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Cassandra Cole and Kathleen McCullough  
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## **Commercial Insurers' Participation in Public Health Insurance Programs**

*Patricia Born, Ph.D.*

*J. Bradley Karl, Ph.D.*

*Kathleen McCullough, Ph.D.*



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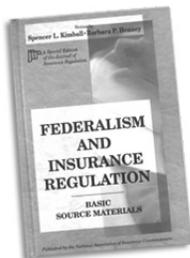
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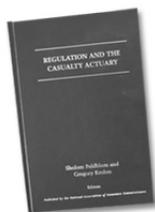
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# Commercial Insurers' Participation in Public Health Insurance Programs

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Kathleen McCullough, Ph.D.\*

J. Bradley Karl, Ph.D.\*\*

Patricia Born, Ph.D.\*\*\*

## Abstract

For many years, commercial insurers have opted in and out of the provision of health care services to persons enrolled in public programs, such as Medicare and Medicaid. By mandating the creation of health insurance exchanges, the federal Patient Protection and Affordable Care Act of 2010 (ACA) offers a new way for commercial insurers to participate in public health programs. Participation is not mandatory, and thus will require that participating insurers be allowed to establish adequate premiums to ensure solvency. Our analysis sheds light on the potential benefit of participating in a health insurance exchange by analyzing the relative performance of commercial health insurers across varying degrees of participation in public health insurance programs. In particular, we consider how the level of participation in Medicare, Medicaid and the Federal Employee Health Benefits Program relate to commercial health insurers' overall financial performance. Our results show that insurers' underwriting performance is weakly related to the degree to which they concentrate in various lines of public insurance. While performance is not significantly enhanced, it is also not significantly worsened by participating in public health insurance programs. This information may be especially useful to state insurance regulators as they evaluate the performance of the private insurance market and participation in health insurance exchanges across rating areas in their states.

\* Department of Risk Management/Insurance, Real Estate and Legal Studies, College of Business, Florida State University, 821 Academic Way, P.O. Box 3061110, Tallahassee FL 32306-1110; [kmccullough@business.fsu.edu](mailto:kmccullough@business.fsu.edu).

\*\* East Carolina University, Department of Finance, Bate Building 3129, Greenville NC 27858; [karlj@ecu.edu](mailto:karlj@ecu.edu).

\*\*\* Department of Risk Management/Insurance, Real Estate and Legal Studies, College of Business, Florida State University, 821 Academic Way, P.O. Box 3061110, Tallahassee FL 32306-1110; [pborn@business.fsu.edu](mailto:pborn@business.fsu.edu).

## 1. Introduction

The enactment of the federal Patient Protection and Affordable Care Act of 2010 (ACA) initiated unprecedented changes in the U.S. health insurance market. Among the most relevant changes are subsidies to small groups for the purchase of health insurance, an individual mandate to purchase coverage, mandated benefits, the creation of health insurance exchanges and expanded Medicaid eligibility. While potentially costly to U.S. taxpayers, the reform measures could significantly affect the availability and affordability of health care services and ultimately “transform U.S. health insurance.”<sup>1</sup> However, there is little empirical information predicting the potential long-term effects of this new federal regulation, especially as it relates to the operations of health insurers.

One of the many consequences of the regulations imposed by the ACA is that it will alter the nature of private insurers’ participation in public health insurance programs, which will ultimately have consequences for the nature of regulatory constraints on health insurers. As mandated by the ACA, public health insurance exchanges create a new market in which “Americans can one-stop shop for a health care plan, compare benefits and prices, and choose the plan that’s best for them”<sup>2</sup> and policies sold on the exchanges are subject to different types of federal and state regulatory constraints when compared to policies sold on the market before the enactment of the ACA. Similarly, health insurers commencing or increasing participation in the Medicaid program, due to the Medicaid expansion provisions of the ACA, are faced with new regulatory constraints relative to pre-ACA levels. As insurers are faced with new costs of participation, it is important for state insurance regulators and other market participants in the post-ACA era to understand how participation in public programs influences the performance of health insurers, because successful performance (i.e., profitability) will drive participation.

Our research examines how participation in public health insurance programs is related to health insurer performance in the period before the enactment of the ACA. Relative to other lines of health insurance business, participation in the public health insurance programs—Medicare, Medicaid and the Federal Employee Health Benefits Program (FEHBP)—imposed unique regulatory constraints on private health insurers in the pre-ACA era. While the regulations associated with Medicare, Medicaid and the FEHBP do not perfectly reflect those that will be encountered by health insurers in the post-ACA era, examining insurers’ success within the regulatory confines of these public programs may shed light on insurers’ financial performance as they adapt to the regulatory confines of the ACA. If the health insurers that choose to participate have (or have not) found

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1. Harrington (2010), p. 34.

2. Statement made by President Barak Obama in the post titled, “President Obama Reiterates Support for Public Option and Health Insurance Exchange” and found at: <http://my.barackobama.com/page/community/post/obamaforamerica/gGGGpK>. Last accessed May 7, 2012.

ways to be operationally successful in the pre-ACA era while participating in public health insurance programs, this would provide some evidence that health insurers will (or will not) be able to overcome the unique regulatory constraints they encounter when participating in health insurance exchange business and Medicaid business in the post-ACA era.

Our results indicate that a non-trivial relationship exists between the financial performance of commercial health insurers and their level of involvement in public health insurance programs. We provide evidence that the cross-sectional relationship between participation in public health insurance programs and several measures of operational performance varies depending on the type of program and the measure of operating performance.

The remainder of our paper is organized as follows. In Section 2, we examine the relevant literature addressing the performance of commercial health insurers, factors related to their participation in public health insurance programs, and the financial performance in these public programs. In Section 3, we discuss our data and develop testable hypotheses regarding the relationship between insurer performance and participation in private and public health insurance programs. Section 4 provides an overview of our data and methodology. We then present and discuss our results in Section 5, and we provide our conclusion in Section 6.

## 2. Background

Our research draws from multiple streams of literature. We refer, specifically, to a wide range of health economics and health policy literature that addresses the financial performance of managed care plans and a number of studies that address the financial performance of insurers more generally.<sup>3</sup> To a great extent, the former body of research was motivated initially by the transition in the U.S. from indemnity coverage to primarily managed care, and has been largely concerned with availability of health care services, health outcomes and/or quality of care. These studies draw primarily on data from the health care industry (e.g., hospitals) and consumer surveys. An overarching objective for much of this literature has been to gain a better understanding of factors driving the cost of health care. In the 1980s and 1990s, newly formed managed care plans were scrutinized for their ability to contain costs without impacting the quality of care provided. One early focus of research on commercial health insurers' financial performance was driven by concerns that the incentives associated with operating a "for profit" managed care plan would result in the coverage of fewer services or lower quality care.<sup>4</sup> As the managed care market continued to grow, research addressing their financial performance expanded to other topics, including the costs and benefits of

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3. We refer to the organizations providing health insurance as health insurers, which include managed care organizations (e.g., HMOs, PPOs) as a common form.

