The Differential Effects of Medical Loss Ratio Regulation on the Individual Health Insurance Market

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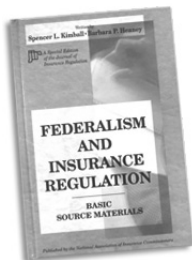
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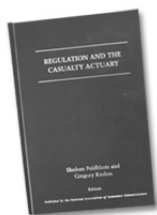
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The Differential Effects of Medical Loss Ratio Regulation on the Individual Health Insurance Market

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Abstract

The federal Affordable Care Act (ACA) imposed many new regulations on the health insurance marketplace, including a minimum medical loss ratio (MLR) requirement. However, several states had minimum MLR regulations in place prior to the enactment of the ACA. In this paper, we examine whether insurers operating in states with pre-ACA MLR regulations were better able to adapt to the new MLR requirements imposed by the ACA. We find evidence that state MLR requirements have adversely affected insurer market share. We also find that insurers operating in states without existing MLR requirements experienced decreases in market share relative to insurers operating in states with MLR requirements. Finally, there is evidence of a differential effect of the state and federal MLR requirements based on the extent of market share, with smaller insurers being more adversely affected.

Introduction

Providing affordable health insurance coverage to all citizens is a challenge faced by many countries. In the U.S., the passage of the ACA was designed to increase the availability and affordability of health insurance to Americans. The ACA contains 10 legislative titles and spans nearly 1,000 pages. While it is lengthy and contains a number of provisions, one provision that became effective soon after the passage of the ACA is the MLR requirement. The law currently requires that health insurers either spend at least 80% of premiums collected for individual and small group health insurance on medical claims and quality improvement or rebate the difference to its policyholders. For large group plans, the MLR requirement is 85%. Insurers must report MLRs to the Department of Health and Human Services. This provision, designed to encourage insurers to increase spending on quality improvements, reduce administrative costs, and/or help keep premiums down via rebating, became effective Jan. 1, 2011.[1, 2]

A study by Hall and McCue in early 2012 estimated the effect the MLR requirement would have had on insurers if it had been in effect one year earlier. The authors found that close to $2 billion in rebates would have been due in 2010, with 5.3 million consumers in the individual market receiving close to $1 billion. The first year in which the MLR requirement was in effect, enrollees received a little over $1 billion, significantly less than the estimate based on 2010 premiums and costs.[3] The next two years, rebates dropped with slightly more than $500 million in rebates due to approximately 8.5 million enrollees in 2012 and approximately 332 million owed to about 6.8 million enrollees in 2013. However, in 2014, insurers owed close to $470 million in rebates to enrollees.[4] Though the number of total rebates issued has declined since the initial high level in 2011, a substantial amount of premium dollars are still rebated annually.[5, 6]

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1. The MLR requirement applies to all but self-insured plans. However, it did not apply to nonprofit insurers until 2014.

2. 17 states applied for an adjustment to the MLR requirement. Of these, seven states received approval to utilize a lower MLR requirement for some period of time. These states are Georgia, Iowa, Kentucky, Maine, Nevada, New Hampshire and North Carolina.

3. This may be the result of insurers making internal adjustments in response to the law, as suggested by prior research. A study by Turnbull and Kane (1999) suggests that insurers may alter accounting and actuarial practices in response to the regulation of MLRs. If this type of manipulation occurs, it could potentially negate some of the benefits of regulating MLRs. Harrington (2013) finds that MLR regulation could have several adverse consequences, including higher costs and barriers to entry, and this ultimately lead to increased market concentration.

4. This information was obtained from the federal Centers for Medicare & Medicaid Services (CMS) website. See *https://www.cms.gov/CCIIO/Resources/Data-Resources/mlr.html* for more detailed information, including a breakdown of rebates by state and by insurer during this period.

5. Information obtained from reports provided by the CMS is available on their website at *https://www.cms.gov/CCIIO/Resources/Data-Resources/mlr.html*.

6. Without constraints, this provision might lead insurers to alter underwriting standards in an effort to change the 'quality' of the business insured. However, two other provisions of the ACA restrict insurers' abilities to do so. First, companies selling individual health insurance can no

Prior to the passage of the ACA, some states already regulated MLRs. Existing state MLR requirements applied to the individual market; the group market; or, in some states, both. State MLR requirements ranged from a low of 50% to a high of 85%. In some cases, they were conditional on whether it was a newly issued policy or a renewal, the specific type of policy, and/or the cost of coverage (America's Health Insurance Plans, 2010).[7]

Though the ACA has been in effect for several years, some recent government actions may result in some changes to the existing system.[8] Most relevant to the current study is a recent Notice Rule by the Centers for Medicare & Medicaid Services (CMS). The Rule indicates that a state will be allowed to change the MLR requirements for insurers beginning in 2019 if it can demonstrate that this change will benefit the insurance market. The Rule, issued on April 9, 2018, specifically "allows states to request reasonable adjustments to the MLR standard for the individual market if the state shows a lower MLR standard could help stabilize its individual insurance market."[9] States that reduce the MLR requirement may be more attractive to insurers than states with higher requirements, providing consumers in these states with more options and possibly better prices.

