# Organizational Form and Regulatory Compliance: Evidence from Medical Loss Ratio Regulation

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**Abstract**

I study how organizational form affects regulatory compliance using the Affordable Care Act's 80 percent medical loss ratio (MLR) requirement. Using a triple-differences design that exploits variation in insurers' pre-regulation compliance gaps, I show that traditional insurers exhibit a response proportional to the size of the compliance gap, while vertically integrated insurers display a response approximately 90 percent smaller and largely independent of their gap. The differential response is concentrated in reported claims rather than quality improvement or administrative expense channels and is consistent with the use of internal transfer pricing within integrated insurer-provider systems. The results suggest that organizational form shapes how firms comply with regulations and therefore the effectiveness of regulation itself.

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# 1 Introduction

Can firms comply with a binding regulation without actually doing what the regulation requires? This question is central to the welfare consequences of regulatory policy. Economic theories of regulation typically emphasize incentives, but firms facing identical incentives may respond differently if organizational structure alters the set of feasible compliance strategies. Firms often face the same regulation but operate under different organizational forms, giving them access to different technologies for achieving compliance. Regulatory effectiveness therefore depends not only on the incentives created by policy, but also on the organizational structures through which firms respond. This paper studies this idea using the Affordable Care Act's medical loss ratio (MLR) requirement, a central regulation in health insurance markets where firm behavior and competition have important welfare consequences (Gaynor and Starc, 2026). I show that organizational form can alter how regulated firms achieve compliance, and argue that vertical integration may create access to internal transfer pricing as a compliance strategy.

Regulations that condition profits or penalties on reported costs create incentives to alter the costs used to demonstrate compliance. Existing work has primarily focused on these incentive effects but pays less attention to how organizational structure shapes the set of feasible compliance strategies. Vertical integration is one such organizational feature because it replaces certain market transactions with internal transactions. The medical loss ratio (MLR) provision, effective in 2011, requires individual-market insurers to issue rebates when their ratio of medical claims to premiums falls below 80 percent. Cicala et al. (2019) show that the regulation produced large increases in medical spending: insurers below the threshold closed most of their compliance gaps in the years following implementation, consistent with genuine care expansion. Their analysis, however, cannot determine whether this response was uniform across regulated firms or whether some firms complied through a different mechanism.

If transfer pricing is an important compliance technology, it yields a clear empirical prediction. If vertically integrated insurers—those that own or are affiliated with the

providers to whom they pay medical claims—can adjust prices paid to affiliated providers, their compliance responses should be largely independent of the size of their pre-regulation compliance gaps. By contrast, if insurers comply by genuinely expanding care, responses should be proportional to regulatory pressure because larger compliance gaps require larger increases in medical spending. The empirical results support the former prediction: traditional insurers respond in proportion to the size of their pre-regulation compliance gaps, whereas vertically integrated insurers exhibit responses that are largely independent of gap size.

I test this prediction using NAIC regulatory filings for individual-market insurers from 2001 to 2024 and a triple-differences design that interacts each issuer's pre-regulation distance below the 80 percent threshold with post-ACA timing and vertical integration status. Consistent with the prediction, vertically integrated insurers exhibit almost no relationship between regulatory pressure and compliance: the estimated slope is 0.070, approximately 90 percent smaller than the corresponding estimate for traditional insurers, while the post-ACA intercept increases by roughly 8 percentage points. Regardless of their initial compliance gaps, vertically integrated insurers increased their MLRs by approximately the same amount. In contrast, and consistent with Cicala et al. (2019), traditional insurers closed approximately 71 percent of their pre-regulation compliance gaps. This difference in how insurers respond to regulatory pressure is statistically significant, robust across specifications, and persists through 2024.

Several findings provide evidence consistent with transfer pricing as an important mechanism and are difficult to reconcile with explanations based solely on efficiency gains or care coordination. First, vertically integrated insurers with larger future compliance gaps reported systematically lower claims before the ACA, when there was no regulatory incentive to maintain high MLRs. Second, decomposition of the MLR numerator shows that the differential response is concentrated in the claims channel rather than quality improvement or administrative expense categories. Third, event study estimates show that the gap between integrated and traditional insurers persists and widens over time rather than converging.

This paper makes three contributions. First, it shows that organizational form shapes

how regulated firms achieve compliance. Prior work documents behavioral responses to the 80 percent MLR threshold and identifies gaming channels available to traditional insurers (Abraham et al., 2014; Born et al., 2023; Callaghan et al., 2020; Cicala et al., 2019; Eastman et al., 2021; Karaca-Mandic et al., 2015), but does not address *how* organizational structure shapes the set of feasible compliance strategies available to firms.[1] More broadly, a growing economics literature studies how health care payment rules create incentives for strategic responses to health care payment rules, including fraud, overbilling, and other forms of strategic reporting (Dafny, 2005; Geruso and Layton, 2020; Eliason et al., 2025; Leder-Luis and Malani, 2025). Relatedly, Gupta et al. (2026) show that ownership type influences both the propensity to exploit payment rules and how resulting revenue is deployed. I contribute by showing that organizational form itself expands the set of feasible compliance strategies available to regulated firms. Vertical integration creates access to internal transfer pricing, a compliance technology unavailable to firms that transact at arm's length.

Second, the paper provides evidence on the mechanism underlying the differential response. Contemporaneous and independent work by Kakani et al. (2026) documents transfer pricing by vertically integrated insurers in Medicare Part D, while Gandhi and Olenski (2024) show that organizational integration facilitates profit shifting through affiliated-entity transactions in nursing homes. I provide evidence consistent with the same underlying mechanism in health insurance markets through a two-sided test unavailable in other studies: the same transfer-pricing lever appears to operate in opposite directions before and after the regulatory change. In addition, decomposing the MLR numerator shows that the differential response is concentrated in the claims channel rather than quality-improvement or administrative expense channels, a pattern most consistent with intra-organizational transfer pricing and less consistent with the accounting reclassification strategies emphasized in prior work (Born et al., 2023; Eastman et al., 2021).

Third, the results add a regulatory arbitrage dimension to the welfare calculus of market

[1] I use the term gaming as shorthand for exploiting regulatory flexibility, without implying that vertically integrated insurers act improperly. The MLR provision creates incentives that firms respond to.

structure and vertical integration in health care (Dafny et al., 2012; Baker et al., 2014; Ho and Lee, 2017; Dafny et al., 2019; Koch et al., 2021). Even where vertical integration generates genuine efficiency gains, it may also create additional compliance strategies unavailable to non-integrated firms. The findings therefore suggest that organizational form can affect not only market outcomes directly, but also the effectiveness of regulations intended to shape those outcomes.

The paper proceeds as follows. Section 2 describes the MLR provision and the role of vertical integration in health insurance markets. Sections 3 and 4 present the data, identification strategy, and main results. Sections 5 and 6 present mechanism evidence and the event study. Section 7 presents robustness checks. Section 8 discusses limitations and policy implications. The paper concludes with implications for regulatory design.

