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Proposal for ARIA 2019 Meeting in San Francisco

## **Do Some Health Insurers Consistently Perform Better than Others?**

### **Abstract**

The results of this research were surprising. Consistently, from 2002 to 2016, there is one group of health insurers that perform well and better than others as measured by return on capital (and also return on assets). The group is of those insurers specializing in Medicaid, the public assistance program. We do not speculate why the result is so striking, but are delving into ensuring that our methodologies are accurate in arriving at such a result that can inform policymakers in this highly debated arena of health insurance and health care. We use the rich health insurers' annual filings for 2002-2016. We have non-granular data for return on capital (and assets), care utilization, and medical expenses per insured. We are able to create five distinct health insurance market groupings of insurers: Group, Medicare, Medicaid, Individual and Federal, assigning an insurer to a market if 70+% of its insureds are in that market. Both simple and complex analyses revealed unexpected success for Medicaid specialty insurers, which consistently outperformed other specialists and did not show losses. Another surprising result has to do with the utilization: positive relationship between Medicaid and Medicare specialists' income and the number of hospital days utilized by their members. For Group specialists (of insured employers), the opposite holds. Importantly, the ACA of 2010 did not affect these surprising results.

Code: Health insurance; utilization; health insurance specialists; managed care; health insurance markets; performance

# Do Some Health Insurers Consistently Perform Better than Others?

## I. Introduction

This study provides unique contributions to the field of health insurance and health care in the US. In our attempt to see how the 2008 financial crisis and the Affordable Care Act of 2010 effected the performance of health insurers that provide full risk coverage, we discovered surprising results regarding insurers that specialize in serving the Medicaid population. This simple results prompted us to delve into much more sophisticated regression analyses to ensure the results can stand greater scrutiny. So, before giving the “punch line,” let us go systematically through the process of our exploration.

We look to the rich data of health insurers as a source of new insights into our current healthcare landscape. By analyzing the practices and experiences of specialist health insurers we aim to provide policymakers with a fresh perspective through which to consider future healthcare reform.

The health insurance industry is a key player in the US health care system.<sup>1</sup> Insurers assume risk, act as the financial intermediaries between consumers and health care providers and influence care management. Their financial viability is critical to the functioning of the system. Health insurers provide comprehensive coverage to five distinct markets:

- Group health insurance (mostly employer coverage)

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<sup>1</sup> For a visual representation of the insurance industry-health care nexus see: Baranoff EG, Baranoff D, Sager T, Shi B. What US health insurers' data show for ACA 'repealers.' *The American Journal of Accountable Care*, 2016 September. <http://www.ajmc.com/journals/ajac/2016/2016-vol4-n3/what-us-health-insurers-data-show-for-aca-repealers/>

- Individual health insurance (including ACA marketplaces<sup>2</sup>)
- Federal employee health insurance
- Medicare
- Medicaid

Each of these markets implements a different approach to the provision of medical services to covered persons<sup>3</sup> But, the administrative and loss adjustment expenses are not substantially different for the specialty insurers in the different market. Each poses different challenges to health insurers in covering healthcare services efficiently so that insurers can make a profit. In this paper, we show that there are meaningful differences among the markets in insurer profitability, in utilization of medical services, and in medical costs – frequency and severity of care services. Our approach is to focus upon health insurers that specialize in one market. Many insurers do specialize. The performance of insurers that specialize in Medicaid programs is very different from the performance of insurers that specialize in employer (Group) full insurance (as opposed to self-insurance). Our focus upon insurer specialists allows the differences among the markets to emerge most clearly. In fact, we find that Medicaid specialists are the most profitable, with the lowest costs, despite high utilizations.

Another unexpected finding is the positive correlation between Medicare and Medicaid insurers' income and days in the hospital of patients in these markets. This is in contrast with the result for the Group specialty insurers, who show lower income as days in the hospital increase. Additional

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<sup>2</sup> See: "Risk Management for Enterprises and Individuals" by Baranoff, Brockett, Kahana and Baranoff, Flat World Knowledge, 2019, chapter 22, link: [https://catalog.flatworldknowledge.com/catalog/editions/baranoff\\_2-risk-management-enterprises-individuals-2-0](https://catalog.flatworldknowledge.com/catalog/editions/baranoff_2-risk-management-enterprises-individuals-2-0)

<sup>3</sup> See administrative and Loss Adjustment Expenses in Working paper "Is it True that Medicare Expenses are Much Lower? What is being Compared?" by Baranoff, E, Dalit Baranoff, Tom Sager and Bo Shi, 2018

investigation is needed to determine how insurers specializing in Medicaid and Medicare (and receiving a fixed fee per enrollee) have been able to parlay greater hospital utilization into better performance. While further research will be necessary to fully explain our results, our findings contain potentially important policy implications and could offer guidance for policymakers and others searching for more efficient ways to organize the U.S. healthcare delivery system.

In our analysis, we utilize the health insurers' data-rich annual financial statements, filed with the National Association of Insurance Commissioners (NAIC). In addition to the usual financial data and member numbers, health insurers report on several measures of healthcare utilization. The annual statements include data on three utilization variables: the number of encounters with healthcare providers, admissions to the hospital, and days in the hospital. They also report hospital and underwriting expenses.

Separation of the NAIC health insurance data into the five distinct markets by members facilitates our comparative analysis of insurers' by specialty segments. Following Baranoff, Sager and Witt, 1999, we designate an insurer as a specialist if 70% or more of its members (insureds) are in a single market. Segmentation based on product focus has theoretical foundation based on transaction cost economics as well as practical justification based on payor and covered population characteristics

Using the health insurers' data we are able to identify differences in utilization of services among market specialists and compare their performance (using return on capital) without resorting to loss ratios as proxies of performance.<sup>4</sup>

For our analysis of performance and care utilizations, we begin with simple trend analyses of the period 2002-2016. Findings are confirmed and extended with more complex annual and multi-year regressions that control for possible confounding effects. We find that the Medicaid specialist insurers were more profitable (for the entire period, 2002-2016) than the other four types of specialist insurers. This result holds for both simple trends and more complex analyses, despite the greater rate of health care utilization per member per month for Medicaid insureds. These Medicaid specialist insurers had lower hospital and underwriting expenses than other specialists throughout the period

Our univariate and multivariate analyses confirmed the superior performance of Medicaid specialty insurers throughout the study period. They also indicate a positive relationship between the performance of both Medicaid and Medicare insurers and the number of days in the hospital utilized by their members (with increasing days correlating with improved financial performance)—an unexpected result.

As noted above, the purpose of this paper is not to try to explain these findings, but to highlight them for policymakers. The success of future healthcare reform, whether it takes the form of

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<sup>4</sup> Financial performance is proxied by return on capital (ROC). Since most insurers are not publicly traded, ROC is used as a substitute for return on equity. See McCue M, Hall M, Liu X. Impact of medical loss regulation on the financial performance of health insurers. *Health Affairs*. 2013;32(9):1546-51; McCue MJ, Hall M. Health insurers' financial performance and quality improvement expenditures in the affordable care act's second year. *Medical Care Research and Review*. 2015;72(1):113-22.

modifying, replacing or improving the ACA, will require greater insights into what works and what does not work in its current incarnation. That Medicaid specialist insurers outperform other specialists may be the result of the population they serve, but it also suggests that these specialty insurers may be operating more efficiently, thus, their practices merit further investigation. While additional research is required to determine why Medicaid specialists have been so consistently profitable, their practices and their public-private partnership model of health insurance potentially could provide a prototype for future healthcare reform.