In the current study, we consider the potential effect of the MLR requirement on the extent to which health insurers operate in the individual health insurance markets post-ACA. To the extent that health insurers are able to adapt by making internal adjustments as suggested by prior literature (Turnbull and Kane, 1999), such as modifications to accounting and actuarial practices, the provision may not affect the business of health insurers, and it could serve to increase the number of insurers operating in the marketplace. Alternatively, to the extent that the MLR requirement leads to increased regulatory costs and decreased profit margins, insurers may reduce business activity in particular markets or exit some markets

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longer deny applicants with preexisting conditions. Second, rating factors for most individual and group plans are now limited to age, tobacco use, family size and geographic location. It should be noted that some of the ACA provisions do not apply to grandfathered and grandmothered plans. For specific details on the final rules as they relate to rating factors, see *https://www.cms.gov/ CCIIO/Resources/Files/Downloads/market-rules-technical-summary-2-27-2013.pdf*.

7. See America's Health Insurance Plans (April, 2010) available online at *www.naic.org/ documents/committees_e_hrsi_comdoc_ahip_chart_mlr.pdf* for information on states with conditional MLR requirements.

8. Though not related to the MLR, a 2017 executive order could significantly affect health insurance exchanges. This order reduced funds previously allocated for advertising, reduced the time period in which individuals had to elect coverage on exchanges, and immediately stopped reimbursements to insurers for providing lower deductibles and out-of-pocket costs to low income individuals. In addition, a provision in the Tax Cuts and Jobs Act of 2017 (TCJA) removed the penalty for individuals that do not maintain health insurance coverage. Collectively, these changes may reduce the demand for coverage by consumers and/or the willingness of insurers to operate on exchanges, which could lead to reduced options for consumers buying coverage on exchanges and possibly higher cost individual health insurance coverage.

9. Additionally, the Rule increases the maximum allowable rate increase with rate review from 10% to 15% and provides states with options in terms of determining essential health insurance benefits. See *https://www.cms.gov/Newsroom/MediaReleaseDatabase/Press-releases/ 2018-Press-releases-items/2018-04-09.html* to review the full notice.

completely.[10] We also consider whether the effect of the MLR requirement imposed by the ACA varies for insurers operating in states with existing MLR requirements compared to those operating in states without such requirements. Understanding the effect of the ACA's MLR requirement on insurers and the health insurance marketplace overall has become increasingly important in light of the recent Rule allowing states to change MLR requirements beginning in 2019. This is an important issue to consider as how health insurers respond to MLR requirements could adversely affect consumers by increasing the cost of coverage and/or reducing consumer choices.

Literature Review

There is a large body of literature on the effect of legislation on health insurance markets in the U.S. with a growing number of studies focusing on the ACA in particular.[11] However, few studies focus specifically on the MLR requirement. In this section, we review some of the most relevant health insurance reform literature.

A number of countries have passed legislation for the purpose of improving the availability and affordability of health insurance coverage. This has led to research regarding the effectiveness of these strategies. Early studies involving the Health Insurance Act of 2006, a Dutch health reform measure, found that both health insurance losses and premiums increased in the two years following the implementation of the health insurance reform measures (Rosenau and Lako, 2008). Later studies find that, while the Health Insurance Act has been effective in reducing the percentage of the population that is uninsured, health care costs have continued to rise (Ginneken, Swartz, and Van der Wees, 2013; Maarse, Jeurissen, and Ruwaard, 2016). However, the growth rate of health care expenditures has slowed (Maarse, Jeurissen, and Ruwaard, 2016). In addition, while 'risk selection' is not allowed, there is a wide variation in premiums which suggests that there is still some selection taking place (Maarse, Jeurissen, and Ruwaard, 2016).

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10. Karaca-Mandic, Abraham, and Simon (2015) find the fact that insurers with more market power have lower MLRs suggests that insurers may respond to the MLR regulations with any number of strategic operational decisions.

11. There is a significant amount of literature on the effect of the regulation of health insurance in other countries. For example, in Australia, three major initiatives were implemented within a three-year period which led to an increase in the number of insured persons. One study considers the issue of whether the penalties imposed for purchasing the coverage later in life, when expected health insurance costs are higher, appropriately addresses the age-based adverse selection. Using a modified Rothschild-Stiglitz model, the study draws several major conclusions from its findings in that older, low risk individuals will not be incentivized to purchase insurance and that it is not likely that the provision will lead to full insurance coverage (Brown and Connelly, 2005). A later study uses regression-discontinuity in an attempt to isolate the effect of the requirement to purchase coverage provision on the size of the uninsured population. The authors find that 22–32% of the increase in the number of insureds resulted from the requirement to purchase hospital coverage (Palangkaraya and Yong, 2007).