# 2 Institutional Background

## 2.1 The ACA's Medical Loss Ratio Provision

The individual market serves consumers who purchase health insurance directly rather than through an employer, including self-employed individuals, workers at firms that do not offer coverage, and those who obtain coverage through the ACA's health insurance exchanges.

Prior to the ACA, individual-market insurers faced limited federal constraints on the allocation of premium revenue between medical spending and administrative costs. Beginning in 2011, the ACA required insurers to maintain an 80 percent medical loss ratio (MLR) or rebate premiums to enrollees. The provision was binding for many issuers and produced substantial compliance convergence (Cicala et al., 2019).

The regulatory formula defines the medical loss ratio (MLR) as incurred claims plus quality improvement (QI) expenses divided by earned premiums net of taxes. Administrative expenses, including claims processing, marketing, and profit, do not count toward the numerator. This structure creates two gaming channels relevant to the analysis. First, an insurer can inflate

the claims component by recording higher prices paid to providers, even if care volume is unchanged; this is the channel studied. Second, an insurer can reclassify administrative expenses as QI activities; prior work documents evidence of this channel (Born et al., 2023; Eastman et al., 2021).[2]

Enforcement is administered through annual NAIC financial filings at the state-market segment level. The regulation applies to fully insured coverage; self-insured employer plans are excluded.

A structural feature of the compliance framework creates an asymmetry between vertically integrated and traditional insurers. The implementing regulation (45 CFR Part 158, 75 FR 74921) defines incurred claims as direct payments to providers for covered clinical services, but is silent on whether payments to affiliated provider entities must reflect arms-length market rates, leaving no regulatory mechanism to detect or challenge transfer price adjustments that satisfy the letter of the 80 percent requirement.

## 2.2 Vertical Integration in Health Insurance Markets

Vertical integration between health insurers and health care providers takes several organizational forms in the US market. Provider-sponsored health plans, the form studied here, are insurance entities whose parent organization is a health care delivery system. These include fully integrated delivery systems such as Kaiser Permanente, hospital-system-affiliated plans such as UPMC Health Plan and Geisinger Health Plan, and physician-group-affiliated plans that bundle primary care delivery with insurance coverage. Vertically integrated insurers represent a substantial share of individual market activity.[3]

The central economic feature of insurer-provider integration is the elimination of arms'-

[2]The large group market threshold is 85 percent.

[3]The provider arms of VI systems in the sample are predominantly nonprofit hospital systems required to file Form 990 Schedule H with the IRS reporting community benefit expenditures. Although this creates an additional layer of financial reporting scrutiny, the IRS community benefit standard evaluates whether the hospital provides sufficient charitable activities to justify tax-exempt status, not whether intercompany payments between the insurance and provider arms reflect arms-length market rates. The MLR compliance gap therefore persists across all regulatory frameworks applicable to these entities.

length bargaining over provider payment rates. A traditional (non-integrated) insurer must negotiate prices with independent hospitals and physician groups in an external market, resulting in rates that reflect provider market power, network design, and utilization management (Ho and Lee, 2017). A vertically integrated insurer transacts with an affiliated provider rather than an independent one, so the price at which the insurer arm compensates the provider arm is an internal transfer price determined within the integrated organization rather than through market negotiation.[4]

The distinction matters because compliance under the MLR rule depends on reported claims spending. A traditional insurer seeking to increase its MLR must negotiate higher payment rates with independent providers, expand utilization, or both. These responses generally impose real economic costs and should scale with the size of the compliance gap. A vertically integrated insurer, by contrast, can adjust the transfer price paid to owned providers. [5] Because payments to affiliated providers count as medical claims under the MLR formula, higher transfer prices increase reported claims spending even when the volume and quality of care remain unchanged.

This organizational difference generates two empirical predictions. First, if transfer pricing is an important compliance technology, vertically integrated insurers' responses should be largely independent of the size of their compliance gaps. Second, prior to the ACA, when there was no regulatory incentive to maintain high reported claims, insurers with larger future compliance gaps should report systematically lower claims if the same transfer-pricing mechanism operated in reverse. Both predictions differ from explanations based solely on efficiency gains or care coordination.

[4]The use of internal transfer prices to shift reported income across regulatory or tax boundaries is well documented in the corporate taxation literature. Recent evidence suggests similar mechanisms may operate in health care markets (Kakani et al., 2026).

[5]Recent policy commentary has raised concerns about intercompany transactions between insurers and affiliated providers (Angeles and Bailit, 2025; Argüello and Murphy, 2025).

# 3 Data and Identification Strategy

## 3.1 Data

The primary data source is the NAIC Exhibit of Premiums, Enrollment and Utilization, which covers all individual comprehensive health insurance issuers from 2001 through 2024. The exhibit reports premium revenue, medical claims, enrollment, ambulatory encounter rates, and inpatient admission rates at the issuer-state-year level. I restrict to the individual comprehensive market throughout, excluding Medicare supplement, dental, vision, and short-term limited duration policies.

I classify issuers as vertically integrated if their organizational parent is a health care delivery system rather than a standalone insurance company. Classification uses a combination of string matching on NAIC company names and a manually verified issuer crosswalk, with ambiguous cases resolved by hand. I verify the final classification against NAIC Schedule Y holding-company filings, which report legally filed ownership structures. The final sample includes 24 vertically integrated issuer cocodes, all confirmed using Schedule Y ownership records.[6] The key outcome is the medical loss ratio.[7] I also construct claims and premiums per member month, claims per utilization unit (a proxy for the internal transfer price), and log enrollment as a size control. Additional controls include indicators for nonprofit status, HMO organizational form, and Blue Cross Blue Shield affiliation, and a state-level Herfindahl-Hirschman Index.

The VI sample consists primarily of long-standing provider-sponsored health plans whose organizational structure predates the ACA. Because vertical integration status is measured before implementation of the MLR rule, the estimates primarily reflect integrated delivery

[6] I describe the process of identifying vertical integration status in Appendix A. Schedule Y verification supports the classification of VI cocodes.

[7] The ACA calculates MLR rebate obligations using a three-year rolling average. The analysis uses annual issuer-level MLR to capture year-to-year behavioral responses to regulatory pressure. The rolling average is a compliance mechanism rather than a measure of annual insurer behavior. Using the rolling average would therefore bias against finding the results documented, making the annual MLR approach the more conservative choice.

systems rather than the more recent acquisition-based integration of physician practices and pharmacy benefit managers.[8]

The analysis sample restricts to issuer-state panels observed in 2010, the year immediately before the MLR provision took effect and the year in which I measure each issuer's pre-regulation compliance gap.[9] The restriction excludes 2,370 issuer-state-years (41%), consisting primarily of post-ACA entrants and issuers without 2010 filings. Excluded issuers are less likely to be vertically integrated (9.4% versus 15.2%), are smaller (median enrollment 11,600 versus 20,500 life-years), and are predominantly post-2014 entrants, a composition consistent with new market entry following ACA implementation rather than selective attrition of established issuers. The final sample contains 3,380 issuer-state-year observations covering 204 unique issuer-state pairs across 24 years.