The unexpected finding of a positive relationship between Medicare and Medicaid income and days in the hospital of patients in these markets is all the more extraordinary because it is the opposite of the result for the Group specialty insurers, whose relationship is negative - lower income as days in the hospital increase.

This paper is structured as follows: next is discussion of the data in Section II. Section III is devoted to Analytical Methods and Results. Section IV describes the conclusions.

## **II. Study Data**

Health insurers operating in the US submit annual filings to the NAIC. Our current work is based on NAIC health insurer data filings for 2002-2016, which includes the years preceding the ACA, the 2008 financial crisis, and full implementation of the ACA.

## **a. Sample Size**

The proportion of the US population covered by health insurers in our data has grown from about one-third in 2002 to about one-half in 2016. In July 2002, with US population approaching 288 million, health insurers reporting to the NAIC covered nearly 93 million members (33%). By July 2016, that number had grown to 156 million insured, out of a total US population of nearly 322 million (49%).<sup>5</sup> These figures do not represent the entire “insured” population, only the proportion with risks covered by insurers that file with the NAIC as health insurers. The figures exclude persons covered by health insurance sold by life or property/casualty insurers or by self-insured plans, in which employees receive health coverage from employers that self-insure with assistance from Third Party Administrators (TPAs).

Health insurers also have a substantial presence in government health insurance programs.

Health insurers currently insure over half of the Medicaid market, which includes both Medicaid and the Children’s Health Insurance Program (CHIP). (All Medicaid figures cited in this paper included CHIP as well). In 2016, insurers covered nearly 40 million Medicaid beneficiaries, out of a total Medicaid/CHIP population of nearly 74 million (56.5%). This proportion has more than doubled since 2002 (when insurers covered less than 12 million out of a Medicaid population of 42.4 million, 27.4%). The financial crisis of 2008 and, later, the ACA’s Medicaid expansion, both contributed to the rapid growth of the Medicaid market.<sup>6</sup>

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<sup>5</sup> NAIC Insurance Data Products. Annual Health InfoPro Data Sets, 2002-2016 (hereafter referred to as “NAIC Data”)

<sup>6</sup> NAIC Data; Medicaid enrollment data for 2002 from Kaiser Commission on Medicaid and the Uninsured. Medicaid Enrollment: An Overview of the CMS April 2014 Update, June 2014. 2016 Enrollment figures are based on CMS monthly Medicaid enrollment from CMS, Medicaid & CHIP Monthly Applications, Eligibility Determinations, and Enrollment Reports: January 2014 - April 2017 (preliminary), May 2017. (Tables for 2002-2016 available upon request).

The Medicare market has also grown. However, the proportion of Medicare patients receiving coverage through private health insurers (typically through Medicare Advantage) represents only about a quarter of the total Medicare population (14 million out of a total 57 million in 2016). In 2002, less than 10% of Medicare beneficiaries were covered by health insurers (3.6 million out of 39.6 million, 9%).<sup>7</sup>

## **b. Study Design**

As we explained in the Introduction, we utilize the NAIC’s division of health insurance coverage into five distinct markets: Group, Individual Federal, Medicare and Medicaid, to differentiate among the health insurers. Using the numbers of members in each market, we separated the health insurers that provide comprehensive health coverage into their specialty markets.

We designate an insurer as a specialist if 70% or more of its members (insureds and their covered family members) are in a single market.<sup>8</sup> Assigning insurers to one of the five specialty market segments if 70% or more of covered members are in that market leaves some insurers unassigned. Such insurers would have substantial presences in two or more markets. We assign such insurers to a “combination” segment.

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<sup>7</sup> *NAIC Data*; 2002 Medicare enrollment data from Centers for Medicare & Medicaid Services. Medicare & Medicaid Statistical Supplement 2011 Edition. 2016 Medicare enrollment data extrapolated from Jacobson G, Casillas G, Damico A, Neuman T, Gold M. Medicare Advantage 2016 spotlight: enrollment market update. Kaiser Family Foundation. May 11, 2016. (Tables for 2002-2016 available upon request).

<sup>8</sup> Baranoff, et.al 1999. In this paper, 70% of premiums is designated as the cutoff for specialization. Here we use 70% of members.

Because the combination insurers have a mix of insureds, the character of the insured population does not have unique attributes. This group of insurers is used as benchmark in the more complex comparative analyses. In some of our annual analysis we also do not show the Individual and Federal markets due to the small number of specialist insurers operating in these two markets.

We compare financial performance of all specialist and non-specialist segments, but compare only Group, Medicare, and Medicaid specialists for annual trends in health care utilizations, and medical and underwriting expenses over the study period.

To measure health care utilizations, we use encounters, admissions and days in the hospital per member per month. Because our focus is on specialty insurers within the market segment in which they specialize, our analysis considers only the utilization data for members within an insurer's specialty market and ignores an insurer's members in other markets. Thus, when analyzing a Medicaid specialist, we look only at healthcare utilization of the Medicaid enrollees who make up the insurer's core business. Similarly, for a Group specialist, we are concerned only with the members of its Group market. Including non-core business would dilute the effects of specialization, which we seek to highlight.

### **c. Variables**

The variables we use for the health insurers' data in the analyses include the following (The actual labels of the variables will be shown with the applicable exhibits):

- Numbers of members (insureds - including family members) – annual and per month data
- Market specialty segmentation – a categorical 1-0 variable
- Frequency and severity of claims by:
  - Encounters with providers per member per month per market specialty
  - Admissions to hospitals per member per month per market specialty
  - Days in the hospital per member per month per market specialty
  - Underwriting and hospital expenses per member annually per market specialty
- Insurers' basic and financial data:
  - Performance – profits and losses – return on capital
  - Asset risk taking (investments in stocks)
  - Capital structure (capital divided by assets)
  - Total comprehensive health business medical loss ratio
  - Risk-based capital is an insurance regulatory ratio for capital adequacy
  - Categorical variables for insurers that are part of larger groups with part of a group equal to 1.
  - Categorical variables for insurers that are stock vs. mutual companies with stock insurers equal to 1
  - Size of the insurers measured by combination of assets, liabilities and premiums written
  - Number of states insurer operates within

### **III. Analytical Methods and Results**

In part (a) of this section, we present several charts of trends for each specialty. The charts show time trends in performance, the number of insurers in each specialty, and utilizations of medical services and expenses. The performance and utilization trends are shown for the median insurer in each specialty. More clearly than the mean, the median better reflects the experience of the typical insurer. These simple analyses suggest interesting relationships among the specialties and their behavior over time. We also conducted correlation analyses and discuss the results.<sup>9</sup> In part (b) of this section, we subject the tentative results of section (a) to further and deeper analysis. We check to see if the results can withstand close scrutiny. The scrutiny is two-fold: First, results of multi-year regressions for all specialties together, in the presence of appropriate control variables, are shown in Exhibit 7 and further discussed below. Second, results for multi-year regressions for the bigger specialties separately (Group, Medicare and Medicaid), in the presence of added specialty-specific annual expenses and utilizations per member per month are shown in Exhibits 8 and 9 and further discussed below.