As it relates to the most recent health insurance reform, a number of reports and academic studies focus on the potential effect of the ACA, or specific provisions thereof, on a variety of factors including the uninsured population and the health insurance market. The findings, as they relate to the MLR requirement, are mixed. McCue, Hall, and Liu (2013) examine the MLRs, administrative cost ratios, and operating margins for health insurers operating in the individual market, and they find some positive effects. Specifically, for-profit insurers experienced increased MLRs as well as decreased administrative cost ratios and operating margins from 2010 to 2011. For the group insurance market, the authors find lower administrative cost ratios for both small group and large group markets, but only lower operating margins are found for the large group market. Both in the individual and group markets, there appear to be differences between nonprofit and for-profit insurers. McCue and Hall (2015) find similar results between 2011 and 2012 for the individual market. The study also finds that MLRs increased and administrative cost ratios decreased for both the small group and large group markets. Additionally, profit margin increased for the small group, while there were no significant differences in profit margin for the larger market. However, the study only finds these results for for-profit insurers.

Alternatively, Day, Himmelstein, Broder, and Woolhandler (2015) find that the MLR requirement created by the ACA has very little effect on insurer overhead spending, given the components of the formula used in calculating the MLR. These components include quality improvements and certain other costs as part of medical payments (the numerator); and they exclude some taxes, regulatory fees, and other spending from income (the denominator). The authors reach this conclusion after examining the MLRs of health insurers before and after the implementation of the MLR requirement, and they find no significant changes.

The differences in the findings of studies examining the effect of the MLR requirement may be due to the samples utilized. Day, Himmelstein, Broder, and Woolhandler (2015) use only health insurers listed on the Fortune 500. This results in a sample size of only nine health insurers, all of which are large firms. Alternatively, the other studies start with data obtained from the NAIC. This results in a larger sample size and includes nearly all insurers operating in the health insurance marketplace.[12]

Though there have been some studies which focus on the effect of the MLR requirement on insurers, as discussed above, the results have been mixed, and prior research utilizes univariate analysis only. As such, they do not control for other factors that may affect changes in the financial performance of health insurers. In addition, as noted in Harrington (2013), there may be some unintended consequences of the MLR requirement including barriers to entry for new insurers and increased market concentration as insurers work to meet the MLR requirement or possibly achieve economies of scale. In the current study, we utilize difference-

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12. The authors apply some screens to the initial data set for conducting their analysis, so the study does not include every insurer operating in the health insurance marketplace. However, the screens applied are commonly utilized in insurance studies.

in-difference methodology to determine the effect of the MLR requirement on insurers, controlling for other factors that could affect insurer market share. In addition, we are able to determine if the effect of the ACA's MLR requirement varies in the presence of existing state MLR requirements. This is a substantial addition to existing literature on this particular provision of the ACA.

Data and Methodology

To examine the effect of the implementation of the MLR requirement on the health insurance marketplace, we use the NAIC database. We obtain firm-state level premium information on health insurers by line, as well as firm level financial and organizational data for the period 2001–2014. To ensure that the sample includes active health insurers, we exclude all insurers with nonpositive values for direct premiums earned, losses, assets, and surplus. In this analysis, we focus on insurers operating in the individual market. As such, we also exclude any insurer with nonpositive direct premiums earned for individual health insurance. The final panel dataset consists of 4,573 firm-state-year observations.

In addition to the firm level health insurer information, we identify states with existing individual MLR requirements prior to the passage of the ACA. These states were identified using information obtained from multiple sources. More than half of the states had individual MLR requirements in place prior to 2010.[13]

The passage of the ACA in 2010 allows us to conduct a natural experiment. Utilizing difference-in-difference estimation, we examine the effect of the new legislation (pre- and post-ACA) on insurers operating in states with and without existing MLR requirements (treatment and non-treatment groups).[14] Though some prior research suggests the MLR requirement has had some positive effects, Harrington (2013) suggests there could be several unintended consequences,

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13. Specifically, we use "State Mandatory Medical Loss Ratio (MLR) Requirements for Comprehensive, Major Medical Coverage: Summary of State Laws and Regulations" published in April 2010 by America's Health Insurance Plans to identify states with existing MLR requirements. This information is verified by a search of the state statutes to confirm the existence of the requirement, verify the implementation date of the requirement, and ensure that no substantial changes to the requirement were made during the sample period. The following states identified as having an individual MLR in place during the sample period: Arizona; California; Colorado; Delaware; Florida; Iowa; Kansas; Kentucky; Maine; Maryland; Massachusetts; Michigan; Minnesota; New Jersey; New York; North Carolina; North Dakota; Pennsylvania; South Carolina; South Dakota; Tennessee; Utah; Vermont; Virginia; Washington and West Virginia. Note that California is not included in our analysis due to a lack of available information.