Summary statistics in Table 1 show that vertically integrated issuers report higher average MLRs than traditional issuers (0.939 versus 0.861) but lower ambulatory encounter rates (6.5 versus 8.6 per life-year).

## 3.2 Identification Strategy

The identification exploits cross-sectional variation in issuers' pre-regulation distance from the 80 percent threshold. Following Cicala et al. (2019), I define treatment intensity as:

$$dist_below80_i = \max\big(0,\ 0.80 - MLR_{i,2010}\big) \tag{1}$$

This variable equals zero for issuers already compliant in 2010 and increases with the size of the compliance gap. Because it is defined by 2010 MLR, it is time-invariant within issuer, and therefore enters the model only through interactions with post-ACA timing and VI status.

[8] Appendix Figure A1 presents annual premium volume by insurer group in 2019, with Kaiser Foundation ($2.2 billion) ranking fifth among all individual market participants.

[9] The NAIC introduced the Qualified Improvement Expense reporting category in 2011, creating a small measurement discontinuity at the 2010–2011 boundary; year fixed effects absorb this change and the identification does not rely on MLR levels across this boundary.

The estimating equation is:

$$MLR_{ist} = \beta_1(dist \times post)_{it} + \beta_2(dist \times post \times VI)_{it} + \beta_3(dist \times VI)_i + \beta_4(post \times VI)_{it} + \gamma_i + \lambda_t + \delta_i t + X'_{ist}\pi + \varepsilon_{ist} \quad (2)$$

where $\gamma_i$ are issuer-state fixed effects, $\lambda_t$ are year fixed effects, and $\delta_i t$ are issuer-specific linear time trends. Standard errors are clustered at the issuer level.

The coefficient $\beta_1$ captures how traditional insurers' MLR responses vary with regulatory pressure and replicates the findings of Cicala et al. (2019) in the extended panel. The triple-difference coefficient $\beta_2$ is the key parameter: a finding of $\beta_2 < 0$ means VI issuers' MLR increases less per unit of regulatory pressure than traditional issuers, consistent with a compliance mechanism that is largely independent of the size of the compliance gap. The coefficient $\beta_4$ captures the VI baseline post-ACA shift independent of distance, and $\beta_3$ captures differential pre-period MLR behavior among VI issuers with greater compliance exposure.

The preferred specification includes issuer-specific linear trends to account for differential pre-regulation MLR trajectories across issuers. Omitting issuer-specific trends therefore risks attributing pre-existing differences in trajectories to the regulatory response.

The identifying assumption is that, conditional on these controls, issuers with different pre-regulation compliance gaps would have experienced parallel changes in MLR absent the ACA. I assess this assumption using a pre-period placebo regression that tests whether $dist_below80$ predicts differential MLR trends by VI status before 2011 ($p = 0.158$). Section 6 further evaluates the assumption using an event study that reports year-by-year estimates separately for vertically integrated and traditional issuers, normalized to the 2006–2009 pre-period mean. Time-invariant differences in enrollee risk affect MLR levels but do not bias the estimated differential response to regulatory pressure.

# 4 Main Results

The results show that vertically integrated and traditional insurers responded differently to the same regulatory pressure. Figure 1 and Figure 2 provides descriptive evidence that the MLR distribution shifts rightward and bunches just above the 80 percent threshold after 2011 for both traditional and vertically integrated insurers, indicating that the regulation was binding for both groups. The regression results show that the relationship between regulatory pressure and compliance differs sharply across the two groups.

Table 2 presents the main results. Column 1 replicates Cicala et al. (2019) in the extended 2001–2024 panel: traditional issuers closed approximately 76 percent of their pre-regulation compliance gap, a response stable across all specifications.

Column 2 presents a simple difference-in-differences comparing VI and traditional insurers post-ACA, identified from all 24 VI clusters. VI issuers increased their MLR by 0.059 percentage points more than traditional issuers post-ACA ($p = 0.009$), and maintained anomalously low MLR before the ACA relative to their compliance gap ($-1.211$, $p<0.001$). This specification does not exploit variation in compliance-gap size; Columns 3 and 4 introduce the triple-difference design.

Column 3 adds the triple-difference terms under the baseline two-way fixed effects specification. The VI intercept is positive but only marginally significant (0.057, $p = 0.087$), while the triple-difference coefficient is positive and opposite in sign from the preferred specification ($+0.458$, $p = 0.088$).

Column 4, the preferred specification, adds issuer-specific linear trends. The triple-difference coefficient reverses sign and becomes highly significant: $-0.656$ ($p<0.001$). The implied VI response to regulatory pressure is is 0.070, roughly one-tenth the traditional insurer estimate. The VI intercept increases to 0.087 ($p<0.001$). The VI triple-difference is identified from 24 issuer clusters; the event study in Section 6 supports that no single issuer's trajectory drives the finding.

The two key coefficients from Column 4 imply distinct compliance strategies. Traditional

insurers increase MLR in proportion to the size of their compliance gaps, consistent with costly care expansion. Vertically integrated insurers increase MLR by roughly eight percentage points regardless of their initial gap, consistent with a compliance mechanism that is largely independent of regulatory pressure. Figure 3 illustrates this contrast.

A third finding reinforces the transfer pricing interpretation. The pre-period coefficient on $dist \times VI$ is large, negative, and highly significant ($-0.994$, $p<0.001$): VI issuers with larger pre-regulation compliance gaps maintained anomalously low MLR before the ACA, consistent with the use of lower internal transfer prices when there was no regulatory incentive to report high claims. One concern is that provider subsidiaries may resist below-market internal prices.[10] Figure 2 provides complementary descriptive evidence: VI issuers exhibit substantially greater mass below the 80 percent threshold before the ACA than afterward, consistent with the estimated pre-period suppression effect.

# 5 Mechanism Evidence

The main estimates show that vertically integrated insurers exhibit an attenuated MLR response relative to traditional insurers. Distinguishing among these possibilities requires examining the channels through which insurers can increase reported MLRs: higher incurred claims, higher quality-improvement spending, reclassification of administrative expenses, or expanded utilization. The transfer pricing interpretation generates a specific prediction: VI insurers should differ from traditional insurers on the claims channel but not on QI expenses or administrative costs. Because VI insurers can adjust internal prices paid to owned providers, they can increase reported claims without changing care delivery, without arms'-length contract renegotiation, and without accounting reclassification. This section tests that prediction in two steps, using utilization data from the main NAIC Exhibit (Table 3) and a full decomposition of the MLR numerator from the NAIC Supplemental Health Care

[10] Provider subsidiaries may resist below-market internal prices because they often serve multiple external payers and maintain independent financial objectives.

Exhibit (Table 4).

## A. Utilization Responses

The strongest evidence in Table 3 comes from pre-regulation behavior. Across all six outcomes—claims per member month, premiums per member month, ambulatory encounters, inpatient admissions, claims per utilization unit, and log enrollment—the pre-period coefficient on $dist \times VI$ is large, negative, and highly significant. VI issuers with larger pre-regulation compliance gaps maintained systematically lower claims, lower utilization, and lower premiums before the ACA, relative to their own issuer fixed effects. This pattern is consistent with the transfer-pricing mechanism operating in the opposite direction before the ACA: when there was no regulatory incentive to maintain high reported claims, vertically integrated insurers with larger future compliance gaps reported systematically lower claims, utilization, and premiums.