4. See, for example, Schlesinger et al. (1986) and Bryce (1994).

consolidation,<sup>5</sup> competition<sup>6</sup> and the role of medical technology.<sup>7</sup> Many of these studies relied on state aggregate data because a central depository for insurer-level data did not exist.<sup>8</sup>

### *Public and Private Health Insurance Business*

Commercial health insurers' private lines of insurance business include comprehensive hospital and medical services, vision, dental, long-term care and disability income. These insurers also have a long history of involvement in public programs; for decades, they have served as risk-bearing entities in the FEHBP, and more recently as capitated, risk-bearing entities in Medicare Choice (now Medicare Advantage) and Medicaid. Table 1 shows a summary of the three main public programs in which commercial health insurers, now predominantly managed care plans, currently report their participation.<sup>9</sup> We also include, in Table 1, Medicare supplement plans, which are heavily regulated and inherently linked to the Medicare program, but provided solely through a competitive market of commercial insurers, who bear all of the risk associated with the coverage. To our knowledge, no study has evaluated the financial performance of commercial health insurers that participate to varying degrees in these programs simultaneously. Nevertheless, the research addressing commercial health insurers' performance in public programs is broad and considers, among other things, their decisions to participate,<sup>10</sup> capture and spillover of enrollees,<sup>11</sup> uncompensated care,<sup>12</sup> outcomes and financial performance.

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5. Robinson (2004) finds a weak correlation between the structure of the industry and its long-term profitability.

6. For example, studies such as Dafny (2010), Dafny et al. (2012) and Scanlon et al. (2006) consider the relationship between health insurance market structure and performance.

7. Advances in medical technology have been linked to premium increases in several studies. While these advances are considered beneficial for the improvement in health outcomes, these advances come at a cost (Cutler and McClellan (2001); Newhouse (1992); Bunker et al. (1994)). To remain financially viable, health insurers must pass these costs through to consumers, resulting in higher health insurance premiums, which lead to a reduction in coverage rates (Chernew et al. (2005)).

8. Plan-level financial data were available from a variety of sources, such as the National Committee on Quality Assurance (NCQA) and state insurance or health departments, but is only recently available on a more comprehensive plan-level basis, across all plans and all states.

9. We focus on this categorization of these programs to be consistent with the data reported to the state insurance departments, which we use in our analysis. Financial performance of the programs within these categories; e.g., those enrolled in Medicare via TRICARE, is not available.

10. See, for example, Robinson (2006).

11. For example, Cutler and Gruber (1996) analyze the effects the expansions of Medicaid to pregnant women and children between 1987 and 1992. The authors estimate the decline in private coverage as a result of the expansion was roughly 50%. In the following decade, Gruber and Simon (2008) estimate an even larger crowd-out rate of about 60%.

**Table 1:  
U.S. Commercial Health Insurers' Participation in  
Public Health Insurance Programs**

<b>Program</b>	<b>Role of Commercial Insurers</b>
Medicare (Title XVIII) Established 1965	<ul style="list-style-type: none"> <li>• In the traditional program, commercial insurers contract with the federal government to handle claims, administration, etc.</li> <li>• Commercial insurers bear risk in Medicare Choice implemented in 1997; now known as Medicare Advantage</li> </ul>
Medicaid (Title XIX) Established 1965	<ul style="list-style-type: none"> <li>• Depends on state. Some states subcontract to commercial insurers, other states pay providers directly.</li> <li>• Offered through managed care plans since the 1990s, via waivers from the federal government. Commercial insurers handle claims, administration, etc.</li> </ul>
Federal Employee Health Benefits Program (FEHBP) Established 1959 [Includes TRICARE (formerly CHAMPUS), established 1966]	<ul style="list-style-type: none"> <li>• Commercial insurers compete with government plans.</li> <li>• Original legislation required the program to offer HMOs.</li> </ul>
Medicare Supplement First plan appeared 1971 Standardized in 1991	<ul style="list-style-type: none"> <li>• Commercial insurers provide several different standardized coverage options. Reduced to 12 plans in 1992.</li> <li>• Three states (Massachusetts, Minnesota and Wisconsin) offer nonstandard plans.</li> <li>• Commercial insurers offer managed care coverage via Medicare Select; piloted in 15 states, expanded to all 50 states in 1995.</li> </ul>

The participation of commercial plans in the public programs has important implications for public policy, including the establishment of program parameters that allow plans to achieve cost savings and minimize the potential disruption to enrollees due to the entry and exit of plans. Empirical research supports economic theories that suggest insurers enter markets in which they expect positive profits and exit when this goal is not achieved. But expected profitability, which requires adequate reimbursement rates, is not the sole driving factor. In a study of participation in Medicaid managed care, Coughlin et al. (2001) find that rate adequacy is a central factor; however, some noneconomic factors, such as a sense of social obligation or brand image, are also relevant to an insurer's decision to participate. In an analysis of trends from 1993 to 1995, Felt-Lisk and Yang (1997) note that "plans serving Medicaid tended to be either Medicaid-dominated or low-Medicaid." Using data from InterStudy, Long and Yemane (2005) evaluate the factors associated with commercial insurers' decisions to exit the Medicaid managed care market. Their findings suggest that the states wishing to maintain participation by commercial insurers must pay sound capitation rates and consider their mandatory enrollment rules.

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12. See Stoll (2005), Dobson et al. (2006) and Hadley et al. (2008). Stoll (2005) estimates that the impact of uncompensated care through cost shifting adds \$922 to the annual premium charged for family health insurance coverage.

Before the Medicare program was established, commercial insurers had little opportunity to earn profits in the older population (age 65 and older). Jones (1996) examines the commercial insurance market opportunities created by the Medicare program. While few insurers chose to market to the elderly before Medicare, they did find it profitable to write Medicare supplement policies, which represented much less risk (Jones (1996)). The Medicare program administration was authorized to contract with health maintenance organizations (HMOs) on a capitated basis under the 1972 Social Security amendments, but by 1979, only one plan had contracted with Medicare on a risk basis (Oberlander (1997)). Demonstration projects and other provisions, including the federal Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) promoted the involvement of commercial insurers by offering favorable prospective, monthly capitated payments. The 1980s and 1990s included multiple attempts to move enrollees into managed care, under the assumption that managed care could provide medical care at a substantially lower cost than the traditional indemnity plans.<sup>13</sup>

Ellis and Gurol (2004) evaluate health plan entry and exit from the Medicare managed care market over the period 1997–2001. They find that Medicare prices are important, but regulations and other non-price factors also help to explain trends in participation during this time period. Most important, this study disentangles the entry and exit of plans from the Medicare program from the entry and exit of plans from the commercial market.

The FEHBP offers a wide range of coverage options to federal employees and retirees. The number of plans in the program varies from year to year, but has historically included traditional indemnity plans and managed care plans.<sup>14</sup> When the program began operation in 1960, it offered 28 plans. There are currently 230 different plan choices, including 14 nationwide fee-for-service plans, but more than half the enrollees are enrolled in Blue Cross and Blue Shield and another 25% are in one of the other national preferred provider organization (PPO)/fee-for-service plans.<sup>15</sup> Much of the research on the FEHBP has utilized enrollment information to evaluate health insurance consumer behavior; e.g., response to copayments, tendency to switch plans, effect of report cards, etc.<sup>16</sup> Research addressing the financial performance of the insurers participating in the FEHBP is limited.

