ in\ state_i} - Prop_{+, Other\ issuers\ in\ state_i}} < 0 \quad \forall \quad i \in \{34\ states\}$$

Again, the proportions of plans with increased premiums for the other issuers were averaged using their market shares as weights. Figure 7 shows the distribution of the difference in proportions for the largest issuer and the other issuers in the same state. The test statistic is 18.9 percentage points, which means that on average, the largest issuer raised rates on a much larger proportion of its plans than other issuers. The t-statistic is 2.584, and the p-value for the one-tailed test is 0.008295. We reject the  $H_0$  and conclude at 5% significance level that the largest issuers in each state not only raise premiums higher, but also raise premiums on more of their plans than other issuers in the same state (here equality is also rejected since the corresponding p value for the two-tailed test is  $0.01659 < 0.05$ ).



**Figure 7. Histogram of the difference between the proportion of plans with rate increases for the largest issuer and the other issuers within the same state. On average, the proportion of**

**plans that the largest issuer raises rates on is 18.9 percentage points higher than other issuers.**

The largest issuers' incurred claims-to-premium ratio is not found to be statistically significantly higher than other same-state issuers.

But can the largest issuers justify their higher premium increases in 2015 by claiming that they had higher incurred claims relative to collected premiums in the experience period compared to other issuers? To test this hypothesis, the following ratio,  $R$ , is calculated using information from the 2015 URR file:

$$R = \frac{\text{Incurred Claims in Experience Period (PMPM)}}{\text{Premiums (net of MLR Rebate) in Experience Period (PMPM)}}$$

Here the experience period refers to 2013. By the time of filing between May and June 2014, issuers only have a few months of claims data for 2014 and they do not qualify as experience period data, since the CMS requires one whole calendar year of data to be present. Note that this is very similar to the Medical Loss Ratio (MLR) as formulated in 45 CFR §158.221, which is used to calculate the MLR rebates issuers have to give to consumers if the MLR falls below 0.80 (i.e. they spent too little on medical expenses) in the experience period. But the MLR calculation would require the denominator to include only premiums collected in the experience period net of taxes, licensing and regulatory fees, which data is unavailable in the URR. To test if the largest issuers in each state have higher incurred claims relative to premiums in the experience period, the following null hypothesis was tested using a paired one-tailed t-test:

$$H_0: \overline{R_{Largest\ issuer\ in\ state_i} - R_{Other\ issuers\ in\ state_i}} < 0 \quad \forall \quad i \in \{34\ states\}$$

Again  $R_{Other\ issuers\ in\ state_i}$  was calculated as a market share weighted average. After omitting states where data on the largest issuer was not available (the largest issuers having only joined the exchange in 2015) and omitting issuers without experience data (issuers can choose not to input experience period claims and premiums data if they deem that the data they have collected is not substantially representative), the test statistic is eventually calculated from 20 data points. Figure 8 shows the distribution

$$R_{Largest\ issuer\ in\ state_i} - R_{Other\ issuers\ in\ state_i}$$

with a mean of 0.02, which means that the largest issuer has a higher claims ratio of only 0.02. Figure 9 shows that the claims-to-premium ratio for the largest issuers is 0.85 while that for the other issuers is 0.83. Since the test statistic is 0.50139 with a one-tailed p value of 0.31092, we conclude at 5% significance level that there is insufficient evidence to reject the null hypothesis in states where this ratio could be calculated. The claims-to-premium ratio of the largest issuer is not statistically significantly higher than other same-state issuers. Even if it

were significant, a 2.5% higher claims-to-premium ratio is unlikely to be sufficient to justify the 75% higher premiums increase that the largest issuer incurred.