Post-regulation, neither VI nor traditional issuers show significant utilization responses under the preferred specification: ambulatory encounters and inpatient admissions do not increase commensurately with reported claims for either group. For traditional insurers, the absence of large utilization responses suggests that compliance occurred primarily through higher negotiated payment rates rather than greater service use, consistent with the positive claims-per-utilization estimate in Column 3 of Table 3. For VI issuers, the absence of a utilization response alongside a large MLR increase is consistent with a compliance mechanism that is largely independent of the size of the compliance gap.[11]

Taken together, these results suggest that the increase in reported MLR among vertically integrated insurers was not accompanied by commensurate changes in observable utilization or enrollment. This pattern is consistent with a compliance mechanism operating primarily

[11] Several post-regulation triple-difference coefficients attenuate under the preferred specification relative to the two-way fixed effects specification (Appendix Table A2), consistent with the differential pre-existing trends that motivate the issuer trends correction. The NAIC Exhibit does not separately identify quality improvement expenses, which prior work has documented as a distinct gaming channel (Born et al., 2023); this is addressed in the next subsection.

through reported claims rather than expanded care delivery.

## B. MLR Numerator Decomposition

Table 4 decomposes the MLR numerator into incurred claims, quality-improvement (QI) expenses, and administrative costs using the NAIC Supplemental Health Care Exhibit (SHCE), which reports these components separately beginning in 2010. I estimate equation (2) using each component's share of adjusted premiums as the outcome. This decomposition identifies whether the differential response between vertically integrated and traditional insurers is concentrated in claims, QI spending, or administrative expense reclassification.

The results indicate that the differential response is concentrated in the claims channel. The triple-difference coefficient on claims share ($-1.061$, SE 0.095, $p<0.01$, Column 2) is nearly identical in magnitude to the coefficient on overall MLR ($-1.052$, SE 0.091, $p<0.01$, Column 1), indicating that nearly all of the differential response is concentrated in the claims component. The triple-difference coefficients on QI share (0.008, SE 0.014, Column 3) and admin share ($-0.014$, SE 0.147, Column 4) are small in magnitude and close to zero, suggesting that QI expense inflation and administrative reclassification play a minor role.

These results are consistent with the transfer-pricing interpretation. Traditional insurers must increase reported claims through arms'-length contracting or other compliance strategies documented in the prior literature. Vertically integrated insurers, by contrast, can increase reported claims through internal transfer prices paid to affiliated providers. The absence of differential responses in QI spending and administrative expenses suggests that the divergence between integrated and traditional insurers is concentrated in the claims channel rather than alternative accounting mechanisms.

Because the SHCE begins in 2010, parallel pre-trends cannot be evaluated directly. The decomposition should therefore be interpreted as evidence on the channel underlying the main results rather than as an independent identification strategy. The SHCE estimate for overall MLR ($-1.052$) closely resembles the preferred estimate from the full panel ($-0.656$, Table 2,

Column 4), suggesting that the decomposition captures the same underlying phenomenon.[12]

# 6 Event Study

Figure 4 plots year-by-year coefficients separately for vertically integrated and traditional issuers, normalized to the 2006–2009 pre-period mean. The event study complements the regression results by providing a visual assessment of the identifying assumptions and illustrating how responses evolved after implementation of the MLR requirement.[13]

Traditional issuers show flat pre-period coefficients clustered around zero through 2009, supporting the parallel trends assumption visually. Post-2011, their response builds gradually to approximately 1.0 per unit of regulatory pressure by 2015–2016 and remains stable through 2024. The persistence of this response through 2024 extends the temporal scope of Cicala et al. (2019) and suggests that the effects of the regulation did not dissipate over time.

Vertically integrated insurers exhibit a different dynamic. Their estimated response to regulatory pressure exceeds that of traditional insurers soon after implementation and continues to diverge over time. Rather than converging, the gap between the two groups widens throughout the post-ACA period, consistent with persistent differences in how vertically integrated and traditional insurers responded to the regulation.

The upward pre-period trajectory among vertically integrated insurers motivates the inclusion of issuer-specific linear trends in the preferred specification. Including issuer-specific linear trends absorbs these pre-existing trajectories, so the estimated post-ACA effects are identified relative to each issuer's own trend rather than a common baseline.

[12] The larger SHCE estimate likely reflects the reporting sample, which consists of larger and more established issuers.

[13] 2009 is used as the omitted baseline year rather than 2010 to avoid Ashenfelter's dip: treatment intensity is defined by 2010 MLR, making 2010 a local trough for treated issuers driven by transitory claims variation rather than reflecting structural compliance levels. Normalizing to the 2006–2009 mean provides a more stable visual baseline.

# 7 Robustness

Tables 5 and 6 examine the robustness of the main results across twelve alternative specifications. Across all specifications, traditional insurers exhibit a strong positive relationship between regulatory pressure and MLR responses. Under the preferred specification with issuer-specific linear trends, the differential response among vertically integrated insurers remains stable in sign, magnitude, and statistical significance.

The preferred specification remains robust to the most demanding sample restrictions. Excluding the COVID period yields an estimate of $-0.617$ ($p = 0.001$), while restricting the sample to pre-2014 entrants reproduces the benchmark estimate exactly ($-0.656$, $p < 0.001$). The estimated post-ACA shift for vertically integrated insurers also remains positive and statistically significant across all specifications.

The balanced-panel, large-issuer, and extended pre-period specifications all produce the same qualitative conclusion. Relative to the baseline two-way fixed effects specification, estimates under the preferred specification attenuate toward zero rather than reversing sign, consistent with the importance of accounting for issuer-specific pre-existing trends.

A potential concern is that VI insurers are disproportionately organized as HMOs, which structurally have lower premiums and more restricted networks. Restricting the sample to HMO issuers yields qualitatively similar results, indicating that the findings are not driven by differences between HMO and non-HMO organizational forms.

Finally, I verify the vertical integration classification using NAIC Schedule Y holding-company filings for 2011–2025. All 24 issuers classified as vertically integrated are confirmed to be controlled by health care delivery systems rather than standalone insurance companies. Taken together, these checks indicate that the main findings are robust to alternative samples, specifications, and measures of vertical integration.

# 8 Discussion

## 8.1 Evidence on Transfer Pricing

The central limitation of the analysis is that internal transfer prices between vertically integrated insurers and affiliated providers are not directly observed. The NAIC filings record reported claims rather than the transfer prices that generate them. Consequently, I cannot rule out that part of the differential claims response reflects genuine increases in utilization at affiliated providers. However, the absence of corresponding utilization responses (Table 3) and the concentration of the effect in the claims component rather than QI or administrative expenses (Table 4) are more consistent with transfer pricing than with alternative explanations.