The U.S. Office of Personnel Management (OPM), which administers the FEHBP, negotiates directly with commercial plan carriers to establish rates and benefits. Over its history, plans have left the program due to inadequate rates and

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13. See Miller and Luft (1994) for arguments supporting this view.

14. Enthoven (1989) provides a discussion of biased selection and lack of efficiency in the FEHBP. He concludes with a number of recommendations “from the point of view of a rational economic design to achieve the efficient and equitable program that taxpayers and federal employees are paying for,” including standardizing benefit packages and integrating the program with Medicare.

15. See Mach (2012).

16. See, for example, Wedig and Tai-Seale (2002) and Atherly et al. (2005).

adverse selection problems that arise from the wide range of plans offered.<sup>17</sup> The OPM is currently looking to expand nationwide the number of HMOs available in the program. According to its announcement, the OPM is hoping that health insurance carriers will be interested in either applying or reapplying for participation under the new pricing method dictated by the introduction of the medical loss ratio (MLR) regulations in the ACA. The previous method was based on similarly sized subscriber groups. Further, the announcement indicates a priority for adding plans in the states that have been determined to be medically underserved.<sup>18</sup>

Insurers that sell Medicare supplement coverage can offer up to 10 model policies. The core benefits included in all policies include coverage for: 1) copayments for Part A hospital stays for days 61 through 150; 2) the 20% coinsurance for Part B physician charges; 3) the first three pints of blood received each year; and 4) an additional 365 days of hospital care. Because the coverage effectively removes the cost-sharing mechanisms from the traditional Medicare program, much research has emphasized how supplemental coverage induces a moral hazard problem, effectively creating first-dollar coverage and thereby increasing utilization in the Medicare program.<sup>19</sup>

### *Participation Decisions*

The existing literature considers our assumption that commercial insurers that participate in the public health insurance programs maintain their participation if they are financially viable and exit if their profitability is threatened. We do not seek here to evaluate the reasons for entry and exit into these markets; instead, we assume that entry is likely driven by an assumption of positive financial opportunities. Similarly, exit may be desirable when the line of business is unprofitable. However, we do not assume that participation is necessarily a profitable move when evaluated solely on the performance in that new line. Specifically, entering one or more public lines of insurance may yield benefits that spill over to the private lines of coverage through, for example, increased negotiating power over provider organizations. Thus, we focus our analysis on how participation in one or more of these public lines of insurance are related to the performance of the insurer as a whole.

Despite the large number of commercial insurers that operate exclusively, or almost exclusively, within these government programs, we consider the primary function of commercial plans to be that of providing private health insurance

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17. Aetna withdrew in 1990 because adverse selection threatened its financial performance (National Health Policy Forum (1998)).

18. The U.S. Department of Health and Human Services lists the following medically underserved states: Alabama; Arizona; Idaho; Illinois; Louisiana; Mississippi; Missouri; Montana; New Mexico; North Dakota; Oklahoma; South Carolina; South Dakota; and Wyoming.

19. For studies of the effect of Medicare supplement policies on the Medicare program see McCall et al. (1991), Marquis (1992) and Atherly (2002).

coverage. This coverage is primarily comprehensive medical insurance, but commercial insurers also offer dental, disability, vision and long-term care insurance in the private market.

The commercial health insurance industry is threatened by several trends, including, most important, the decline in the employment-based provision of health insurance (Robinson (2006)). This decline has encouraged commercial insurers to diversify into public programs, thereby allowing for further growth and serving to limit their exposure to risk in any one particular program. Robinson (2006) notes, for example, “the ‘single-payer’ structure of state Medicaid programs no longer constitutes an insurmountable barrier to investor-owned insurers, as they can enter and exit particular states based on changes in payment rates and medical costs.” While he addresses the important factors driving commercial insurers into participation in the public programs, he does not test whether participation in these programs has yielded a positive financial benefit to commercial insurers.

Few papers to date have assessed whether diversification benefits exist for health insurers that operate in different lines. One exception is a recent paper by McCue and Bailit (2011), in which the authors explore the financial performance and quality differences for three types of plans: 1) “pure-play,” publicly traded plans that focus almost exclusively on the Medicaid business; 2) multiproduct, publicly traded plans; and 3) provider-sponsored plans. They find, among other things, that pure-play, publicly traded plans had lower medical costs associated with serving the Medicaid population when compared to non-publicly traded plans. While the multiproduct plans did not report significantly different financial performance from the other types of plans, they were found to report higher administrative costs.

While it may be early to assess whether insurer participation in the exchanges is rewarding, several empirical studies yield some early insight into the participation decision. For example, insurers’ decisions to participate in an exchange depend on their ability to attract an adequate pool of insureds within a given rating area. Dickstein et al. (2015) suggest that more insurers will enter rating areas if rural areas are combined with neighboring urban markets. McGuire et al. (2014) apply a model of plan profit maximization, recognizing the potential for adverse selection, and conclude that plans have incentives to skimp on care for certain diagnoses. Dafny et al. (2014) evaluate the initial (2011) plan participation across rating areas in the states with federally funded exchanges and conclude that more plans equates to lower premiums in the exchange. They further conclude that the new exchange markets exhibit the same competitive dynamics of existing, mature health insurance markets where neither is perfectly competitive.

### *Other Factors Affecting Performance*

In the analysis that follows, our comprehensive data set provides us with a unique opportunity to examine insurers’ participation in multiple lines of business, while controlling for other insurer characteristics and a variety of intervening

factors. Variation in the profitability of commercial insurers reflects not only their choice to participate in various public and private lines of business, but also their success in the design of contracts, charging appropriate premiums and, subsequently, managing the services provided. Therefore, to the extent that similarities exist between participation in public programs and participation in exchanges, this paper endeavors to provide insight into the influence of the ACA on health insurers' financial operations.

One exogenous factor affecting this success is the demographic characteristics of the population served. While there is an extensive literature that links disparities in insurance coverage to demographic characteristics,<sup>20</sup> only a few papers have tied health insurer operations and performance to characteristics of the population served. For example, Bundorf (2002) examines the relationship between employee preference for health insurance and the health plans offered by employers and finds that employee characteristics affect the generosity of health plans offered by employers. Bundorf, Herring and Pauly (2010) find that adverse selection in the group insurance market is affected by the socio-economic status of the insureds. More recently, several studies have analyzed state-specific factors that will likely influence the operation of health insurance exchanges, or have affected their development thus far. For example, a recent report from the Urban Institute notes how the presence of either a dominant insurer, or a dominant hospital system, will affect the nature of competition in the market (Holahan (2012)). Graves and Swartz (2013) suggest that enrollment in health insurance exchanges and Medicaid expansion programs will depend, in part, on statewide factors that cause people to become uninsured. The authors conclude that the states will need to tailor their outreach and retention efforts toward specific populations. Some studies have looked to the Massachusetts exchange (Health Connector) for guidance on likely consumer responses (Starc and Kolstad (2012); Ericson and Starc (2012)). Based on a survey of enrollees in the Massachusetts Health Connector, Sinaiko et al. (2013) conclude that exchanges will need to provide adequate resources and decision support tools to enable enrollees to optimize their health plan choices. These latter findings have important implications for ensuring the viability of exchanges and encouraging the involvement of insurers who may fear adverse selection.