14. Because of the inclusion of the *NoStateMLR* and *Post-ACA* indicators, it is not possible to also include year-fixed effects and state-fixed effects due to collinearity. An alternate version of the model presented in Table 4 is constructed in which these two variables are excluded while year- and state-fixed effects are added. In these models, the interaction variable remains significant and negative which is consistent with the results of the models reported in Table 4. The results on the firm-specific factors are also consistent.

including barriers to entry and increased market concentration. As such, we focus on the effect of the MLR requirement on market share.

For firm *i*, in state *s* during year *t*, we estimate several fixed effect regression models that take the general form of:

$$
\begin{aligned}
Y_{ist} = \ &\alpha_{ist} + NoStateMLR_{ist} + Post-ACA_t \\
&+ NoPriorMLR * Post-ACA_{ist} \qquad 1) \quad + Y_{ist} + Z \\
&+ \varepsilon_{ist}
\end{aligned}
$$

Here, Y is the natural logarithm of market share using either premiums earned or member months. The market share of a given firm is calculated as the premiums earned (member months) for firm *i* in state *s* during year *t*, scaled by total premiums earned (member months) of all insurers operating in state *s* during year *t*.

There are three primary variables of interest. First, *NoStateMLR* is a dummy variable indicating that a given state did not have an MLR requirement in place prior to the ACA. Second, *Post-ACA* is a dummy variable equal to one in the years in which the ACA imposed the MLR requirement (2011–2014). Third is the interaction of the state and ACA indicator variables, called *NoStateMLR*Post-ACA*. To control for the effect of firm-specific factors on market share, we also include a vector of firm characteristics, Y. Finally, Z represents firm indicator variables, and ε is the stochastic error term. Robust standard errors are reported for all models.

The firm-specific characteristics included in the model are: size; capitalization; mutual indicator; group indicator; percent of business in the group market; monostate indicator; age; and nonprofit indicator.[15] Similar to prior studies that consider the effect of regulation on the structure and performance of the insurance marketplace (Weiss and Choi, 2008), we control for size and financial viability. In our model, size is measured as the natural logarithm of assets, while capitalization is measured as surplus divided by assets. We would expect that larger and more capitalized insurers will have a larger market share relative to smaller and less capitalized insurers. Insurance studies also consistently demonstrate the effect of organization form on business decisions (Mayers and Smith, 1988; Lamm-Tennant and Starks, 1993; Karl and Nyce, 2014). As such, we include a mutual indicator, which is equal to one if the insurer is a mutual company and zero otherwise. We have no *a priori* hypothesis related to this variable.

Recognizing the need to control for group affiliation (Weiss and Choi, 2008), we include a group indicator, which is one if the firm is a member of a group and zero otherwise. If the firm is a member of a group, it is possible that the insurer can benefit from the knowledge and expertise of other members of the group. If this is

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15. Some insurance studies also include controls for being publicly traded and distribution type. However, we do not include these variables in the current study due to a lack of variation. Specifically, nearly 96% of the sample are not publicly traded and 85% have the same distribution type. As a robustness test, we run a variation of the model, including these controls for the years 2003–2013. These two variables are not significant, and the results for the other variables included in the model are generally consistent with those reported here. Results are available from the author upon request.

beneficial in managing MLR requirements, we would expect a positive effect on market share.

Since prior research highlights the differences among different health lines of business (Cole, He, and Karl, 2015), we include a variable to control for the percent of business in the group market (measured as premiums earned in group insurance divided by total premiums earned). Since total group direct premiums written are consistently greater than premiums written in the individual market on an annual basis[16], insurers with a greater percentage of business written in the group market may have larger market shares. If this is the case, we expect the group market variable to be positive and significant.

We also include a monostate indicator, which is equal to one if the insurer operates in only one state and zero otherwise. Insurers focused on single states are likely to have larger market shares relative to insurers operating in multiple states. Age is calculated as the national logarithm of years in business. Relative to younger insurers, older and more established insurers may exhibit differences in efficiencies, underwriting expertise, or similar operating characteristics which may have consequences for insurer market share. Finally, the nonprofit indicator, equal to one if the insurer is a nonprofit and zero otherwise, is included as prior research suggests that differences exist between these two groups of insurers.

Results

Summary Information

Before we examine changes in market share, we first consider the trends in the average number of insurers operating in each state. Table 1 reports these trends separately for states with and without existing MLR requirements. As shown in Panel A, there has been a growth in the average number of health insurers operating in both states with and without MLR requirements as well as both pre- and post-ACA. However, the growth is greater in states with no state MLR requirement in comparison to states with MLR requirements. In addition, both pre- and post-ACA, there were more insurers operating in states with MLR requirements compared to those without, expect in the most recent year of the sample.

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16. In 2017, insurers wrote approximately $162 billion in direct premiums in group comprehensive coverage and less than $70 billion in individual comprehensive coverage. While the individual market has seen greater premium growth than the group market, the group market is still substantially larger. See Table 3 of the NAIC/Center for Insurance Policy and Research 2017 Health Insurance Industry Analysis Report for additional details (available online at *https://www.naic.org/documents/topic_insurance_industry_snapshots_2017_health_ins_ind_rep ort.pdf?48*).