For the nonprofit integrated systems that constitute the VI sample, IRS Form 990 annual filings provide additional evidence on intercompany transaction flows. These filings require disclosure of affiliated-entity relationships, transaction types, and dollar volumes between related organizations. Appendix Table A2 reports intercompany financial flows for Geisinger Health Plan—the gap-positive VI issuer with the largest pre-regulation compliance gap in the sample—across five fiscal years spanning the pre-ACA baseline and post-ACA periods.

Illustrative evidence from Geisinger Health Plan's Form 990 filings is consistent with this proposed mechanism. Intercompany shared-services revenue increased by 80 percent between FY2009 and FY2011, compared with 12.7 percent growth in premiums over the same period (Appendix Table A2). Although not definitive evidence of transfer pricing, these filings illustrate that intercompany financial flows changed substantially around implementation of the MLR rule and are consistent with the proposed mechanism.

## 8.2 Generalizability

The estimates are identified from long-standing integrated delivery systems whose organizational relationships predate the ACA. As a result, they may not generalize directly to newer

forms of insurer-provider integration that emerged through the post-2015 wave of insurer acquisitions of physician practices, PBMs, and related entities. Understanding whether similar mechanisms operate in these settings remains an important area for future research. Although the empirical setting is the ACA's MLR regulation, the underlying issue extends more broadly to spending-based regulations that rely on transactions between affiliated entities.

## 8.3 Policy Implications

The results have implications for the design of spending-based regulation in health insurance markets. Aggregate MLR compliance statistics may overstate the extent to which compliance reflects genuine increases in medical spending. Although more than $13 billion in individual-market MLR rebates have been distributed since 2012, the results suggest that nominal compliance need not always correspond to equivalent increases in care delivered. To the extent that vertically integrated insurers satisfy the threshold through internal financial arrangements rather than genuine reallocation toward patient care, rebate obligations may be reduced without a corresponding increase in consumer welfare.

The mechanism identified here arises because the MLR formula counts payments to affiliated providers as medical claims without requiring arm's-length valuation. Similar concerns have recently been raised in commercial insurance and Medicare Advantage (Frank and Milhaupt, 2023; Angeles and Bailit, 2025; Argüello and Murphy, 2025; Robb and Karcher, 2026). As vertical integration expands (Dafny et al., 2012), regulators may therefore wish to consider enhanced disclosure of affiliated-party transactions, arm's-length valuation requirements, or separate treatment of integrated firms when spending mandates rely on reported internal transactions.

# 9 Conclusion

Whether regulation changes underlying behavior or primarily reported outcomes depends on the tools available to regulated firms. This paper shows that vertically integrated insurers responded differently to the ACA's 80 percent medical loss ratio requirement than traditional insurers. The evidence is consistent with internal transfer pricing serving as a compliance technology and illustrating how organizational form can shape firms' responses to the same regulation..

The findings have broader implications for the design of spending-based regulation. When compliance depends on reported expenditures rather than directly observed outcomes, organizational structure can create compliance technologies that are unavailable to otherwise similar firms. In such settings, nominal compliance may not correspond to equivalent changes in underlying economic behavior. More broadly, the results add a regulatory-arbitrage dimension to the welfare analysis of vertical integration by highlighting how organizational structure can influence the implementation and effectiveness of regulation.

The analysis cannot directly distinguish transfer-pricing adjustments from changes in utilization at affiliated providers, nor does it speak to newer forms of insurer-provider integration that emerged after the ACA. Even with these limitations, the results suggest that organizational form is an important determinant of regulatory effectiveness because it shapes the set of feasible compliance strategies available to regulated firms.

# References

**Abraham, Jean M., Pinar Karaca-Mandic, and Kosali Simon**, "How Has the Affordable Care Act's Medical Loss Ratio Regulation Affected Insurer Behavior?," *Medical Care*, 2014, *52* (4), 370–377.

**Angeles, January and Michael Bailit**, "How Insurers That Own Providers Can Game the Medical Loss Ratio Rules," *Health Affairs Forefront*, September 29 2025.

**Argüello, Andrés and Natasha Murphy**, "Medical Loss Ratio Reform Can Help Curb Corporate Power and Lower Health Care Costs," Center for American Progress October 2025.

**Baker, Laurence C, M Kate Bundorf, and Daniel P Kessler**, "Vertical integration: hospital ownership of physician practices is associated with higher prices and spending," *Health Affairs*, 2014, *33* (5), 756–763.

**Born, Patricia H., E. Tice Sirmans, and Petra Steinorth**, "Health Insurers' Use of Quality Improvement Expenses to Achieve a Minimum Medical Loss Ratio Requirement," *Journal of Risk and Insurance*, 2023, *90* (1), 123–154.

**Callaghan, S. Reed, Elizabeth Plummer, and William F. Wempe**, "Health Insurers' Claims and Premiums Under the Affordable Care Act: Evidence on the Effects of Bright Line Regulations," *Journal of Risk and Insurance*, 2020, *87* (1), 67–93.

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

**Dafny, Leemore**, "How Do Hospitals Respond to Price Changes?," *American Economic Review*, 2005, *95* (5), 1525–1547.

**_ , Kate Ho, and Robin S. Lee**, "The Price Effects of Cross-Market Mergers: Theory and Evidence from the Hospital Industry," *RAND Journal of Economics*, 2019, *50* (2), 286–325.

**_ , Mark Duggan, and Subramaniam Ramanarayanan**, "Paying a Premium on Your Premium? Consolidation in the US Health Insurance Industry," *American Economic Review*, April 2012, *102* (2), 1161–85.

**Eastman, Evan M., David L. Eckles, and Andrew Van Buskirk**, "Accounting-Based Regulation: Evidence from Health Insurers and the Affordable Care Act," *The Accounting Review*, 2021, *96* (2), 231–259.

**Eliason, Paul, Riley League, Jetson Leder-Luis, Ryan C McDevitt, and James W Roberts**, "Ambulance Taxis: The Impact of Regulation and Litigation on Health-Care Fraud," *Journal of Political Economy*, 2025, *133* (5), 1661–1702.

**Frank, Richard G. and C. Milhaupt**, "Related Businesses and Preservation of Medicare's Medical Loss Ratio Rules," Brookings Institution June 2023.

**Gandhi, Ashvin and Andrew Olenski**, "Tunneling and Hidden Profits in Health Care," NBER Working Paper 32258 2024.

**Gaynor, Martin and Amanda Starc**, "Competition in Health Insurance Markets," *Journal of Economic Perspectives*, 2026, *40* (2), 17–42.

**Geruso, Michael and Timothy Layton**, "Upcoding: Evidence from Medicare on Squishy Risk Adjustment," *Journal of Political Economy*, 2020, *128* (3), 984–1026.

**Gupta, Atul, Ambar La Forgia, and Adam Sacarny**, "Turbocharging Profits? Contract Gaming and Revenue Allocation in Healthcare," *American Economic Journal: Applied Economics*, July 2026, *18* (3), 322–61.