#### **a. Trends for the Median Specialist Insurer**

Exhibits 1-6 show trends in certain key variables by specialist insurer segment. Exhibit 1 suggests that the Medicaid specialist insurers generally perform better financially than the other specialty and non-specialist segments. Exhibit 2 provides the number of insurers in each specialty. Note that in recent years, fewer than 50 health insurers have specialized in the individual market (which includes the ACA exchanges). Median returns on capital for the individual specialty indicate that this specialty experienced substantial losses in recent years and

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<sup>9</sup> Not featured here, available upon request

that its performance is very volatile. In many years, the non-specialist “combination” segment outperformed all specialists, but for the Medicaid segment. As will be explained later, the combination segment is used as a baseline benchmark in the multivariate, multi-year comparative regression analyses.

**Insert Exhibit 1: Median Performance of Specialist Health Insurers (Measured by Return on Capital), 2002-2016.**

Exhibit 2 demonstrates substantial shifts in the numbers of insurers specializing in each of the five markets during the 2002-2016 period. The most prominent change occurs in the Group specialty (with large movement to self-insurance), which sees a decline of more than 50% of specialized health insurers over the period. This downward trend began before the 2008 financial crisis and continued through the implementation of the ACA in 2010.

Among the factors contributing to the growth of Medicaid specialists may be an increasing Medicaid population, effects of the 2008 financial crisis, Medicaid expansion in many states post ACA, and increasing insurer recognition of the profit potential in Medicaid. The growth of the Medicaid specialty market is particularly noteworthy given the consistent, better performance of Medicaid specialty insurers compared to the other specialists.

**Insert Exhibit 2: Health Insurance Specialists by Market, 2002-2016.**

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In Exhibits 3-5 we provide comparative analyses of the utilizations per member per month in each of the largest specialties. Consistently, the median encounters per member per month, admissions per member per month and days in the hospital per member per month are lowest for the Group specialty and highest for the Medicare specialty, as might be expected from the demographics of the covered populations. Group specialists cover working people between the ages of 20-65 while Medicare covers the aging population. It is noteworthy that the utilization gap between Medicare and Medicaid specialists considerably exceeds the utilization gap between Medicaid and Group. For both Group and Medicaid specialists, encounters with providers increased from 2002 to 2016 while hospitalization admissions and days in the hospitals per member per month stay flat.

The question of use and effectiveness of Medicaid is much debated. With the NAIC data, we cannot evaluate the effectiveness or quality of health care delivered by the Medicaid specialists. But we can evaluate care utilization services and its cost.

The debate on Medicaid includes two opposing interpretations of existing data, often colored by political ideology. At one extreme are those arguing that Medicaid is inferior in access and services. A prominent example of this viewpoint is Scott Gottlieb's March 2011 *Wall Street Journal* commentary provocatively titled "Medicaid Is Worse Than No Coverage at All." The conservative-leaning Heritage Foundation has also published several studies in this same vein. A high-profile proponent of this perspective is Avik Roy, editor at *Forbes* and the author of *How Medicaid Fails the Poor*. Roy and other Medicaid detractors argue that Medicaid patients have less access to physicians and receive poorer quality care. Low Medicaid reimbursement rates and

bureaucratic red tape are often cited as well.<sup>10</sup> Our trends in Exhibits 3-5 indicate fewer services per member per month for Medicaid members compared to the Group members. However, we do not have data regarding differences in health conditions between Group and Medicaid insured members or health care outcomes.

On the other hand, recent work by Kaiser Family Foundation disputes the claims of limited access (at least for primary care).<sup>11</sup> But the counter argument – that Medicaid is effective – depends largely on studies comparing Medicaid patient health outcomes with outcomes of the uninsured or with outcomes under private health insurance. Ranging from analysis of patient satisfaction surveys to case studies of state Medicaid expansion (before and after ACA), these studies aim to debunk the negative perception of Medicaid as substandard. This research focuses primarily on how expansion of Medicaid has increased access to health care for certain groups, reduced emergency care/uncompensated care, and produced other positive outcomes.<sup>12</sup> A recently published report on the results of the National Medicaid Consumer Assessment of

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<sup>10</sup> Roy A. How Medicaid fails the poor. Encounter Books; 2013; Gottlieb S. Medicaid is worse than no coverage at all. *Wall Street Journal*. 2011 Mar 10;10; Dayaratna KD. Studies show: Medicaid patients have worse access and outcomes than the privately insured. *The Heritage Foundation Backgrounder*. 2012 Nov 9;2740.

<sup>11</sup> Paradise J, Garfield R. What is Medicaid's impact on access to care, health outcomes, and quality of care? Setting the record straight on the evidence. Menlo Park, CA: Kaiser Family Foundation, August. 2013; See also Coughlin T, Long SK, Clemans-Cope L, Resnick. What difference does Medicaid make? Assessing cost effectiveness, access, and financial protection under Medicaid for low-income adults." Menlo Park, CA: Kaiser Family Foundation. May 2013;

<sup>12</sup> Jacobs PD, Duchovny N, Lipton BJ. Changes In Health Status And Care Use After ACA Expansions Among The Insured And Uninsured. *Health Affairs*. 2016 Jul 1;35(7):1184-8; At federally funded health centers, Medicaid expansion was associated with improved quality of care. *Health Affairs*. 2017;36(1):40-8; Han X, Nguyen BT, Drope J, Jemal A. Health-related outcomes among the poor: Medicaid expansion vs. non-expansion states. *PloS One*. 2015;10(12):e0144429; Marino M, Bailey SR, Gold R, Hoopes MJ, O'Malley JP, Huguet N, Heintzman J, Gallia C, McConnell KJ, DeVoe JE. Receipt of preventive services after Oregon's randomized Medicaid experiment. *American Journal of Preventive Medicine*. 2016 Feb 29;50(2):161-70; Sommers BD, Blendon RJ, Orav EJ, Epstein AM. Changes in utilization and health among low-income adults after Medicaid expansion or expanded private insurance. *JAMA Internal Medicine*. 2016;176(10):1501-9; Wherry LR, Miller S. Early coverage, access, utilization, and health effects associated with the Affordable Care Act Medicaid expansions: a quasi-experimental study. *Annals of Internal Medicine*. 2016;164(12):795-803.

Healthcare Providers and System (CAHPS) survey of over 270,000 adults enrolled in Medicaid during the fall of 2013 indicates high levels of satisfaction with both their access to and the quality of the healthcare they received.<sup>13</sup>

Our Exhibits add another layer to the Medicaid debate, from the point of view of the insurers' data.

**Insert Exhibit 3: Median Encounters with Providers (per Member per Month) by Specialty.**

**Insert Exhibit 4: Median Hospital Admissions (per Member per Month) by Specialty.**

**Insert Exhibit 5: Median Days in the Hospital (per Member per Month) by Specialty.**

Exhibit 6 provides a measure of cost that includes hospital expenses and underwriting costs for the insurers. It is measured per member annually. The median for Medicaid specialists is the lowest consistently, but not substantially below the Group cost.

**Insert Exhibit 6: Median Hospital and Underwriting Expenses (per Member per Year) by Specialty.**

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<sup>13</sup> Barnett ML, Sommers BD. A national survey of Medicaid beneficiaries' expenses and satisfaction with health care. *JAMA Internal Medicine*. 2017 Jul 10.