Table 1:
Average Number of Insurers Operating in Health Insurance Market
Panel A: Average Number of Insurers in States by Year

	Year	State MLR	No State MLR	Diff.
Pre-ACA	2001	10.2333	5.9565	4.2768
	2002	10.2381	6.1515	4.0866
	2003	11.0149	7.0370	3.9779
	2004	10.3835	7.2564	3.1270
	2005	9.8489	7.1221	2.7268
	2006	9.6939	8.4545	1.2393
	2007	10.2364	8.8810	1.3554
	2008	10.4320	8.8652	1.5668
	2009	10.5843	9.6211	0.9632
	2010	10.1429	10.3900	-0.2471
Post-ACA	2011	11.1778	10.2362	0.9416
	2012	11.7849	10.1168	1.6682
	2013	12.7835	11.0571	1.7264
	2014	13.6991	13.3566	0.3425

Panel B: Average Number of Insurers in States

	Pre-ACA	Post-ACA	Diff.	% Change	Sig.
State MLR	10.2826	12.4427	2.1601	21%	***
No State MLR	8.3347	11.3403	3.0056	27%	***
Difference	1.9479	1.1025			
% Change	23%	10%			
Sig.	***	***			

Source: Authors' analysis of health insurer data from the NAIC for the years 2001–2014.

Panel B of the table shows the average number of insurers operating in each state during the sample period. The growth in the average number of insurers operating in states with MLR requirements post-ACA is 21%, which is approximately 6% less than the growth observed in states without MLR requirements. In addition, the difference in the average number of insurers in states with and without MLR requirements is smaller post-ACA. T-tests of the means indicates that these differences are all statistically significant at the 1% level. This

summary evidence suggests that there was increased competition in the health insurance marketplace post-ACA. Post-ACA, there also appears to be less of a difference in the extent of competition in states with MLR requirements compared to those without MLR requirements.

Figure 1 shows the average market share of insurers operating in the individual market during the sample period. We separately examine insurers operating in states with and without an existing MLR requirement. It is apparent that average market share has declined during the sample period. It is also evident that average market share is consistently larger for insurers operating in states with no existing MLR requirements. This finding is consistent with those reported in Table 1, which indicate that there are fewer insurers operating in states with no MLR requirements in comparison to those with MLR requirements.[17]

Figure 1:
Average Market Share

Mean of Market Share
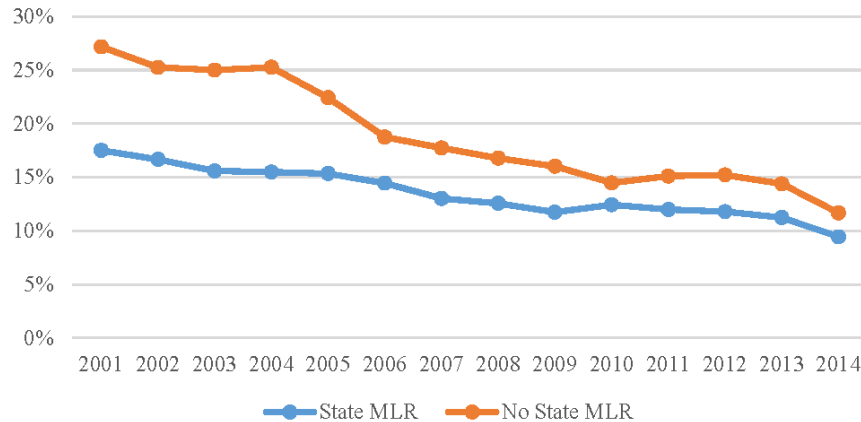
In terms of pre-ACA, as shown in Table 2, the average market share of insurers operating in states with a state MLR requirement is approximately 14% while the average market share of insurers operating in states without a state MLR requirement is nearly 19%. This difference persists post-ACA; however, the magnitude of the difference is smaller. With the exception of states with and without an MLR requirement post-ACA, these differences are all significant at the 1% level.

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17. To determine if the decline in average market share reported in Figure 1 is significant, we construct a basic model which includes the firm-specific variables used in the later models and year-state indicators. The omitted year is 2001. We find that every year variable is significant and negative. Tests of the year coefficients suggest that the decline in market share is generally significant during these time periods: 2002–2003; 2004–2005; 2008–2009 and 2013–2014. Results are available from the authors upon request.

Based on these findings, we would expect the *NoStateMLR* variable to be significant and positive and the *Post-ACA* variable to be insignificant. As a result, the expectation of the combined effect, *NoStateMLR*Post-ACA*, is unknown.