Additional studies help identify other exogenous factors that may play an important role in insurer profitability more generally. Such studies generally concur that certain economic factors are related to insurer performance. For example, Browne, Carson and Hoyt (1999) identify factors that are exogenous to individual life/health insurers and related to insurer insolvency. Their results indicate that long-term interest rates, personal income, unemployment, the stock market, number of insurers and real estate returns are all related to the solvency of life and health insurers.

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20. See, for example, Gresenz et al. (2009), Alegria et al. (2006), and Monheit and Vistnes (2000).

Prior research indicates that some additional insurer-specific characteristics are commonly related to their financial performance.<sup>21</sup> Specifically, the prior literature on P/C and life insurer performance may offer important insight into insurer-specific factors that are likely to be associated with health insurer performance, as well. For example, among P/C and life insurers, stock and mutual companies are often found to differ in many ways, including their operating efficiency and performance.<sup>22</sup> Roughly 25% of health insurers are classified as “nonprofit” or “mutual.” The prior literature also suggests that capacity (e.g., the premium-to-surplus ratio), age and size are also significant determinants of performance.<sup>23</sup>

Health insurers’ operations extend beyond the traditional insurance functions of P/C and life insurers to the extent that they are also involved directly in the provision of health care services. Thus, additional insurer characteristics—i.e., those pertaining to the health care delivery aspect of the insurer—are included in our analysis as controls for performance. For example, while not synonymous with the design of distribution systems, we note several parallels between P/C insurers’ distribution systems and health insurers’ delivery systems.<sup>24</sup> First, both systems rely on negotiated financial arrangements; i.e., P/C insurers negotiate independent or exclusive arrangements with agents and brokers, while health insurers establish networks of providers. P/C insurance agents are given varying degrees of underwriting authority. Health insurance delivery systems vary in the types of mechanisms used to manage costs. For example, the HMO form is typically characterized by the use of gatekeepers, primary care physicians who control insureds’ access to more specialized providers. A majority of coverage is now written through PPOs.

P/C insurers can operate in a wide variety of lines. This feature has motivated several studies of the benefits of diversification, with somewhat different findings. For example, Liebenberg and Sommer (2008), and Berger, Cummins, Weiss and Zi (2000) examine the *strategic focus hypothesis* and the *conglomeration*

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21. See Browne and Hoyt (1995); Grace and Hotchkiss (1995).

22. There is a vast literature documenting the relationship between insurer ownership structure and performance. For example, Mayers and Smith (1988) examine the impact of ownership structure on differences across the insurance industry in lines of business finding differences in ownerships structure and line of business concentration. Lamn-Tennant and Starks (1993) document the relationship between ownership structure and the risk of an insurer’s activities. In general, the persistence of competing organizational forms in the P/C insurance market is attributed to particularities in the lines of business in which the insurer operates. See also McNamara (1991) and Ho et al. (2012).

23. See, for example, Born (2001), Shim (2010), Kraus and Ross (2012), and Doumpou et al. (2012). Many studies of the determinants of insurer financial performance also include consideration of the insurance cycle (e.g., Grace and Hotchkiss (1995)) or predicting insolvency (e.g., Cheng and Weiss (2012)). Size and age are also significant determinants of insurer growth (Choi (2010)).

24. Here, “delivery system” is used to identify the specific managed care mechanism by which a health insurer provides health care services to enrollees; e.g., through a health maintenance organization (HMO).

*hypothesis*. The *strategic focus hypothesis* states that diversification may be detrimental to insurer performance due to exacerbated agency costs and inefficient cross-subsidization of other internal projects, while the *conglomeration hypothesis* asserts that diversification may enhance insurer performance via scope economies, larger internal capital markets and risk reduction. Liebenberg and Sommer (2008) find support for the *strategic focus hypothesis*, which asserts that the market penalizes diversified P/C insurers due to the fact that the costs of line of business diversification are greater than the benefits of line of business diversification. Berger et al. (2000) note that many insurers offer P/C insurance products only, others offer life insurance/health insurance products only, and still other insurers offer both P/C and life/health products. The results of Berger et al. (2000) indicate that *strategic focus* dominates in some circumstances, while *conglomeration* dominates in other circumstances. To the extent that the participation in both public and private lines of health insurance business is indicative of diversification, we rely on these works to better understand the potential relationship between participation in public and private health insurance programs and health insurer performance.

### 3. Development of Hypotheses

Participation in government programs is voluntary and commercial health insurers are also free to determine their level of participation in a given program. As noted in many studies (e.g., Coughlin et al. (2001); Long and Yemane (2005)) participation in these, and similar government-related programs, has real economic implications. Assuming that commercial health insurers are profit-maximizing entities, we expect that participation does not result in a decrease in profitability and may, in fact, improve the overall profitability of the insurer. On a case-by-case basis, a non-zero number of commercial insurers will not experience positive operating performance due to idiosyncratic company and market factors<sup>25</sup> (e.g., incorrect revenue projections, inadequate administrative infrastructure, unexpected changes in reimbursement schedules, etc.). However, due to the fact that a large number of commercial insurers elect to participate in government insuring programs for extended periods of time, we suspect that, in the aggregate, operating performance is not adversely affected by the level of commercial insurers' participation in government health insurance programs.

The first measure of operating performance that we consider, the MLR, has been considered by other studies of health insurance markets (e.g., Karaca-Mandic et al. (2015)). In our analysis, the variable is defined as the dollar amount of health insurance losses incurred by the commercial insurer scaled by the dollar amount of premiums earned. All else equal, a lower MLR indicates superior operating

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25. For example, some studies (e.g., Ellis and Gurol (2004)) suggest that non-price factors may be a relevant factor in explaining trends in government program participation.

performance in terms of the risk-selection process (i.e., underwriting performance). We acknowledge that, for example, certain companies may err in the underwriting process, and premiums are not very flexible in government insuring programs, so we would therefore not expect that every commercial insurer participating in government insuring programs would have lower MLRs. However, to the extent there are certain features of government insuring programs that provide commercial health insurers the opportunity to improve underwriting performance, we expect to observe, in the aggregate, a negative relation between level of involvement in government insuring programs and MLRs.<sup>26</sup> Formally, we hypothesize that:

*H1: Participation in government health insurance programs is associated with a lower overall medical loss ratio.*

Next, we consider the relationship between participation in government insuring programs and the expense ratio (ER) of commercial insurers. The expense ratio—calculated as the ratio of dollar expenditures on administrative expense scaled by the dollar amount of net premiums written—quantifies an insurer’s cost of acquiring and administering business. The nature of government insuring programs may provide health insurers participating in government programs the opportunity to improve performance via reduced expenses. Compared to government insuring programs, private insuring programs may have higher administrative expenses due to such factors as interacting with a wider range of providers, non-standard policy coverages or agent/broker fees. The relatively standardized nature of government insuring programs, in terms of policy forms and reimbursement schedules, might further reduce the relative amount of administrative expenditures of commercial insurers participating in government insuring programs, but bureaucratic issues, such as determining eligibility for the public program, may increase these expenses.<sup>27</sup> Also, some commercial insurers may not have the administrative infrastructure and expertise to be successful in a

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26. We acknowledge that program-specific factors, such as rate regulations or reimbursement rates, differ across insuring programs. However we believe that operating within the confines of program-specific factors does not preclude the potential for different underwriting advantages among participation in the various insuring programs. Further, since the government insuring programs examined in our analysis insure specific subsets of the population, there may be more certainty in underwriting a government program than in underwriting a random population. For example, all else equal, the error in estimating the medical losses of a group of persons 65 years and older in a Medicare program is likely to be smaller than the error in estimating medical losses of a group of persons of any age range in a group comprehensive health insurance setting. As such, commercial insurers participating in government insurance programs may exhibit a lower variation in losses relative to premiums, than those commercial insurers not participating in public programs.