We also conducted basic correlation analyses for the whole 2002-2016 period for each of the specialty insurers for their utilizations and expenses that are shown in Exhibits 3-6 (not featured). In the Medicare specialty, the largest correlation was 0.468 between the admissions per member per month and days in the hospital per member per month. In the Medicaid specialty, the largest correlation was 0.777 between the admissions per member per month and days in the hospital per member per month. None of the other correlations reached 0.430. In the Group specialty, the largest correlation was 0.790 between the admissions per member per month and days in the hospital per member per month. None of the other correlations reached 0.300. Thus, as would be expected, admissions and days in the hospital are the only utilizations with high correlations while the others are minimally correlated. Hospital and underwriting expenses have very low correlations with the utilizations across the specialties.

**b. Multivariate Analysis**

In part (b) we develop statistical models that can test the tentative results for the specialties that were uncovered by the simple charts of part (a). These part (b) models are multivariate regressions that include controls and predictors that could potentially explain away specialty differences and trends found in part (a). Our model estimation uses the GEE methodology (generalized estimating equations), rather than OLS (ordinary least squares) because of the panel structure of our dataset. The same insurers repeat in multiple years, which means that the data points are not all independent of each other. GEE corrects this violation of standard regression assumptions.

In this section, we also split the study period into three parts – before the financial crisis of 2008, from the financial crisis to the passage of the ACA in 2010, and after the ACA – and perform similar multivariate analyses for each separate period. (We also conducted annual regressions that are available upon request.) The separate analyses highlight changes in the relationships that are period-specific.

**i. Comparative Analysis Of the Specialties’ Performance**

The first analysis is to detect differences in the performance (RetOnCap)<sup>14</sup> of specialties over time. The first model is for the entire health insurance industry, using all insurers, whether specialized or not. To detect overall differences among specialties, we create four 0-1 indicator variables, Group Specialist, Individual Specialist, Medicare Specialist and Medicaid Specialist. Thus, an insurer has the value Group Specialist =1 if it is a Group specialist and the value 0 otherwise; etc. The non-specialists and the few Federal specialists have the value 0 on all four indicators. Thus, the non-specialists and Federal specialists are benchmarks. For example, the coefficient of Group Specialist indicates how much greater (positive coefficient) or smaller (negative coefficient) the average return on capital is for a Group specialist than it is for a non-specialist/Federal insurer. Statistical significance for these indicators is statistical significance of the difference, rather than statistical significance of the specialty in some absolute sense. The control variables do not include utilizations; specialization-specific utilizations are introduced subsequently as controls in the separate models for each specialty.

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<sup>14</sup> We also conducted the analysis for Return of Assets. The results were very similar.

The results of the whole-industry analysis are shown in Exhibit 7 for the whole period 2002-2016 and for the sub-periods before the 2008 financial crisis (2002-2006), afterwards and before the ACA (2007-2010) and post ACA (2011-2016). (Supplemental material relating to these analyses is available upon request.)

**Insert Exhibit 7: Comparison of Specialist Performance Results by Time Periods: Analysis Of GEE Parameter Estimates.**

A review of Exhibit 7 shows the following results in support of the simple trend analysis of performance that was displayed in Exhibit 1.

- The Medicaid specialists consistently had the highest performance: For the whole time period, their return on capital was an estimated 5.59% higher than the benchmark non-specialists combination/Federal,  $5.59 - 2.38 = 3.21\%$  higher than Group,  $5.59 - (-6.12) = 11.71\%$  higher than Medicare, and  $5.59 - (-18.56) = 24.15\%$  higher than Individual. For each sub-period, the Medicaid specialists also have the highest performance. The Medicaid advantage over the benchmark segment is statistically significant for all periods except for 2002-2006.
- The Combination/Federal and Group segments are statistically indistinguishable from each other for all time periods (indicated by high p-values on the Group coefficients.) These two segments together occupy the next best performance position, below Medicaid specialists, but above Medicare and Individual specialists. Both the Individual and Medicare coefficients are all negative, indicating lower performance than the benchmark Combination/Federal segment.

- The Medicare specialists segment takes the next lower position in performance, averaging 6.12% below benchmark for the whole time period, and 2-5% below in the separate time periods, although the latter do not rise to the level of statistical significance.
- The Individual specialists segment, which now includes ACA marketplaces, takes the bottom performance position. For the whole period, it is 18.56% below benchmark. Its position has deteriorated over time, dropping from only 1.6% below benchmark in 2002-2006, to 13.32% below in 2007-2010, to 28.62% below most recently, in 2011 to 2016. As the Individual segment's performance has dropped, the statistical significance of the drop has increased.

## **ii. Relationship of Performance with Utilizations by Specialty**

The whole-industry analysis discussed in the preceding subsection does not account for the possible effect of utilizations on performance. That is because the most relevant utilization for Group specialists (say) is utilization by Group insureds. This can be accounted for most transparently in an analysis of performance of Group specialists, rather than the whole industry. In our second model, we try to explain the relationship between performance (RetOnCap) and care utilization and expenses in the specialties shown in Exhibits 3-6, Group, Medicare and Medicaid for the whole period 2002-2016 (Exhibit 9) and the most recent period 2011-2016 (Exhibit 8). Individual specialist insurers are excluded due to the small number of insurers as shown in Exhibit 2. Thus, for each specialty we run a separate regression using the specialty's own utilization by its own members per month.

**Insert Exhibit 8: Performance Results for Specialists (with Utilizations per Member per Month and Expenses per Member Annually per Specialist as Control Variables) 2011-2016.**

**Insert Exhibit 9: Performance Results for Specialists (with Utilizations per Member per Month and Expenses per Member Annually per Specialist as Control Variables)2002-2016.**

Among the most noteworthy results to be extracted from Exhibits 8 and 9 are that patient days in the hospital relate positively to performance for government program specialists (Medicaid and Medicare) in both Exhibit 8 for the most recent period of 2011-2016 and in Exhibit 9 for the whole period 2002-2016. The relationship is more significant for the whole time period, for which there are more data, than for the recent time period. By contrast, the same relationship is negative for the employer (Group) specialists.

It is worth looking more closely at this finding. Suppose we take two Medicaid specialists, insurer A and insurer B, over the whole time period. Both spend the same amount on hospitalization and underwriting per member annually (recently, about \$4,000). But A provides twice as many days of hospitalization per member per month as B, which provides about 0.04 days per member per month (about average for Medicaid specialists – see Exhibit 5). Then, according to Exhibit 9, A can be expected to have a larger return on capital than B by about  $0.04 \times 0.1076 = 0.0043$ . To put this into context, the typical Medicaid specialist recently has had a return on capital of about 10% (see Exhibit 1). The increase of 0.0043 would mark an improvement in return on Capital of about  $0.0043 \div 0.1000 = 4.3\%$ . That is, Medicaid specialists that spend the same amount annually on patients but keep them in the hospital longer when they get sick, do better financially. This observation also holds for Medicare specialists. Moreover, since the proportion of members covered by the insurer's Medicaid programs is a control

variable, the benefit to longer hospitalization cannot be accounted for by adjusting the insurer's mix of market types within the permitted 70%-100% Medicaid range.

By contrast, Group specialists that spend the same amount on patients but keep them in the hospital longer do worse. The Group coefficient for hospital days is -1.1338. For an increase of 0.04 days of hospitalization per member per month, a health insurer could expect a hit of  $0.04 \times (-1.1338) = -0.045$ , a reduction in return on capital on the order of half. This would be huge.

We do not know why there appears to be a benefit from lengthening hospitalization. Note that there is not a corresponding effect for admissions or for provider encounters. It might be suggested that longer hospitalization may beneficially counter later re-hospitalizations for the same condition. But the insurer data do not permit us to address this possibility. It might also be suggested that Medicaid and Medicare specialists may negotiate better volume discounts with hospitals than other kinds of specialists can. Again, the available data do not permit us to investigate this possibility.