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

**Kakani, Pragya, Eric Yde, Genevieve P. Kanter, Richard G. Frank, and Amelia M. Bond**, "Profit Regulation and Strategic Transfer Pricing by Vertically Integrated Firms: Evidence from Health Care," NBER Working Paper 35043, National Bureau of Economic Research 2026.

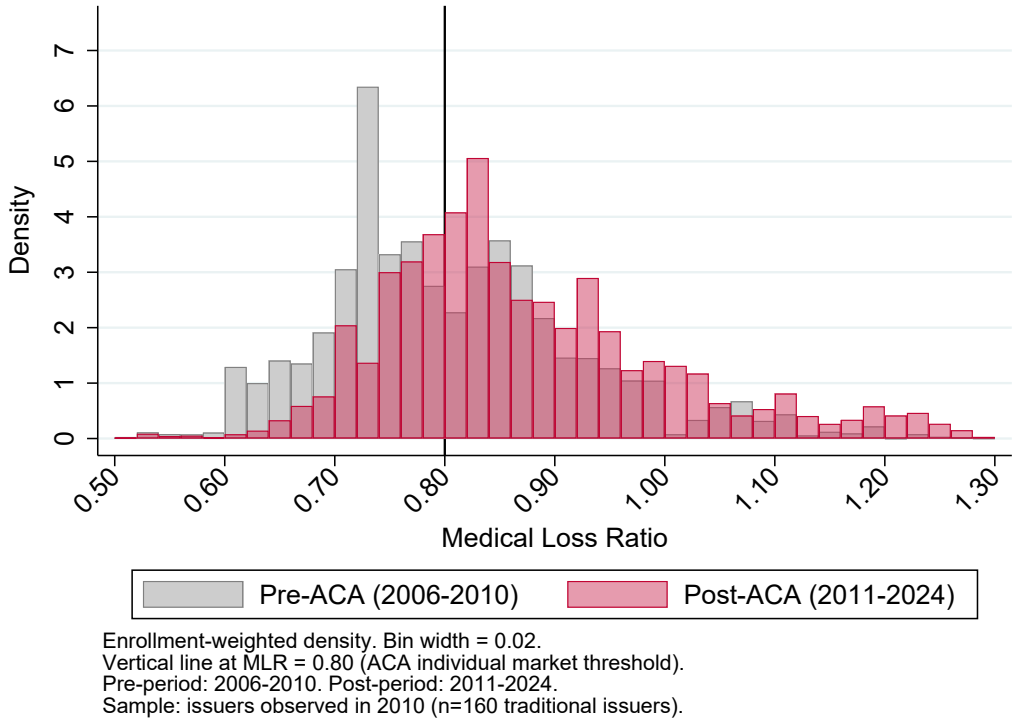
**Karaca-Mandic, Pinar, Jean M. Abraham, and Kosali Simon**, "Is the Medical Loss Ratio a Good Target Measure for Regulation in the Individual Market for Health Insurance?," *Health Economics*, 2015, *24* (1), 55–74.

**Koch, Thomas G., Brett W. Wendling, and Nathan E. Wilson**, "How Vertical Integration Affects the Quantity and Cost of Care for Medicare Beneficiaries," *Journal of Health Economics*, 2021, *80*, 102536.

**Leder-Luis, Jetson and Anup Malani**, "The Economics of Healthcare Fraud," Working Paper 33592, National Bureau of Economic Research March 2025.

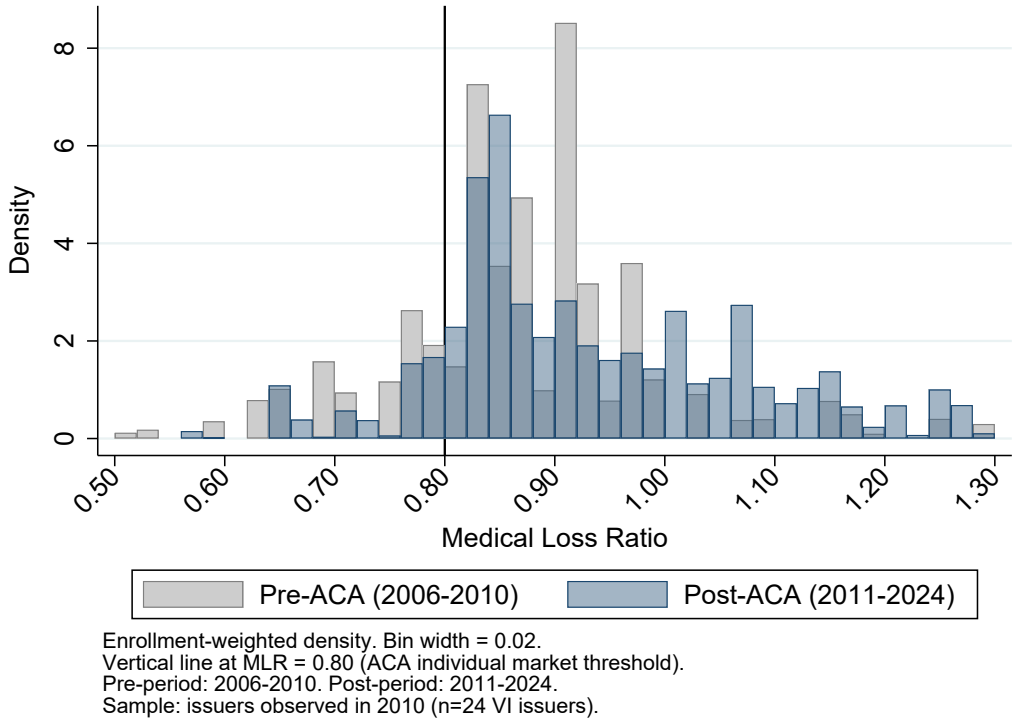
**Robb, Michelle and Jason Karcher**, "Medical Loss Ratio Requirements: Challenges Posed by Vertical Integration," White Paper, Milliman February 2026. Commissioned by PhRMA.