27. Other studies (e.g., McCue and Bailit (2011)) have noted that multiproduct plans are potentially associated with higher administrative costs.

government insuring programs, which could result in higher expenses. The effect of participation in government programs on the insurer's overall expenses is an empirical question, but we presume that insurers would be unlikely to participate in public programs if such participation represented a significant increase in administrative costs. Therefore, we posit:

*H2: Participation in government health insurance programs is associated with a lower expense ratio.*

We also consider the overall effect of participation in government programs on operating performance by examining the combined ratio (CR), which is an important financial ratio considered in the insurance literature (e.g., Browne and Hoyt (1995)). The CR is the sum of the MLR and the ER and provides an aggregate indication of an insurer's operating performance. It is possible that participation in government programs has a differential influence on one subcomponent of performance than it has on another subcomponent (i.e., MLR or ER). For example, if participation in Medicaid is associated with a slight improvement in the MLR and a corresponding increase in the ER, then evaluating the CR provides insight into the net effect that participation in Medicaid has on operational performance. Given our expectations for H1 and H2, we anticipate a negative relation between the level of involvement in government insuring programs and an insurer's overall CR. Formally, we hypothesize that:

*H3: Participation in government health insurance programs is associated with a lower overall combined ratio.*

Finally, we evaluate insurers' return on assets (ROA)—defined as net income scaled by total admitted assets—to quantify the relation between participation in government health insurance programs and a broad measure of health insurer financial performance. While the aggregated nature of ROA may distort certain dynamics of the direct relation between operational performance and participation in government insuring programs (e.g., by including investment income in net income), it provides important and robust perspective when considered with the other three measures of operational performance in our analysis. In addition, ROA is frequently examined by many studies (e.g., Liebenberg and Sommer (2008)) pertaining to the financial performance of insurance firms. For example, participation in a given government program may be associated with higher administrative expenses but also simultaneously create opportunities that lead to higher revenues (e.g., increased market power is

associated with more favorable provider contracting schemes for the health insurer). We therefore hypothesize that:

*H4: Participation in government health insurance programs is associated with a higher return on assets.*

## 4. Data and Methodology

We examine data from the NAIC annual financial statements of all insurers engaged in providing health insurance coverage for the years 2002 through 2009 in all 50 states and the District of Columbia.<sup>28,29</sup> All commercial insurers required to file a health annual financial statement are included in the NAIC health insurance database, and the data contain detailed information about health insurer operations and data include information regarding premiums, losses, enrollment, managed care arrangements, expenses, etc. The subset of NAIC data we analyze are at the insurer level (i.e., not aggregated to the group level) and pertain to overall insurer performance, line of business operations and insurer operating characteristics. After the application of appropriate filters, our final panel data set contains 4,829 insurer-year observations; summary statistics are found in Table 2.<sup>30</sup>

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28. Our sample is the most recent possible for this analysis; our demographic and health care variables are not available past 2009.

29. The NAIC database provides the most comprehensive source of commercial insurer financial information available. However, the data available is somewhat limited in a few respects. First, until recently California required managed care organizations to file operating and financial data with the Department of Health and not necessarily with the NAIC and California is, therefore, excluded from our sample. This is consistent with other health insurance research (see, for example, Cole, He and Karl (2015)). Further, a number of persons receive health insurance through self-insured employees. Since we do not have financial data regarding self-insured plans, and our sample does not include all persons with health insurance. We checked the total enrollment counts for insurers in our sample versus the U.S. Census Bureau, Current Population Survey and we checked the total enrollees in Medicaid against data from the federal Centers for Medicare & Medicaid Services (CMS). We find that the NAIC data contain roughly 70% of privately insured persons in the U.S. We therefore believe that, despite a few limitations, our sample is representative of the population of commercial insurers operating in the U.S.

30. Consistent with prior insurance studies, we institute several filters to ensure that our sample contains viable firms actively operating as commercial insurers. In particular, we restrict our sample to include only firms with at least \$1,000 in total premiums, losses, surplus and assets.

**Table 2:  
Summary Statistics (N = 4,829)**

Variable	Mean	Std. Dev.	Min.	Max.
MLR	0.83	0.10	0.460	1.606
ER	0.12	0.08	0.005	0.602
CR	0.95	0.09	0.659	2.065
ROA	0.07	0.14	-0.446	0.689
Medicare Share	0.12	0.26	0	1
Medicaid Share	0.14	0.31	0	1
FEHBP Share	0.03	0.09	0	1
Medicare Supplement Share	0.01	0.06	0	1
Individual Comprehensive Share	0.03	0.11	0	1
Dental and Vision Share	0.21	0.40	0	1
Other Business Share	0.03	0.14	0	1
Line of Business HHI	0.81	0.23	0.208	1
Share of Business in States that Run Medicaid Programs	0.13	0.33	0	1
Size	17.50	1.97	10.980	23.155
Premium to Surplus Ratio	7.94	29.32	0.036	1835.044
HMO Enrollment Share	0.57	0.46	0	1
PPO Enrollment Share	0.14	0.30	0	1
POS Enrollment Share	0.08	0.20	0	1
Age	23.04	16.09	1	102
Mutual Indicator	0.03	0.16	0	1
Nonprofit Indicator	0.27	0.44	0	1
Group Indicator	0.74	0.44	0	1
Females Per Capita Weighted by DPW Share	0.51	0.01	0.476	0.522
Persons Over 65 Per Capita Weighted by DPW Share	0.12	0.02	0.056	0.172
Median Income Per Capita Weighted by DPW Share	47613.70	6853.78	29359.000	68059.000
Uninsured Persons Per Capita Weighted by DPW Share	0.14	0.04	0.043	0.254
Hospital Admissions Per Capita Weighted by DPW Share	0.03	0.03	0.004	0.235
Total Hospital Spending Per Capita Weighted by DPW Share	0.01	0.00	0.004	0.009

In Table 3, we report more detailed summary statistics for firms operating in Medicare, Medicaid and FEHBP business.<sup>31</sup> More specifically, we compute the proportion of a firm's total business that is derived from each of these three lines of business, and, for firms with a non-zero share of participation in these lines, we display several operating performance measures by quartile. As shown in the table, many firms do not elect to participate in a given line but, for those that do, we find summary evidence of differences in performance among participation quartile. For example, firms at the highest quartile of Medicare share have, on average, lower

31. Note that, in the columns of the table, Qne denotes the quantile based on the share of business in a given line of business (e.g., Q1 is the first quantile, Q2 is the second quantile, etc.). The number of observations for a given quantile in each line of business is given in parentheses in each column. Note also that the summary information pertains only to firms in our sample with positive premiums in a given line of business.