Table 2:
Average Market Share Differences

	Year	State MLR	No State MLR	Diff.
Pre-ACA	2001	17.50%	27.17%	-9.67%
	2002	16.67%	25.25%	-8.59%
	2003	15.67%	23.15%	-7.48%
	2004	15.79%	23.08%	-7.29%
	2005	15.83%	20.61%	-4.78%
	2006	14.97%	17.53%	-2.57%
	2007	13.33%	16.67%	-3.33%
	2008	13.02%	15.73%	-2.71%
	2009	12.36%	14.74%	-2.38%
	2010	12.57%	14.00%	-1.43%
Post-ACA	2011	12.22%	14.07%	-1.85%
	2012	11.83%	14.21%	-2.39%
	2013	11.34%	13.33%	-1.99%
	2014	9.73%	10.85%	-1.12%

Source: Authors' analysis of health insurer data from the NAIC for the years 2001–2014. Notes: Averages are calculated separately for insurers operating in states with an MLR requirement and states without pre-ACA and post-ACA.

Regression Model Results

Summary statistics for variables used in the models are provided in Table 3 (on page 12).[18] The main regression model results are presented in Table 4 (on page 13). The results, presented in the first column, measure market share using premiums earned. In the second column, market share is measured using member months. The results are consistent across both model specifications.

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18. There are two observations in which the percent of group insurance written exceeds one. To ensure that these observations are not affecting the results, the models are run excluding these observations. The results remain consistent with those reported in Table 4.

Table 3:
Summary Statistics

Variable	Mean	Std. Dev.	Min	Max
Dependent Variables				
ln(Market Share - Premiums Earned)	-4.3981	2.9552	-15.1668	0.0000
ln(Market Share - Member Months)	-4.5469	3.1371	-15.6633	0.0000
Independent Variables				
No State MLR	0.5032	0.5000	0.0000	1.0000
Post-ACA	0.3610	0.4803	0.0000	1.0000
No State MLR*Post-ACA	0.1890	0.3916	0.0000	1.0000
Size	12.3575	1.9308	6.2231	16.6964
Capitalization	-0.7265	0.3564	-7.1731	-0.0009
Percent Group Insurance	0.5621	0.3415	0.0000	1.0000
Mutual	0.1225	0.3279	0.0000	1.0000
Group	0.8591	0.3479	0.0000	1.0000
Age	3.1971	0.8352	0.0000	4.6821
Non-Profit Indicator	0.2485	0.4322	0.0000	1.0000
Total States	4.4712	8.8602	1.0000	36.0000

Source: Authors' analysis of health insurer data from the NAIC, America's Health Insurance Plans (AHIP), and state statutes for the years 2001–2014.

As expected, the *NoStateMLR* variable is significant and positive. This result indicates that the market share of the average insurer is lower in states with MLR requirements, suggesting that the existence of state MLR requirements have adversely affected insurers operating in these states as it relates to market share. Also as expected, the *Post-ACA* variable is not statistically significant. However, the interaction of *NoStateMLR* and *Post-ACA* is significant and negative. This result suggests that post-ACA, market shares declined for insurers operating in states with no MLR requirement. In other words, insurers operating in states with no existing state MLR were adversely affected by the MLR requirement imposed by the ACA.

In addition to the variables of interest, several of the control variables are significant. Specifically, we find that larger insurers and insurers that only operate in a single state have larger market shares, suggesting that large specialized insurers have found success in the individual marketplace. In addition, the results suggest that insurers that more capitalized, established insurers, and nonprofit insurers tend to have lower market shares.[19]

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19. Both age and the mutual indicator are significantly correlated with size at a level above .5. As such, the age and mutual variables are removed from the models. In the reduced model, the results on the remaining variables are unchanged.

Table 4:
Model Results

	Premiums Earned	Member Months
NoStateMLR	0.8900***	0.8558***
	[0.104]	[0.107]
Post-ACA	-0.0705	-0.0578
	[0.090]	[0.093]
NoStateMLR*Post-ACA	-0.3961***	-0.3634***
	[0.111]	[0.114]
Size	0.7197***	0.8191***
	[0.079]	[0.081]
Capitalization	-0.6743***	-0.7584***
	[0.107]	[0.110]
Mutual	-0.4942	-0.6181
	[0.517]	[0.532]
Group	0.1766	0.2087
	[0.187]	[0.193]
Percent Group Insurance	-0.0252	0.1379
	[0.126]	[0.130]
Monostate	0.8405***	0.8171***
	[0.193]	[0.198]
Age	-0.7177***	-0.9829***
	[0.148]	[0.152]
NonProfit Indicator	-0.8157*	-0.8232*
	[0.464]	[0.477]
Constant	-12.2761***	-12.9470***
	[0.989]	[1.018]
Observations	4,573	4,573
R-squared	0.7324	0.7482

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
Company-fixed effects included
Source: Authors' analysis of health insurer data from the NAIC, AHIP and state statutes for the years 2001–2014. Notes: Analyses control for firm-specific effects. Clustered standard errors used. All continuous variables are transformed using natural logarithm.