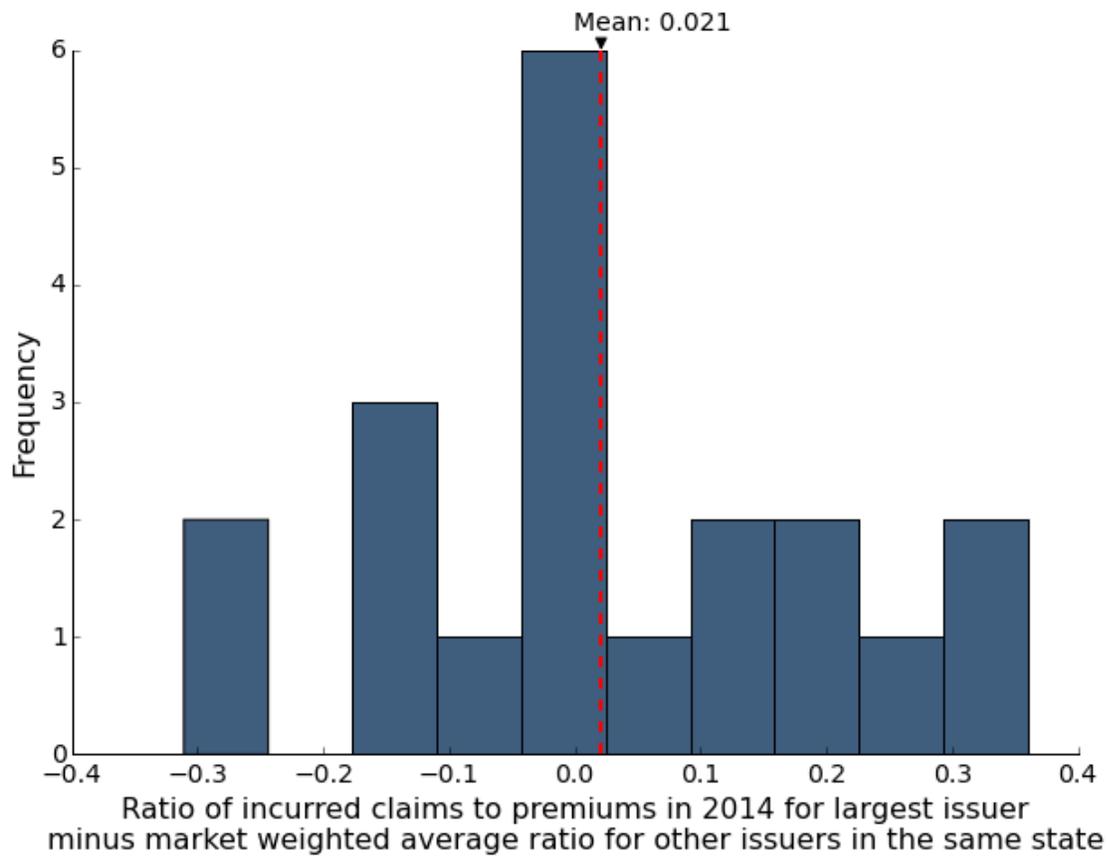
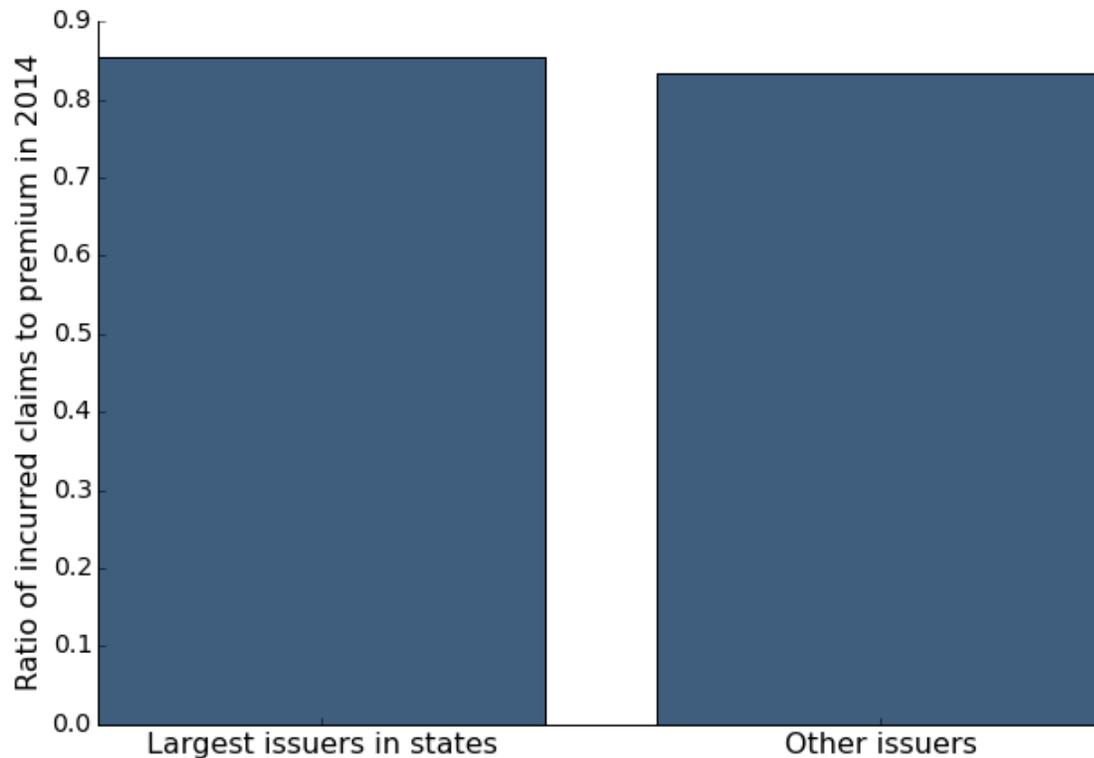