Figure 1: MLR Distribution, Pre- and Post-ACA: Traditional Insurers



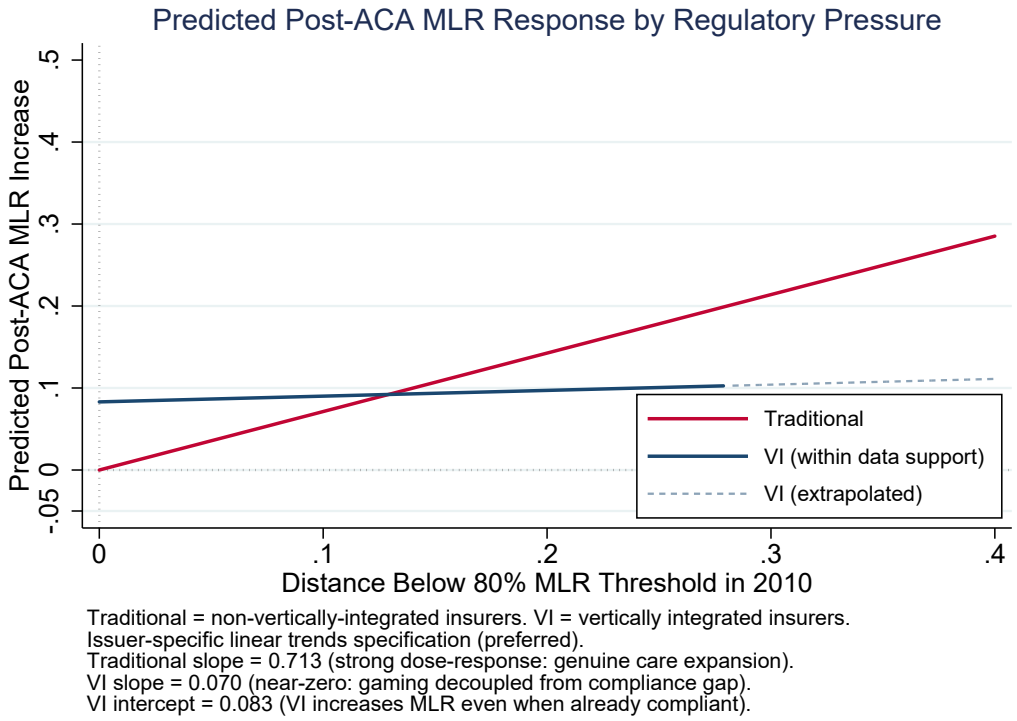

*Notes:* Distribution of medical loss ratios for traditional (non-integrated) insurers, individual market, 2001–2024. Pre-ACA period: 2001–2010. Post-ACA period: 2011–2024. The vertical dashed line marks the 80 percent regulatory threshold.

Figure 2: MLR Distribution, Pre- and Post-ACA: Vertically Integrated Insurers




*Notes:* Distribution of medical loss ratios for vertically integrated insurers, individual market, 2001–2024. Pre-ACA period: 2001–2010. Post-ACA period: 2011–2024. The vertical dashed line marks the 80 percent regulatory threshold.

Figure 3: Predicted MLR Response by Vertical Integration Status and Pre-Regulation Compliance Gap




*Notes:* Predicted post-ACA MLR increase as a function of pre-regulation distance from the 80 percent threshold, separately for traditional and VI issuers, based on Column 4 coefficients from Table 2. Lines cross at approximately 0.13 distance units.

Table 1: Summary Statistics

| Variable | Full Sample | Traditional | VI | Difference |
|---|---|---|---|---|
| *Panel A: Outcome Variables (Issuer-State-Year, $N = 3{,}380$)* | | | | |
| Medical Loss Ratio | 0.873 | 0.861 | 0.939 | 0.076*** |
| | (0.171) | (0.167) | (0.179) | (0.022) |
| Claims per Member-Month ($) | 312.237 | 302.931 | 364.286 | 41.075 |
| | (227.247) | (209.370) | (303.751) | (41.755) |
| Premiums per Member-Month ($) | 354.708 | 347.559 | 394.690 | 23.068 |
| | (250.618) | (227.179) | (351.820) | (46.648) |
| Ambulatory Encounters per Life-Year | 8.305 | 8.621 | 6.495 | −2.313*** |
| | (4.150) | (4.155) | (3.622) | (0.660) |
| Inpatient Admissions per Life-Year | 0.049 | 0.049 | 0.050 | 0.002 |
| | (0.021) | (0.020) | (0.023) | (0.003) |
| Log Enrollment (thousands of life-years) | 2.964 | 3.026 | 2.614 | −0.444** |
| | (1.370) | (1.388) | (1.202) | (0.193) |
| *Panel B: Treatment and Issuer Characteristics (Issuer-State, 2010 Baseline, $N = 204$)* | | | | |
| Distance Below 80% Threshold | 0.048 | 0.052 | 0.024 | −0.028* |
| | (0.079) | (0.079) | (0.074) | (0.016) |
| Nonprofit (= 1) | 0.294 | 0.277 | 0.407 | 0.131 |
| | (0.457) | (0.449) | (0.501) | (0.114) |
| HMO (= 1) | 0.451 | 0.379 | 0.926 | 0.547*** |
| | (0.499) | (0.486) | (0.267) | (0.066) |
| Enrollment (thousands of life-years) | 34.777 | 37.491 | 16.985 | −20.506*** |
| | (59.415) | (63.035) | (16.917) | (6.421) |
| State HHI | 0.489 | 0.500 | 0.415 | −0.085* |
| | (0.248) | (0.250) | (0.222) | (0.046) |

*Notes:* Standard deviations in parentheses for Panel A columns 1–3; standard errors in parentheses for Difference column. Difference column reports OLS coefficient from regressing each variable on a VI indicator.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: MLR Response to Regulation by Organizational Form

| | (1) Cicala Replication | (2) Simple DiD | (3) Triple-Differences | **(4) Preferred** |
|---|---|---|---|---|
| Distance × Post | 0.759*** | — | 0.785*** | 0.699*** |
| (DiD — traditional-insurer baseline) | (0.159) | — | (0.166) | (0.154) |
| Distance × Post × VI | — | — | +0.458* | −0.656*** |
| (triple-difference) | — | — | (0.267) | (0.182) |
| Post × VI | — | 0.059*** | 0.057* | 0.087*** |
| (VI time trend) | — | (0.023) | (0.033) | (0.023) |
| Distance × VI | — | −1.211*** | −0.908*** | −0.994*** |
| (pre-period VI selection) | — | (0.136) | (0.230) | (0.139) |
| Issuer-State FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| Issuer Linear Trends | No | Yes | No | Yes |
| $N$ | 3,380 | 3,380 | 3,380 | 3,380 |
| $R^2$ | 0.460 | 0.599 | 0.463 | 0.605 |

*Notes:* Unit of observation is issuer-state-year, 2001–2024. Column 1 replicates Cicala et al. 2019 in the extended panel. Column 2 presents a simple difference-in-differences comparing VI and traditional insurers post-ACA, identified from all 24 VI clusters. The simple DiD specification includes *post_X_vi* and *dist_X_vi* but omits *dist_X_post* and *dist_X_post_X_vi*; dashes indicate terms not included in that specification. Columns 3 and 4 add the triple-difference design interacting compliance gap with VI status and post-ACA timing. Column 4 is the preferred specification with issuer-specific linear trends. *dist_X_post* denotes the traditional-insurer dose-response. *dist_X_post_X_vi* denotes the VI triple-difference coefficient. *post_X_vi* captures the VI post-ACA intercept independent of the compliance gap. *dist_X_vi* captures pre-period VI selection. Clustered standard errors at the issuer level are reported in parentheses.
$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 3: Mechanism Tests — Utilization and Price Responses