Additional Analyses

While a number of insurers operated in multiple states during the sample period, the majority operated in only one state. Specifically, 464 of the insurers, nearly 93%, fall into this category. To test the robustness of the results, we construct several variations of the models presented in Table 4. First, we include a variable that represents the total number of states in which the insurer operates instead of the monostate indicator. Next, we exclude insurers that operate in large number of states, defined as more than three. Finally, we exclude insurers that operate in multiple states. As such, the final set of models only includes insurers that operate in either a state with an MLR requirement or a state without an MLR requirement. Results for these three model variations are presented in Table 5.

Table 5:
Alternate Controls for Extent of Activity in States

	Include Total States Variable		3 or Fewer States		MonoState Insurers	
	Premiums Earned	Member Months	Premiums Earned	Member Months	Premiums Earned	Member Months
NoStateMLR	0.8883***	0.8557***	1.0013***	1.1281***	-0.3644	-0.8745
	[0.104]	[0.107]	[0.125]	[0.134]	[1.278]	[1.377]
Post-ACA	-0.0686	-0.0658	-0.1932**	-0.1571*	-0.0711	-0.0431
	[0.090]	[0.093]	[0.086]	[0.092]	[0.082]	[0.088]
NoStateMLR*Post-ACA	-0.3756***	-0.3507***	-0.3504***	-0.2920**	-0.4167***	-0.3179***
	[0.111]	[0.115]	[0.107]	[0.115]	[0.103]	[0.110]
Size	0.7076***	0.7835***	0.6554***	0.7490***	0.6744***	0.7761***
	[0.080]	[0.082]	[0.071]	[0.075]	[0.064]	[0.069]
Capitalization	-0.6674***	-0.7637***	-0.6807***	-0.7692***	-0.6744***	-0.7526***
	[0.107]	[0.111]	[0.094]	[0.101]	[0.084]	[0.091]
Mutual	-0.4586	-0.5766	-0.4899	-0.6205	-1.2657**	-1.4606**
	[0.518]	[0.534]	[0.446]	[0.477]	[0.628]	[0.676]
Group	0.1076	0.1465	0.1488	0.1727	0.0821	0.1143
	[0.187]	[0.192]	[0.161]	[0.172]	[0.143]	[0.154]
Percent Group Insurance	-0.0550	0.1259	-0.3525**	-0.1143	0.3531**	0.8300***
	[0.127]	[0.130]	[0.155]	[0.166]	[0.173]	[0.186]
Age	-0.7308***	-0.9686***	-0.6523***	-0.9475***	-0.4194***	-0.6783***
	[0.149]	[0.153]	[0.131]	[0.140]	[0.114]	[0.122]
NonProfit Indicator	-0.9568**	-0.9538**	-0.9291**	-0.9403**	-1.1495***	-1.0933**
	[0.464]	[0.477]	[0.399]	[0.427]	[0.409]	[0.441]
Total States	-0.0247	0.0104				
	[0.020]	[0.020]				
Constant	-11.3002***	-11.9640***	-10.3724***	-11.1063***	-10.8245***	-11.6041***
	[0.964]	[0.993]	[0.830]	[0.888]	[1.000]	[1.077]
Observations	4,573	4,573	3,890	3,890	3,078	3,078
R-squared	0.7313	0.7472	0.7916	0.8011	0.8602	0.8661

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
Company-fixed effects included
Source: Authors' analysis of health insurer data from the NAIC, AHIP and state statutes for the years 2001–2014. Notes: Analyses using quantile regression. Models are at 5th percentile, 25th percentile, 75th percentile and 95th percentile. Analyses control for firm-specific effects. Clustered standard errors used.

The results are generally consistent with what is reported in Table 4 for the full sample, with two exceptions. The *NoStateMLR* variable is not significant in the monostate insurer models. This suggests that insurers that focus operations in a single state may be better able to manage state MLR requirements so that these firms are not negatively affected by this regulation. We do also find that the *Post-ACA* variable is negative and significant in the models including only insurers operating in three or fewer states. This suggests that for insurers operating in just a few states, the ACA's MLR requirement negatively affected market share.

Next, we consider whether the effect of MLR requirements varies based on the extent of market share. The main analysis provides insight into the effect of the independent variables on the conditional mean of health insurer market share. However, the range of the market share held by a given insurer varies considerably, and a firm's ability to adapt to changes may be affected by its power in the marketplace. As noted in Harrington (2013), to the extent that MLR requirements result in greater economies of scale, it is possible that there could be substantial differences in the effect of state and federal MLR legislation depending on the extent of market share held by insurers. For example, insurers with larger market shares may be more or less affected by the state and/or federal MLR requirements relative to insurers with smaller market shares. To determine if this is the case, we conduct an additional analysis using quantile regression. This analysis allows us to examine the effect of factors, specifically the state and federal MLR requirements, on varying points along the distribution of market share, not just the conditional mean.[20] In this analysis, we consider insurers at the median and the extremes—the 5th and 95th market share percentiles. The results of this analysis are presented in Table 6 (on page 16). Here, market share is measured using premiums earned.