Figure 8. Histogram of the difference between the claims-to-premium ratio for the largest issuer and other issuers from the same state.



**Figure 9. Ratio of incurred claims to premium for the largest issuers in their corresponding states vs. other issuers. On average, the largest issuers have a claims-to-premium ratio of 0.85 while the other issuers have a ratio of 0.83.**

## Discussion

Relative to other same-state issuers, this study finds that the average largest issuer of each state had a 75% higher premium increase from 2014 to 2015 and that their rate increases affects a larger proportion of plans. Yet the largest issuers' higher premium raises do not seem justified from the standpoint of incurred claims-to-premium ratio.

One possible caveat in the study is the lack of actual 2014 claims data in the calculation of incurred claims-to-premium ratio. Because CMS requires the experience period to be a whole calendar year starting from January 1, the experience period data used for pricing 2015 plans corresponds to calendar year 2013, which is prior to the first year issuers offered ACA plans [13]. As such, it may be possible that larger issuers experience much higher medical loss ratio for the first few months of 2014 and have to adjust their premiums higher.

Besides, there may be other possible justifications for the higher premium increase that are not covered within this study's scope. Perhaps the largest issuers in each state expanded their network faster than other issuers, so that premium increases reflect more accessible or higher quality medical care. To validate this claim, data on the size and quality of plan

networks would be required. Future research can also examine the change in enrollee demography for the largest issuer. The higher premium increases may be due to older enrollees for the largest issuer compared to other same-state issuers. Older people may tend to be more conservative in selecting their insurance and choose a larger, more recognized issuer, whereas young, healthy people may be more receptive to smaller, new issuers. These older enrollees may have higher variance in their medical utilization costs and issuers have to raise premiums to compensate for additional risks.

Beyond the results, this paper also contributes two novel measures of premiums and market share. The first is using the Projected Index Rate as a representation of an issuer's premium across all its plans. The second is using the Projected Member Months in determining an issuer's on-exchange market share. Both numbers are available through the URR PUF and are updated for each plan year. There may be some caveats related to these measures. For instance, the Projected Index Rate measures anticipated allowed claims for EHBs (PMPM) and can increase from year to year if a worsening of enrollee demography is anticipated. The most objective measure of premium should correct for enrollee demography, and this should fall under the purview of future research once plan-specific enrollee demographic data is available.

Overall, this study is important in light of recent market consolidation efforts in the health insurance industry. This paper provides evidence that even after ACA, the largest on-exchange issuers may be in a better position to practice anti-competitive pricing compared to their same-state counterparts. This evidence should be prudently considered in any antitrust debate.

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**Editor:** Latanya Sweeney

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## Citation

Wang E, Gee G. Larger Issuers, Larger Premium Increases: Health insurance issuer competition post-ACA. *Technology Science*. 2015081104. August 11, 2015. Version 2. <http://techscience.org/a/2015081104/index2.php>

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## Data

Wang E, Gee G. Replication Data for: Larger Issuers, Larger Premium Increases: Health insurance issuer competition post-ACA. Harvard Dataverse. August 5, 2011. <http://dx.doi.org/10.7910/DVN/GFTHAN>