We also note that, with utilization and annual expenses held constant, an increase in an insurer's proportion of members in Medicaid programs is associated with a reduction in return on capital (coefficient = -0.3462, see Exhibit 9). *Ceteris paribus*, the difference between a 70% Medicaid specialist and a 100% Medicaid specialist could be substantial:  $-0.3462 \times (1.00 - 0.70) = -0.104$ . This figure is the same order of magnitude as the mean return on capital of the Medicaid segment in recent years.

With utilizations and the percentage of member specialization held fixed, an increase in expenses (“severity” index) is associated with a decrease in return on capital. The coefficient of severity is always negative, although it rises to statistical significance only for Medicaid and Medicare specialists for the whole time period. The sign is in accord with expectation.

### **III. Conclusion**

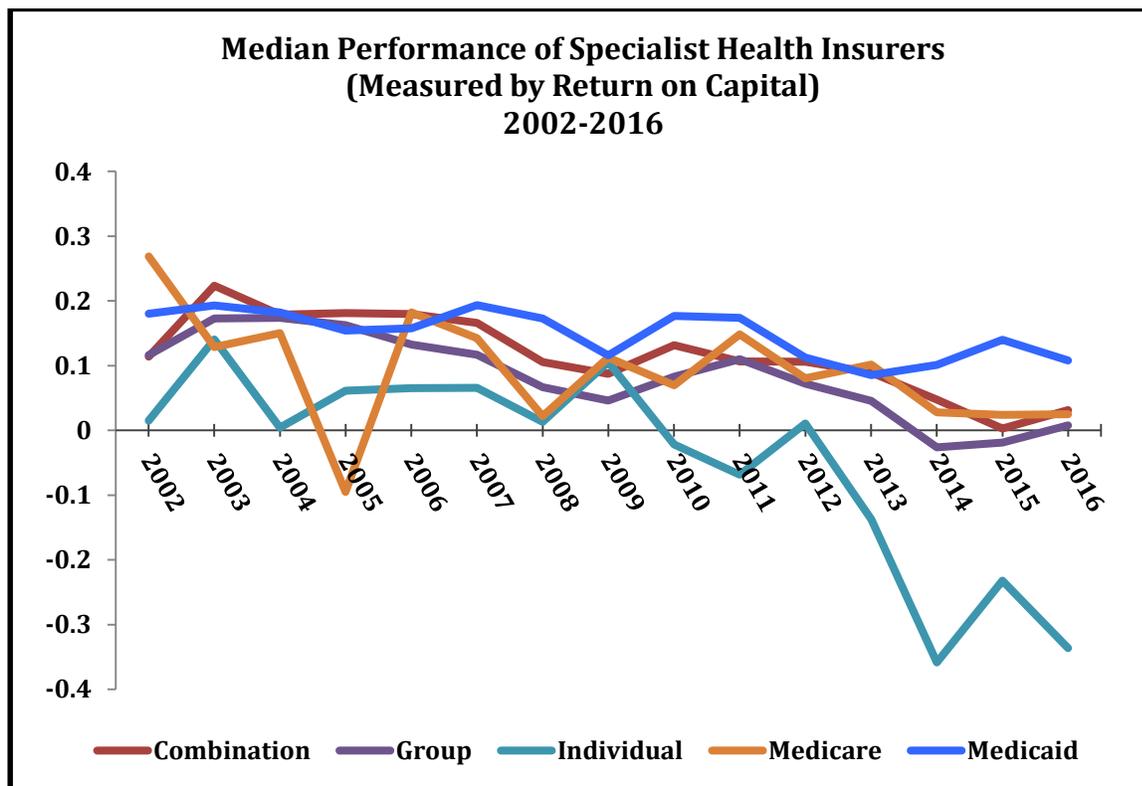
During the health care debate to “repeal and replace” the ACA, efforts to cut Medicaid took center stage. Shaped primarily by political ideology, the Better Healthcare Reconciliation Act (BCRA) and its subsequent iterations failed, in part, because of opposition to Medicaid cuts. This episode in the ongoing effort to reform the US healthcare system highlighted the success of the ACA’s Medicaid expansion.

Our discovery of the superior performance of Medicaid specialty insurers suggests that ACA’s Medicaid expansions’ success may be the result of greater efficiencies within the Medicaid market, which predate the ACA. That Medicaid specialists’ profits increase when hospitalizations increase, further reinforces the idea that something is different about the Medicaid insurance market. Similar result of hospital days vs. performance for the Medicare specialist insurer may indicate some important elements with the governmental health care programs that are worth more research. Medicare specialists, however, are not performing well relative to the Medicaid specialists. We can speculate that the age of the Medicare population contributes to this disparity. Nevertheless, the insights this study reveals about the positive relationship between the volume of days in the hospital and profits for the governmental programs specialists is significant. As policymakers continue to search for ways to improve the US healthcare system our findings indicate a potential model of efficiency and viability may

already exist within the current system. Seeing the Medicaid and Medicare specialists are able to profit from more days in the hospital, while the insurers specializing in Group coverage experience the opposite, hints at the future potential of private-public alliances in the US healthcare system.