MLRs and average ROA declines among each Medicaid share quartile. The econometric analysis below will help to explore the summary information present in Table 3 in more detail.

**Table 3:**  
**Performance Measures by Quartile of Business Share**

Panel A: Firms With Medicare Business				
	Q1 (N = 423)	Q2 (N = 422)	Q3 (N = 422)	Q4 (N = 422)
MLR	0.8458	0.8619	0.8609	0.8362
ER	0.0975	0.0907	0.0926	0.1165
CR	0.9433	0.9526	0.9536	0.9527
ROA	0.0806	0.0841	0.0889	0.0762

Panel B: Firms With Medicaid Business				
	Q1 (N = 313)	Q2 (N = 312)	Q3 (N = 312)	Q4 (N = 312)
MLR	0.8712	0.8613	0.8483	0.8689
ER	0.0875	0.0955	0.1019	0.1044
CR	0.9587	0.9569	0.9502	0.9733
ROA	0.0831	0.0828	0.0678	0.0517

Panel C: Firms With FEHBP Business				
	Q1 (N = 303)	Q2 (N = 303)	Q3 (N = 303)	Q4 (N = 302)
MLR	0.8558	0.8668	0.8637	0.8488
ER	0.0992	0.0903	0.0911	0.08847
CR	0.9551	0.9571	0.9548	0.9335
ROA	0.0826	0.0891	0.0855	0.0852

Our data set also contains state-level demographic information from various sources, such as the U.S. Census Bureau and the Kaiser Family Foundation.<sup>32</sup> While many commercial insurers in our sample restrict operations to a single state, some commercial health insurers report operations for multiple states. When insurers operate in multiple states, we assign these companies a weighted value of

32. State per capita measures of females, persons over 65 per capita, median income and uninsured were obtained from the U.S. Census Bureau. Total health care expenditures per capita, and the variable to indicate state-run Medicaid programs were obtained from CMS. Hospital admissions per capita was obtained from the American Hospital Association.

the state-level demographic variables, where the weights are based on the proportion of the insurers' total premiums in each state.<sup>33</sup>

We then use these data to test our hypotheses relating to the commercial insurer's operating performance and their participation into government health insurance programs. Our strategy is to develop an empirical model that allows us to examine the cross-sectional relationship between a given level of involvement in a government insuring program and operational performance while simultaneously considering the effects of insurer-level and state-level factors that could influence operational performance.<sup>34</sup> As such, we estimate the following OLS model:

$  \begin{aligned}  Performance_{it} = & \alpha + \beta_1 MedicareShare_{it} + \beta_2 MedicaidShare_{it} \\  & + \beta_3 FEHBPSHare_{it} + \beta_4 MedicareSuppShare_{it} \\  & + \beta_5 IndivCompShare_{it} + \beta_6 Dental\&VisionShare_{it} \\  & + \beta_7 OtherBusShare_{it} + \beta_8 LOBHHI_{it} \\  & + \beta_9 SRMedicare_{it} + \beta_{10} Size_{it} + \beta_{11} PremSurp_{it} \\  & + \beta_{12} HMOShare_{it} + \beta_{13} PPOShare_{it} + \beta_{14} POSShare_{it} \\  & + \beta_{15} Age_{it} + \beta_{16} Mutual_{it} + \beta_{17} NonProfit_{it} \\  & + \beta_{18} Group_{it} + \beta_{19} Females_{it} + \beta_{20} Over65_{it} \\  & + \beta_{21} PerCapInc_{it} + \beta_{22} Uninsured_{it} \\  & + \beta_{23} HospAdmits_{it} + \beta_{24} HospSpend_{it} \\  & + \sum_{j=1}^{49} StateShare_{ijt} + \sum_{k=1}^8 \gamma_k Year_k + \varepsilon_{it}  \end{aligned}  $	(1)
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33. To elaborate on the state-level demographics weighting method, consider the following example: In 2009, a given insurer has \$1 million in total premiums; \$.75 million from State A and \$.25 million from State B. Median income in State A is \$50,000 and Median Income in State B is \$30,000. In our sample, this insurer would be assigned a median income value of \$45,000 for the year 2009.

34. To the extent that operational performance measures and the level of participation in government insuring programs are determined in equilibrium, we acknowledge the potential for endogeneity. However, our analysis seeks only to observe and document the cross-sectional relationship between the level of commercial insurers' participation in government insuring programs and commercial insurers' operational performance. We leave the analysis of the factors surrounding the decision to enter government programs and its effects on operational performance as an area of future research.

Where:

$MedicareShare_{it}$  = the share of business insurer  $i$  has in Medicare during year  $t$ .

$MedicaidShare_{it}$  = the share of business insurer  $i$  has in Medicaid during year  $t$ .

$FEHBPSHare_{it}$  = the share of business insurer  $i$  has in the FEHB during year  $t$ .

$MedicareSuppShare_{it}$  = the share of business insurer  $i$  has in Medicare Supplement Plans during year  $t$ .

$IndivCompShare_{it}$  = the share of business insurer  $i$  has in individual comprehensive health insurance during year  $t$ .

$Dental&VisionShare_{it}$  = the share of business insurer  $i$  has in Dental and Vision Insurance during year  $t$ .

$OtherBusShare_{it}$  = the share of business insurer  $i$  has in Other Business Lines during year  $t$ .

$LOBHHI_{it}$  = the share of business insurer  $i$  has in Medicare during year  $t$ .

$SRMedicare_{it}$  = the share of business insurer  $i$  has in states with state-run Medicaid programs in year  $t$ .

$Size_{it}$  = is Total Assets for insurer  $i$  in year  $t$ .

$PremSurp_{it}$  = the ratio of premiums written to policyholder surplus for insurer  $i$  in year  $t$ .

$HMOShare_{it}$  = the share of business insurer  $i$  has in HMO plans during year  $t$ .

$PPOShare_{it}$  = the share of business insurer  $i$  has in PPO plans during year  $t$ .

$POSShare_{it}$  = the share of business insurer  $i$  has in POS plans during year  $t$ .

$Age_{it}$  = the number of years that insurer  $i$  has been in operation as of year  $t$ .

$Mutual_{it}$  = one if insurer  $i$  is a mutual company in year  $t$ , 0 otherwise.

$NonProfit_{it}$  = one if insurer  $i$  is a nonprofit company in year  $t$ , 0 otherwise.

$Group_{it}$  = one if insurer  $i$  is a member of a group in year  $t$ , 0 otherwise.

$Females_{it}$  = the weighted state-level proportion of females for insurer  $i$  in year  $t$ .

$Over65_{it}$  = the weighted state-level proportion of citizens over 65 for insurer  $i$  in year  $t$ .