These quantile regression models yield some additional insights into the effect of the state and federal MLR requirements on insurers. As with the models reported in Table 4, we find that insurers operating in states with no existing MLR requirements have higher market shares compared to insurers operating in states with MLR requirements, except for insurers with very little market share. For the firms in the smallest quantile, state MLR requirements do not have a statistically significant effect on market share. We also find that the effect of the state MLR requirements tends to be greater for insurers with larger market shares.

The *Post-ACA* is also significant and negative for the insurers with low and median market shares, but the magnitude of the effect declines as market share increases. Additionally, for insurers with the largest market shares, *Post-ACA* is significant and positive, indicating that the federal MLR requirement positively affected insurers with the largest market shares. This varying effect based on market share may explain the lack of significance of the *Post-ACA* variable in Table 4.

Finally, when we consider the joint effect of the interaction between *NoStateMLR* and *Post-ACA*, we again find that post-ACA, market shares are lower

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20. For more information on quantile regression analysis, see "Quantile Regression" by Roger Koenker (2000) at *www.econ.uiuc.edu/~roger/research/rq/rq.pdf*.

for insurers operating in states with no MLR requirement.[21] If this ultimately leads to increased market concentration and/or less competition in the marketplace, this could have long-term implications for consumers.

Table 6:
Quantile Model Results

| | Percentiles | | |
	5	**50**	**95**
NoStateMLR	-0.0112	0.5483***	0.6512***
	[0.103]	[0.082]	[0.207]
Post-ACA	-0.7183***	-0.1169***	0.0829***
	[0.122]	[0.041]	[0.015]
NoStateMLR*Post-ACA	-0.1585	-0.1381***	-0.1485***
	[0.109]	[0.046]	[0.016]
Size	0.9094***	0.5213***	0.4319***
	[0.179]	[0.041]	[0.018]
Capitalization	-0.4275***	-0.3557***	-0.7074***
	[0.069]	[0.043]	[0.027]
Mutual	-1.8063	-0.1180	0.1280
	[2.114]	[0.200]	[0.094]
Group	0.2573***	0.0690	0.0603*
	[0.085]	[0.050]	[0.031]
Percent Group Insurance	0.0353	-0.1951	-0.7043***
	[0.209]	[0.143]	[0.170]
Monostate	2.6403**	0.0783	-0.4348***
	[1.116]	[0.100]	[0.028]
Age	-0.5098**	-0.7389***	-1.1196***
	[0.213]	[0.119]	[0.090]
Non-Profit	-1.6072	-0.9058***	0.1160
	[2.236]	[0.283]	[0.141]
Constant	-22.0064	-12.4445**	-9.8758***
	[48.180]	[6.138]	[0.794]
Observations	4,573	4,573	4,573

Robust standard errors in brackets
*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Company-fixed effects included
Source: Authors' analysis of health insurer data from the NAIC, AHIP and state statutes for the years 2001–2014. Notes: Analyses using quantile regression. Models are at 5th percentile, 25th percentile, 75th percentile and 95th percentile. Analyses control for firm-specific effects. Clustered standard errors used.

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21. The results using member months as a measure of market share are consistent with the results presented in Table 6.

Conclusion

Overall, our study indicates that MLR regulations have significant consequences for the market share held by insurers in the individual health insurance marketplace. We find evidence that insurers operating in states with MLR regulations in place prior to the ACA generally had lower market shares than insurers operating in states without pre-ACA MLR regulations. Consistent with the notion that MLR regulations are associated with reductions in an insurer's market share, we also find evidence that the ACA MLR regulations led to greater reductions in market shares of individual health insurers operating in states with no prior MLR regulations.

To the extent that the MLR is a measure of the price-to-cost ratio, our results suggest that MLR regulations may limit individual insurers' ability to leverage the price-enhancing benefits of market power. As a result, a given individual health insurer's market share is generally lower under MLR regulations. This may also reflect a shift into other lines of business not subject to MLR regulations (e.g., disability or long-term care insurance) by individual health insurers in response to the profit-limiting MLR regulations. In either case, states that relax the MLR requirement may experience a more concentrated market which could lead to fewer choices for consumers. Additionally, the potential MLR change has to be considered in conjunction with other changes made to the ACA, specifically the removal of subsidies to insurers for providing lower deductibles and out-of-pocket costs to low income individuals. This may make providing individual coverage less attractive to insurers, resulting in further concentration within the industry. Given the uncertainty surrounding the future of the ACA, our study provides policymakers with some insight into the potential effect of state changes to MLR requirements, and other provisions for health insurers and potentially the health insurance marketplace overall. However, it will likely take several years before the effect of these recent changes are known.

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Cummins, J. David and Richard A. Derrig, eds., 1989. *Financial Models of Insurance Solvency*, Norwell, Mass.: Kluwer Academic Publishers.

Manders, John M., Therese M. Vaughan and Robert H. Myers, Jr., 1994. "Insurance Regulation in the Public Interest: Where Do We Go from Here?" *Journal of Insurance Regulation*, 12: 285.

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