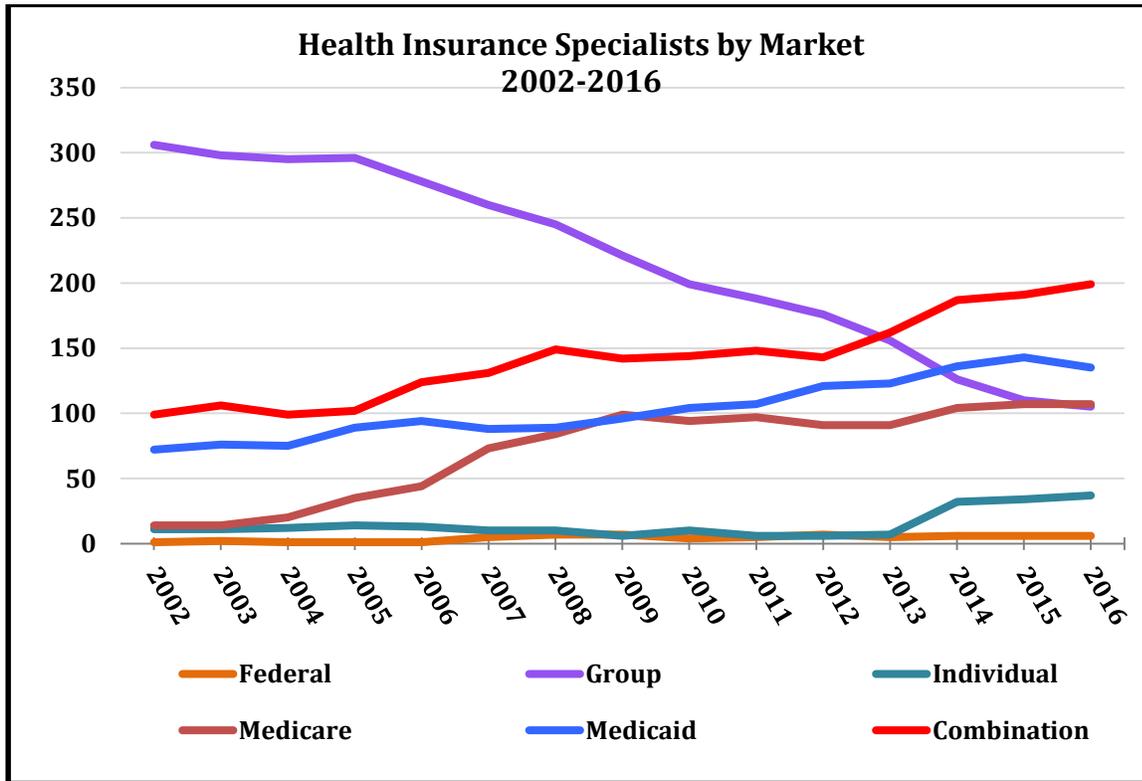
## Charts and Tables

### Exhibit 1



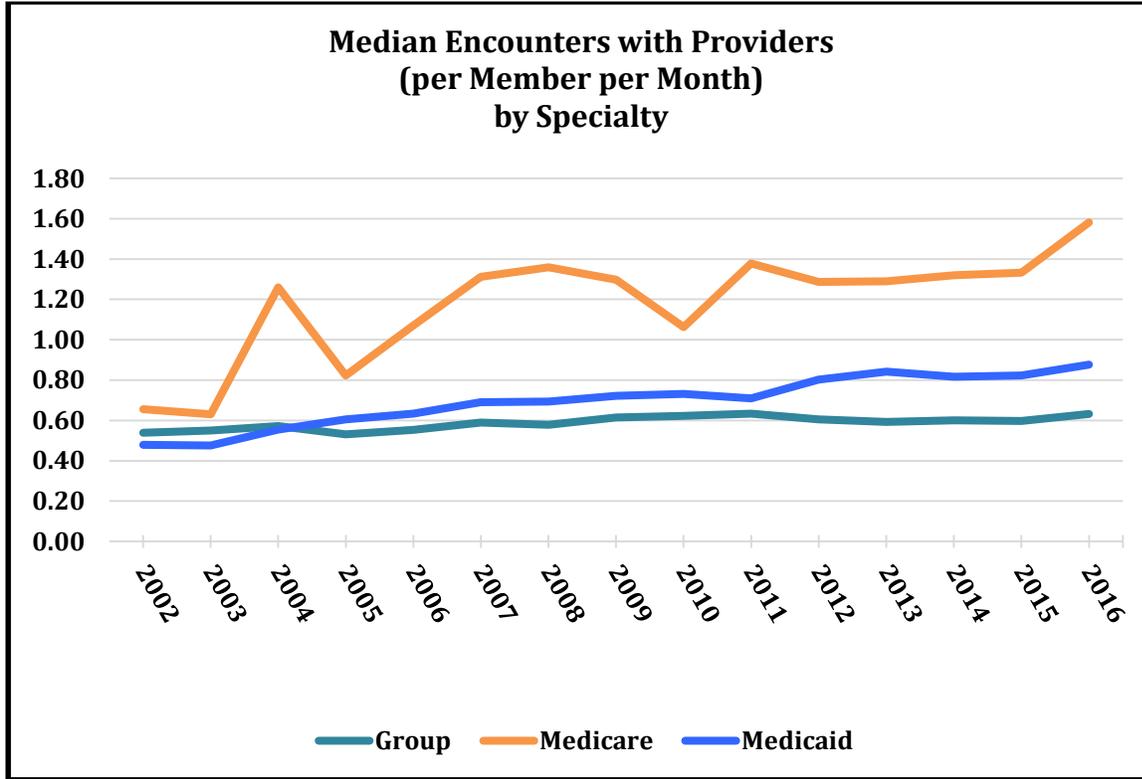
Source: Original analysis of data by the authors. NAIC Insurance Data Products. Annual Health InfoPro Data Sets, 2002-2016.

**Exhibit 2**



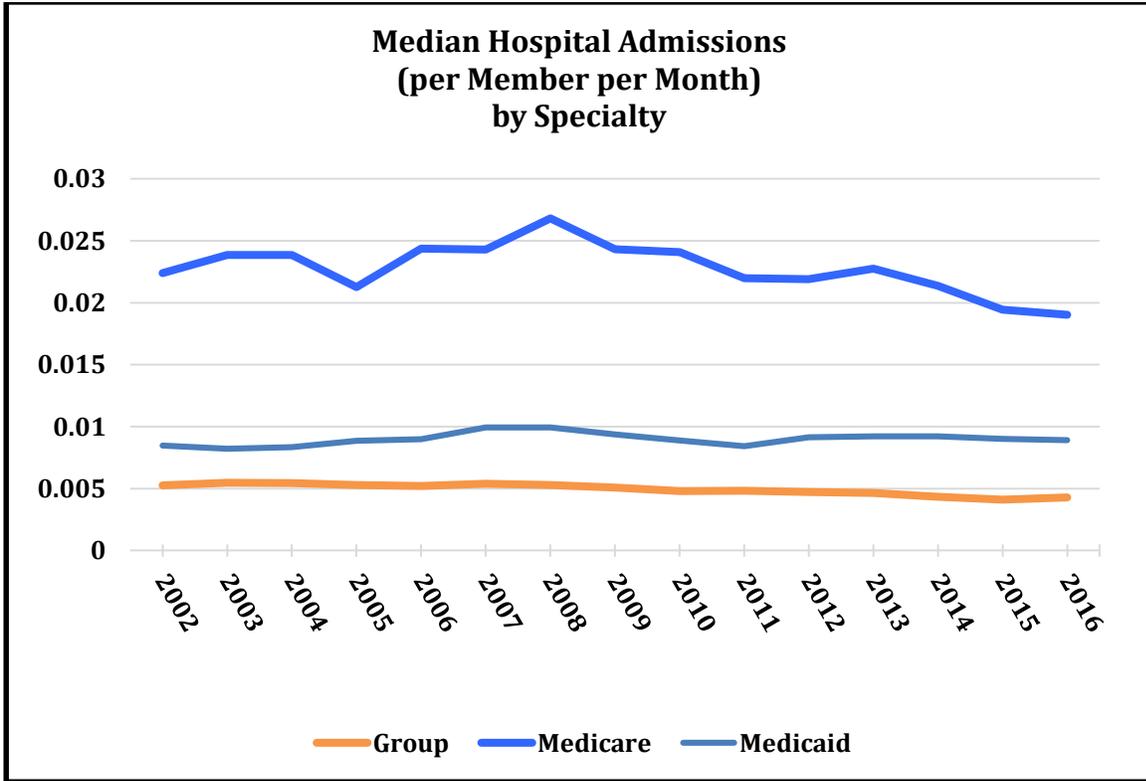
Source: Original analysis of data by the authors. NAIC Insurance Data Products. Annual Health InfoPro Data Sets, 2002-2016.