$PerCapInc_{it}$  = the weighted state-level per capita income for insurer  $i$  in year  $t$ .

$Uninsured_{it}$  = the weighted state-level proportion of uninsured for insurer  $i$  in year  $t$ .

$HospAdmits_{it}$  = the weighted state-level per capita hospital admissions for insurer  $i$  in year  $t$ .

$StateShare_{ijt}$  = the share of business written in state  $j$  by insurer  $i$  during year  $t$ .

$Year_{it}$  = year dummy variables

As noted previously, we use four measures of *Performance* in our analysis: 1) the MLR, defined as medical losses incurred divided by net premiums earned for insurer  $i$  in year  $t$ ; 2) the ER, defined as administrative expenses scaled by net premiums written for insurer  $i$  during year  $t$ ; 3) the CR, which is the sum of the MLR and the ER; and 4) ROA. We estimate four separate regression models, each with the same set of regressors, but with a different measure of *Performance* as the dependent variable.

During the entirety of our sample period, health insurers report operations to the NAIC in nine lines of business: 1) group comprehensive; 2) individual comprehensive; 3) dental; 4) vision; 5) Medicare; 6) Medicaid; 7) FEHBP; 8) Medicare supplement; and 9) other. We compute the ratio of premiums written in each line of business to total premiums written for insurer  $i$  in year  $t$  and include all but one of these shares in our regression.<sup>35</sup> The share of business in group comprehensive is our omitted, comparison group. We combine shares in dental and vision business to form a single variable due to the operational similarities between dental and vision insuring arrangements, but we do not aggregate the remaining lines, because they represent exposure to different populations and there may be operational differences.<sup>36</sup>

The coefficients on the line of business share variables serve to test our four hypotheses. In particular, as discussed in Section 2, commercial insurers can elect to participate in the government health insurance programs of Medicare, Medicaid, FEHBP and Medicare supplement. A statistically significant coefficient on these variables would provide evidence on  $H1$ ,  $H2$ ,  $H3$  or  $H4$ , depending on the equation.

Next, we include insurer characteristics to control for insurer-specific factors that may influence a given measure of operating performance.<sup>37</sup> First, we include several measures that capture the insurer's focus and financial capacity. These include a line of business Herfindahl-Hirschman Index; the share of business in the states that operate a state-run Medicaid program; overall size, measured by total assets; and the premium-to-surplus ratio. Next, we characterize insurers further by the degree of control over utilization by including measures of the share of enrollment in HMOs, PPOs and point-of-service (POS) plans, respectively. Finally, we include the age of the insurer to control for experience, and three indicator measures to capture differences in organizational structure: 1) whether the insurer is incorporated as a mutual organization; 2) whether the insurer is incorporated as a nonprofit organization; and 3) whether an insurer is a member of an insurer group.

We include in our analysis other insurer-specific measures that are derived from state population demographic variables to control for the influence of population demographic factors for insurer  $i$  with a given level of business in state  $j$  during year  $t$ . As described previously, these state-level demographic factors are weighted by the proportion of total premiums a given insurer receives as a result of operating in a given state during a given year. The specific demographic variables included in our analysis are as follows: 1) females per capita; 2) persons

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35. We omit from this vector the share of group comprehensive benefits for a given firm in a given year in order to avoid econometric problems arising from singularity.

36. The number of insurers with positive premiums in each line is as follows: Medicare (361); Medicaid (252); FEHBP (221); Medicare Supplement (128); Individual Comprehensive (334); Dental and Vision (287); and Other (196).

37. Note that several firm-specific controls are time invariant indicator variables, which therefore preclude the inclusion of firm fixed effects in our model. However, we do cluster standard errors by firm.

age 65 and older per capita; 3) median income per capita; 4) uninsured persons per capita; 5) hospital admissions per capita; and 6) total hospital spending per capita.

Also included are state-specific shares of overall business, and indicator variables for each year. The state-specific share of business is defined as direct premiums written in state  $j$  scaled by total direct premiums written for insurer  $i$  in year  $t$ . These variables control for omitted regulatory, economic, demographic and similar state-specific factors that may influence the performance of commercial insurers operating in a given state.<sup>38</sup> Dummy variables for each year are included to control for year-specific effects, such as variations in claims levels, market factors and similar macroeconomic conditions that could influence commercial insurers' operating performance. Our equations are estimated with Huber-White estimators of variance to control for heteroskedasticity.

## 5. Results

Table 4 presents the results of estimating equation 1. From a broad context, the results provide varying evidence related to  $H1$ ,  $H2$ ,  $H3$  and  $H4$ , depending on the operational performance measure employed in the model. Our overall results suggest a weak relationship between the level of participation in public health insurance programs and the operational performance of health insurers. Joint F-tests indicate that, for the MLR and ER model specifications, the coefficients of the Medicare, Medicaid and FEHBP Share variables are not equal to zero and are not equal to the other line of business share variables in all but two instances. Examining the coefficients of the Medicare, Medicaid and FEHBP Share variables among all four model specifications indicates three statistically significant coefficients that support our hypotheses, one statistically significant coefficient that refutes our hypotheses and eight statistically insignificant coefficients.

Examining the results in more detail, we first note that the estimated coefficient on the Medicare Share variable is negative and statistically significant at the 10% level when MLR is the dependent variable. In support of  $H1$ , this result suggests that, relative to the omitted category of group comprehensive health benefits, commercial health insurers with higher levels of participation in Medicare programs experience superior underwriting performance. However, we find no evidence which supports  $H2$ ,  $H3$ , or  $H4$  when evaluating the Medicare Share variable. We note that, while the lack of a statistically significant coefficient on the Medicare Share variable in the ER, CR, or ROA regressions does not suggest many operational benefits to participation in Medicare business, it also does not suggest many operational costs associated with Medicare.

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38. Note that Iowa is the omitted category and we were forced to exclude California from our analysis due to data inconsistencies discussed in footnote 29.