**Exhibit 3**



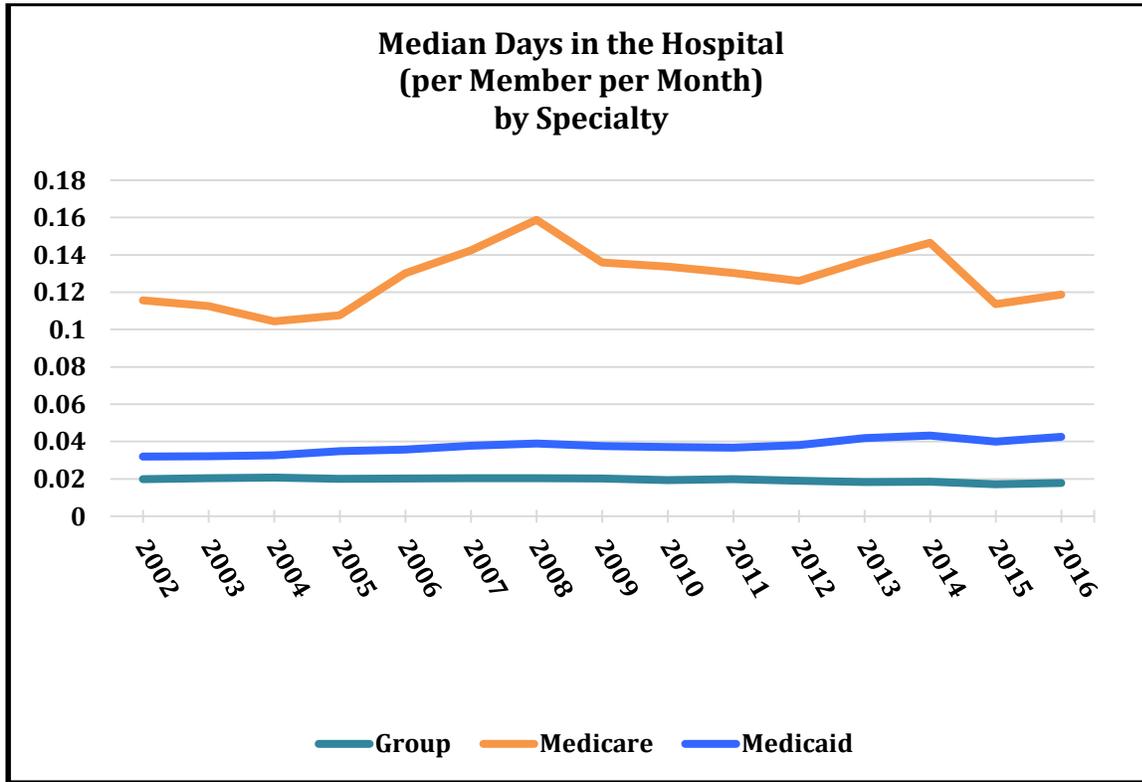
Source: Original analysis of data by the authors. NAIC Insurance Data Products. Annual Health InfoPro Data Sets, 2002-2016.

**Exhibit 4**



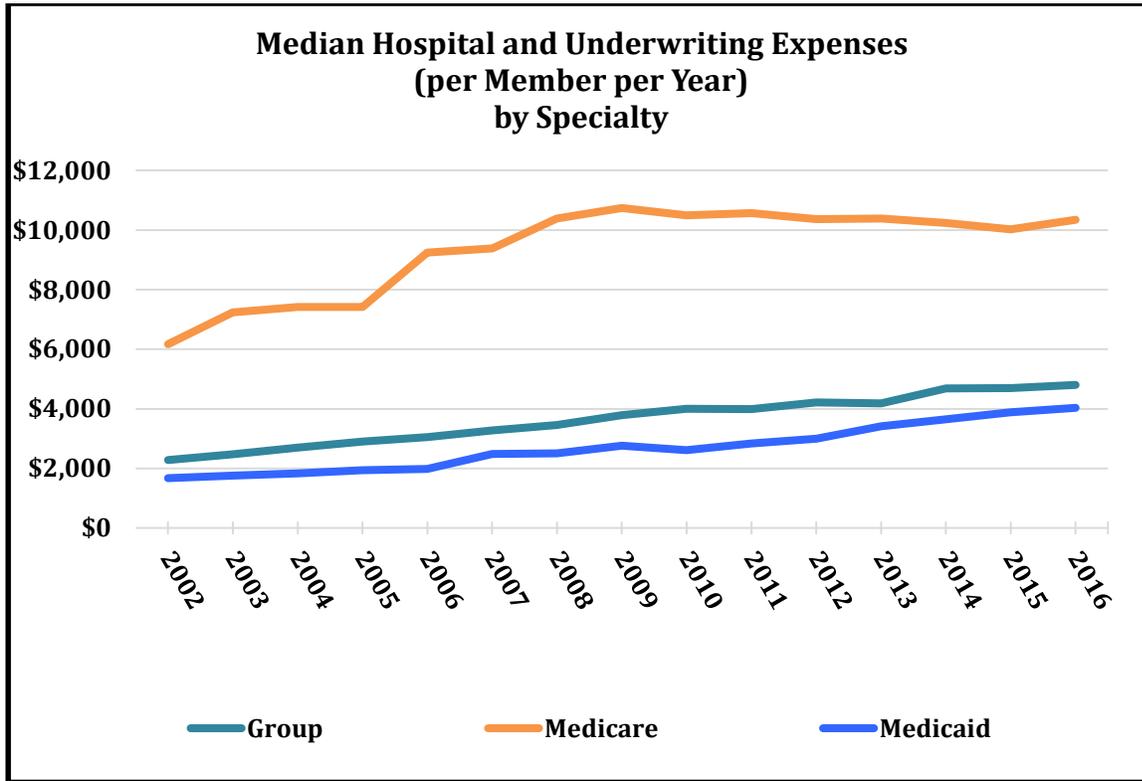
Source: Original analysis of data by the authors. NAIC Insurance Data Products. Annual Health InfoPro Data Sets, 2002-2016.

**Exhibit 5**



Source: Original analysis of data by the authors. NAIC Insurance Data Products. Annual Health InfoPro Data Sets, 2002-2016.

**Exhibit 6**



Source: Original analysis of data by the authors. NAIC Insurance Data Products. Annual Health InfoPro Data Sets, 2002-2016

## Exhibit 7

Comparison of Specialist Performance Results by Time Periods								
Analysis Of GEE Parameter Estimates								
Parameter	2002-2016		2011-2016		2007-2010		2002-2006	
	Estimate	Pr >  Z						
<b>Intercept</b>	-1.9033	<.0001	-2.4121	<.0001	-0.7293	0.0012	-1.5648	<.0001
<b>Size</b>	0.0895	<.0001	0.1004	<.0001	0.0968	<.0001	0.0897	<.0001
<b>CAP</b>	0.9662	<.0001	1.1715	<.0001	0.7708	<.0001	0.7225	<.0001
<b>Pstock</b>	-0.3743	<.0001	-0.3857	<.0001	-0.3833	<.0001	-0.3730	<.0001
<b>NGroup</b>	-0.0502	0.0228	-0.0405	0.1903	-0.0752	0.0117	-0.0593	0.0252
<b>NType</b>	0.0904	<.0001	0.1340	<.0001	0.0463	0.0466	0.0443	0.0670
<b>AllComBusMLR</b>	-0.2137	0.1894	-0.1108	0.4043	-1.5417	<.0001	-0.2733	0.0794
<b>Group Specialty</b>	0.0238	0.1204	0.0198	0.4018	-0.0207	0.2740	-0.0123	0.5932
<b>Medicare Specialty</b>	-0.0612	0.0312	-0.0249	0.4887	-0.0216	0.5680	-0.0519	0.4817
<b>Medicaid Specialty</b>	0.0559	0.0088	0.0463	0.0911	0.0704	0.0066	0.0471	0.1625
<b>Individual Specialty</b>	-0.1856	0.0075	-0.2862	0.0010	-0.1332	0.1592	-0.0160	0.8921

Dependent variable:  $RetOnCap = NetIncome / Total\ Actual\ capital$

Size =  $mean(\log(assets), \log(Liabilities), \log(Premium\ Income))$

CAP =  $Capital\ (equity) / Total\ Assets$

Pstock =  $Investment\ in\ stocks\ (equities) / Assets$

if insurer is part of a group, then NGroup = 1, otherwise NGroup = 0

if insurer is a stock company, not mutual insurer, then NType = 1, otherwise NType = 0

AllComBusMLR = Total Comprehensive health business Medical Loss Ratio

if insurer is Group Specialty, then Group Specialty = 1, otherwise Group Specialty = 0

if insurer is Medicare Specialty, then Medicare Specialty = 1, otherwise Medicare Specialty = 0

if insurer is Medicaid Specialty, then Medicaid Specialty = 1, otherwise Medicaid Specialty = 0

if insurer is Individual Specialty, then Individual Specialty = 1, otherwise Individual Specialty = 0

Source: Original Analysis by the authors.