**Table 4:**  
**Regression Results (N=4,829)**

Variable	MLR	ER	CR	ROA
Medicare Share	-0.016*** [0.006]	0.007 [0.004]	-0.010* [0.006]	0.013 [0.010]
Medicaid Share	-0.007 [0.005]	0.008*** [0.003]	0.001 [0.005]	-0.005 [0.007]
FEHBP Share	0.039*** [0.013]	-0.040*** [0.010]	-0.001 [0.015]	0.075*** [0.026]
Medicare Supplement Share	-0.102*** [0.032]	0.103*** [0.022]	0.001 [0.034]	-0.093** [0.040]
Individual Comprehensive Share	-0.068*** [0.013]	0.033*** [0.012]	-0.036*** [0.012]	0.031 [0.022]
Dental and Vision Share	-0.100*** [0.007]	0.043*** [0.005]	-0.058*** [0.006]	0.107*** [0.009]
Other Business Share	-0.030** [0.014]	0.019* [0.010]	-0.011 [0.013]	-0.001 [0.017]
Line of Business HHI	0.010 [0.007]	-0.022*** [0.006]	-0.012* [0.007]	-0.015 [0.011]
Share of Business in States that Run Medicaid Programs	0.011 [0.011]	0.013* [0.007]	0.023** [0.010]	0.011 [0.013]
Size	0.005*** [0.001]	-0.017*** [0.001]	-0.013*** [0.001]	0.017*** [0.002]
Premium to Surplus Ratio	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	-0.000** [0.000]
HMO Enrollment Share	0.002 [0.007]	0.002 [0.005]	0.005 [0.006]	0.031*** [0.008]
PPO Enrollment Share	0.002 [0.007]	0.016*** [0.005]	0.018*** [0.006]	-0.044*** [0.009]
POS Enrollment Share	-0.034*** [0.009]	0.018*** [0.007]	-0.016* [0.008]	0.032*** [0.012]
Age	-0.000 [0.000]	0.000*** [0.000]	0.000* [0.000]	-0.000 [0.000]
Mutual Indicator	-0.006 [0.007]	-0.003 [0.006]	-0.009 [0.006]	-0.019** [0.009]
Non-Profit Indicator	0.036*** [0.003]	-0.018*** [0.002]	0.018*** [0.003]	-0.033*** [0.005]
Group Indicator	-0.003 [0.004]	-0.001 [0.003]	-0.004 [0.003]	-0.008 [0.005]
Females Per Capita Weighted by DPW Share	-0.051 [0.648]	0.064 [0.391]	0.012 [0.599]	0.317 [0.819]
Persons Over 65 Per Capita Weighted by DPW Share	0.088 [1.083]	0.852 [0.668]	0.940 [1.024]	-2.408* [1.420]
Median Income Per Capita Weighted by DPW Share	-0.000 [0.000]	-0.000 [0.000]	-0.000** [0.000]	0.000** [0.000]
Uninsured Persons Per Capita Weighted by DPW Share	-0.045 [0.141]	0.012 [0.103]	-0.033 [0.147]	0.242 [0.189]
Hospital Admissions Per Capita Weighted by DPW Share	-0.262 [0.863]	0.484 [0.596]	0.223 [0.979]	1.357 [1.005]
Total Hospital Spending Per Capita Weighted by DPW Share	11.941 [12.166]	-4.058 [7.422]	7.883 [11.945]	-8.673 [16.560]
Constant	0.740** [0.313]	0.324 [0.201]	1.065*** [0.288]	-0.297 [0.417]
R-squared	0.265	0.368	0.112	0.135

Robust standard errors in brackets  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

When we examine the estimated coefficients on the Medicaid Share variable, we find that the variable is not significant in any of the four regression equations. This result does not support any of the four hypotheses with respect to Medicaid participation. While the combined ratio is positively related to the insurer's share of business in with a state-run Medicaid program, our results suggest that participation in Medicaid programs does little to help or hurt the operational performance of health insurers.

Evaluating the results of the FEHBP Share variable provides further insight into the relation between participation in public programs and health insurer operating performance. The estimated coefficient is positive and statistically significant at the 10% level in the MLR regression, which indicates that, relative to the level of participation in group comprehensive health insurance benefits, higher levels of participation in FEHBP is associated with inferior underwriting performance. This result refutes *H1*. However, the sign and statistical significance of the FEHBP variable in the ER and ROA regressions provide support for *H2* and *H4*, respectively. In particular, the negative and statistically significant coefficient when ER is the dependent variable indicates that, relative to the omitted category, higher levels of participation in FEHBP are associated with higher levels of operating performance, in terms of ER. Also, the positive and statistically significant coefficient on the ROA regression indicates that higher levels of participation in FEHBP are associated with higher levels of ROA. We find no evidence for or against *H3* when specifically considering FEHBP, suggesting any potential benefits in reducing expenses are likely washed out by higher loss ratios.

While not a specific focus of our analysis, we find several significant relationships between performance and participation in other programs. For example, participation in the Medicare supplement program is associated with superior underwriting performance. However, we also find that participation in the Medicare supplement program is associated with higher ERs and lower ROAs. Overall, these results suggest that there may be operational benefits and drawbacks for insurers that provide Medicare supplement policies. Participation in the remaining non-public health insurance programs is also related to health insurer operational performance. In particular, we find that, relative to the share of group comprehensive health benefits, higher levels of involvement in individual comprehensive health benefits are associated with lower MLRs and CRs, but higher ERs. We find similar results regarding participation in dental and vision private insuring programs except that insurers participating in dental and vision programs also have higher ROAs.

Our results also indicate that a variety of additional insurer-specific and state-market factors are related to health insurer operational performance. Line of business diversification, operating in states with state-run Medicaid programs, size, premium-to-surplus ratio, managed care type and ownership structure are all associated with different measures of operational performance in varying manners. We further find that the relationship between state-market characteristics and health insurer operational performance is relatively weaker than that of the other variable categories included in our analysis. In particular, we find statistically

significant coefficients only on median income per capita. However, we note that the inclusion of the state share variables in our regression (given as  $Z_{i,t}$  in equation 1) likely accounts for the majority of state-level variation in our model and may dampen the explanatory power of the state-specific variables.

When considered in their entirety, our results suggest that, in many instances, a positive relationship exists between health insurer operating performance and participation in government health insurance programs. While we do not attempt to capture the self-selection that occurs when insurers either opt in or out, our evidence shows that commercial insurers can participate in public programs and maintain overall profitability. Further, the fact that several of our measures of participation in public programs are not statistically related to operating performance suggests that participation in government insuring programs may not be detrimental to the performance of health insurers.

While we cannot directly estimate if these insurers maintain profitability through strategic subsidization across public and private programs, we suspect the opportunities for such subsidization are limited due to the design of public programs and the competitive environment in which these insurers operate to provide private coverage. To the extent that similarities exist between participation in the ACA's health insurance exchanges and participation in current government health insurance, our results indicate that participation in health insurance exchanges may be associated with superior operating performance. However, we acknowledge that our analysis provides weak support for the supposition that participation in government programs is negatively related to health insurer performance, suggesting that there remains the potential for participation in health insurance exchanges to be associated with inferior operational performance.

## 6. Conclusion

The ACA has brought about unprecedented changes in the U.S. health insurance market and may fundamentally change the degree to which commercial health insurance companies interact with government health insurance programs. As such, it is important to understand and document the relationship between participation in government health insurance programs and the operating performance of health insurers. Interestingly, many commercial health insurers today choose to participate in public health insurance programs, which suggests that participation is associated with some operational benefit. Our results generally support this assumption. Using data from the NAIC health insurance database, we examine the extent to which private health insurers' participation in the government insuring programs of Medicare, Medicaid and the FEHBP is associated with operational performance. We note that the goal of our analysis is not to determine causality, but rather to examine the cross-sectional relationship that exists between health insurer performance and participation in government health insurance programs in the years prior to enactment of the ACA.

Participation by private insurers in the health insurance exchanges varies across the states and has been volatile in the first three years of operation. While the specific requirements for participation (e.g., the types of plans they are allowed to offer) are beyond the scope of this study, we note that these requirements are likely to cause some growing pains for private insurers as they consider the adequacy of their prices, the requisite size of their provider networks and other strategies in the ACA regime. Our results here suggest that private insurers have developed the necessary expertise for participating in public health insurance programs and they will similarly prosper in the health insurance exchange arena.

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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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