Model estimation uses the GEE methodology (generalized estimating equations).

GEE corrects violation of standard regression assumptions. (complete analysis is available upon request)

## Exhibit 8

<b>Performance Results for Specialists</b> <b>(with Utilizations per Member per Month and Expenses per Member</b> <b>Annually per Specialist as Control Variables)</b> <b>2011-2016</b> <b>Analysis Of GEE Parameter Estimates</b>								
Group			Medicaid			Medicare		
Parameter	Estimate	Pr >  Z	Parameter	Estimate	Pr >  Z	Parameter	Estimate	Pr >  Z
Intercept	-2.2227	<.0001	Intercept	-1.2211	0.0177	Intercept	-4.6249	<.0001
Size	0.0865	<.0001	Size	0.0690	0.0002	Size	0.1940	<.0001
CAP	1.1093	<.0001	CAP	0.9779	<.0001	CAP	1.6442	<.0001
Pstock	-0.3992	<.0001	Pstock	-0.4972	0.0072	Pstock	-0.9242	0.0010
RBCratio	0.0000	0.1162	RBCratio	0.0003	0.0120	RBCratio	-0.0001	0.0407
Tstates	-0.0001	0.9457	Tstates	-0.0048	0.0532	Tstates	-0.0076	<.0001
NGroup	-0.0765	0.0880	NGroup	0.0537	0.2988	NGroup	-0.0187	0.8255
NType	0.1210	0.0022	NType	-0.0567	0.2609	NType	0.2034	0.0767
Encounters (Group)	-0.0683	0.0771	Encounters (Medicaid)	-0.0018	0.9297	Encounters (Medicare)	-0.0391	0.1502
Days in the Hospital (Group)	-2.0648	0.1889	Days in the Hospital (Medicaid)	0.0988	0.2064	Days in the Hospital (Medicare)	0.0559	0.0725
Admission to Hospital (Group)	23.7483	0.1610	Admission to Hospital (Medicaid)	-0.4716	0.3702	Admission to Hospital (Medicare)	1.1382	0.3422
Hospital and Underwriting Expenses (Group)	-0.0000011	0.3523	Hospital and Underwriting Expenses (Medicaid)	-0.0000078	0.2253	Hospital and Underwriting Expenses (Medicare)	-0.0000108	0.3036
Group members from 70-100%	0.0563	0.7604	Medicaid members from 70-100%	-0.5276	0.0087	Medicare members from 70-100%	0.3367	0.2176

Dependent variable:  $\text{RetOnCap} = \text{NetIncome} / \text{Total Actual capital}$

Size =  $\text{mean}(\log(\text{assets}), \log(\text{Liabilities}), \log(\text{Premium Income}))$

CAP =  $\text{Capital (equity)} / \text{Total Assets}$

Pstock =  $\text{Investment in stocks (equities)} / \text{Total Assets}$

Risk Based capital Ratio =  $100 * (\text{Risk based capital computed based on regulatory formula}) / (2 * \text{Actual Capital})$

Tstates = the number of states of the insurer operation

if insurer is part of a group of companies, then NGroup = 1, otherwise NGroup = 0

if insurer is a stock company rather than a mutual insurer, then NType = 1, otherwise NType = 0

Source: Original Analysis by the authors.

Model estimation uses the GEE methodology (generalized estimating equations).

GEE corrects violation of standard regression assumptions. (complete analysis is available upon request)

**Exhibit 9**

<p align="center"><b>Performance Results for Specialists</b>  <b>(with Utilizations per Member per Month and Expenses per Member Annually per Specialist as Control Variables)</b>  <b>2002-2016</b>  <b>Analysis Of GEE Parameter Estimates</b></p>								
Group			Medicaid			Medicare		
Parameter	Estimate	Pr >  Z	Parameter	Estimate	Pr >  Z	Parameter	Estimate	Pr >  Z
Intercept	-2.0301	<.0001	Intercept	-1.0583	0.0003	Intercept	-3.6675	<.0001
Size	0.0876	<.0001	Size	0.0635	<.0001	Size	0.1758	<.0001
CAP	1.0656	<.0001	CAP	0.8108	<.0001	CAP	1.2340	<.0001
Pstock	-0.4445	<.0001	Pstock	-0.1004	0.5643	Pstock	-0.8501	<.0001
RBCratio	-0.0001	0.0317	RBCratio	0.0002	0.0370	RBCratio	-0.0001	0.0153
Tstates	-0.0009	0.6577	Tstates	-0.0041	0.0509	Tstates	-0.0057	0.0003
NGroup	-0.0236	0.3531	NGroup	-0.0764	0.0174	NGroup	-0.0115	0.8609
NType	0.0795	0.0016	NType	0.0148	0.6708	NType	0.0691	0.5158
Encounters (Group)	-0.0265	0.0247	Encounters (Medicaid)	-0.0051	0.7444	Encounters (Medicare)	-0.0256	0.2242
Days in Hospital (Group)	-1.1338	0.0627	Days in Hospital (Medicaid)	0.1076	0.0515	Days in Hospital (Medicare)	0.0535	0.0502
Admission to Hospital (Group)	3.8922	0.1256	Admission to Hospital (Medicaid)	-0.2830	0.6004	Admission to Hospital (Medicare)	0.1292	0.7956
Hospital and Underwriting Expenses (Group)	-0.00000278	0.1782	Hospital and Underwriting Expenses (Medicaid)	-0.0000157	<.0001	Hospital and Underwriting Expenses (Medicare)	-0.0000164	0.0299
Group members from 70-100%	-0.0120	0.9002	Medicaid members from 70-100%	-0.3462	0.0157	Medicare members from 70-100%	0.1451	0.5860

Dependent variable:  $RetOnCap = NetIncome / Total Actual capital$

Size =  $mean(\log(assets), \log(Liabilities), \log(Premium Income))$

CAP =  $Capital (equity) / Total Assets$

Pstock =  $Investment in stocks (equities) / Total Assets$

Risk Based capital Ratio =  $100 * (Risk based capital computed based on regulatory formula) / (2 * Actual Capital)$

Tstates = the number of states of the insurer operation

if insurer is part of a group of companies, then NGroup = 1, otherwise NGroup = 0

if insurer is a stock company rather than a mutual insurer, then NType = 1, otherwise NType = 0

Source: Original Analysis by the authors.

Model estimation uses the GEE methodology (generalized estimating equations).

GEE corrects violation of standard regression assumptions. (complete analysis is available upon request)

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