| | (1) Amb. Enc./LY | (2) Admits/LY | (3) Claims/Util | (4) Claims PMPM | (5) Premiums PMPM | (6) Log Enrollment |
|---|---|---|---|---|---|---|
| Distance × Post | 2.429 | 0.018 | 3,552.481** | 277.512** | 137.153 | 2.733*** |
| (DiD — trad. insurer baseline, replicates Cicala) | (3.660) | (0.019) | (1,595.035) | (107.824) | (119.477) | (0.866) |
| Distance × Post × VI | −3.194 | −0.062** | −2,803.463 | −639.290** | −430.903 | 0.929 |
| (triple-difference) | (4.541) | (0.025) | (2,310.063) | (266.568) | (322.148) | (1.974) |
| Post × VI | 0.390 | 0.002 | −37.005 | 42.912 | 31.558 | 0.137 |
| (VI time trend) | (0.777) | (0.004) | (453.843) | (53.217) | (64.505) | (0.184) |
| Distance × VI | −16.177*** | −0.203*** | 1,623.175* | −469.711*** | −357.621*** | −5.714*** |
| (pre-period VI selection) | (2.973) | (0.020) | (901.612) | (128.533) | (131.914) | (0.832) |
| Issuer-State FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Issuer Linear Trends | Yes | Yes | Yes | Yes | Yes | Yes |
| $N$ | 2,888 | 2,863 | 3,232 | 3,380 | 3,380 | 3,380 |
| $R^2$ | 0.772 | 0.712 | 0.700 | 0.834 | 0.829 | 0.849 |

*Notes:* All regressions use the preferred issuer-specific linear trends specification. Clustered standard errors at the issuer (*cocode*) level are reported in parentheses. *dist_X_post* denotes the traditional-insurer response to regulatory pressure. *dist_X_post_X_vi* denotes the vertically integrated insurer differential response (triple-difference). *post_X_vi* captures the baseline post-ACA shift for VI issuers independent of compliance distance. *dist_X_vi* captures pre-period VI selection and strategic pre-ACA suppression.
$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

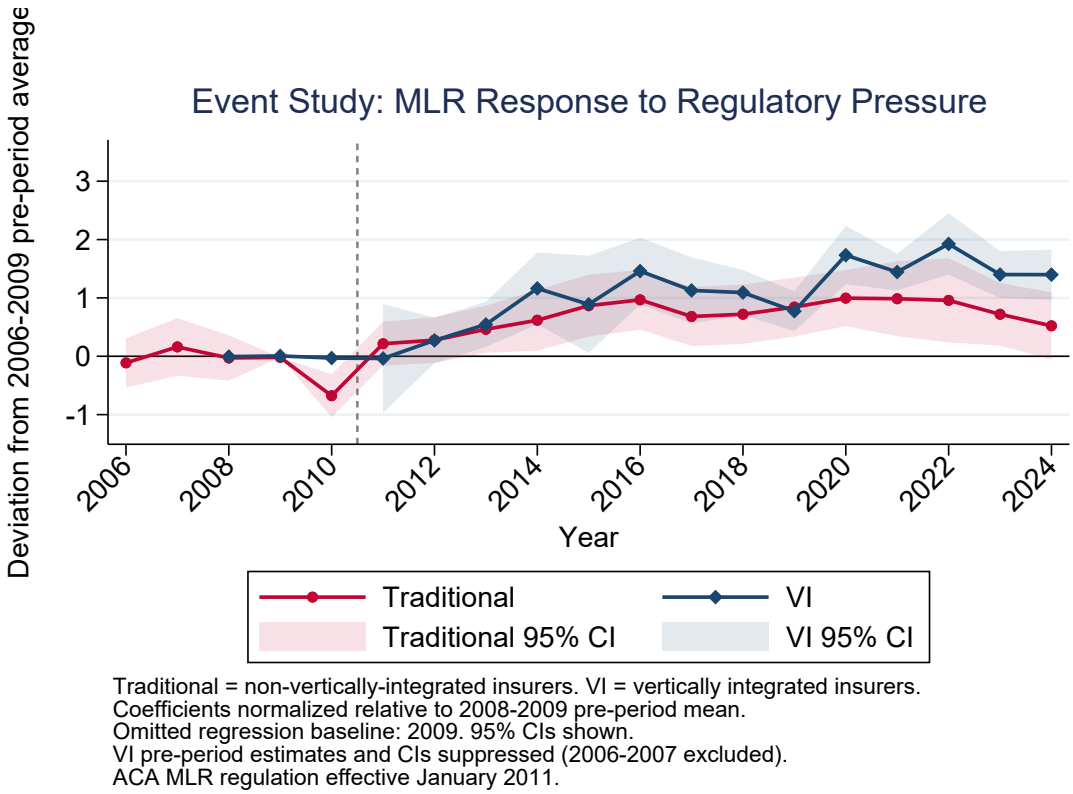
Table 4: Mechanism Analysis — MLR Numerator Decomposition by VI Status

| | (1) MLR | (2) Claims Share | (3) QI Share | (4) Admin Share |
|---|---|---|---|---|
| Distance × Post | 1.154*** | 1.149*** | 0.004** | −0.045 |
| (traditional insurer baseline) | (0.072) | (0.071) | (0.002) | (0.052) |
| Distance × VI | 0.989*** | 1.000*** | −0.010 | 0.135 |
| (pre-period selection) | (0.044) | (0.053) | (0.014) | (0.144) |
| Post × VI | 0.031* | 0.033* | −0.003 | 0.019 |
| (VI baseline shift) | (0.018) | (0.019) | (0.003) | (0.032) |
| Distance × Post × VI | −1.052*** | −1.061*** | 0.008 | −0.014 |
| (triple-diff) | (0.091) | (0.095) | (0.014) | (0.147) |
| Observations | 3,762 | 3,762 | 3,762 | 3,762 |

*Notes:* Unit of observation is issuer-state-year, 2010–2024. Sample restricted to issuers appearing in main NAIC panel ($N$ = 3,762 after dropping singletons). Claims share = incurred claims / adjusted premiums (SHCE line 5.0/1.8). QI share = QI expenses / adjusted premiums (SHCE lines 6.3 or 6.6/1.8). Admin share = (claims adj. exp. + G&A) / adjusted premiums (SHCE lines 8.3+10.5/1.8). $dist = 0.80 - MLR$ (distance to regulatory threshold), winsorized at 1/99. All specifications include issuer-state FE, year FE, and issuer linear trends. Standard errors clustered by issuer.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 4: Event Study — Year-by-Year MLR Coefficients by VI Status, 2001–2024




*Notes:* Year-by-year triple-difference coefficients from equation (2), estimated separately for traditional (non-integrated) and vertically integrated issuers. Coefficients normalized to the 2006–2009 pre-period mean. Omitted baseline year: 2009. Shaded bands indicate 95 percent confidence intervals.

Table 5: Robustness Checks — Two-Way Fixed Effects

| | (1) Large | (2) Balanced | (3) No COVID | (4) No 2014–15 | (5) 2-Way Clust. | (6) 85% Thresh. | (7) 3+ Pre-yrs |
|---|---|---|---|---|---|---|---|
| Distance × Post | 0.513*** | 0.985*** | 0.777*** | 0.782*** | 0.785*** | | 0.648*** |
| (traditional baseline) | (0.168) | (0.223) | (0.167) | (0.167) | (0.164) | | (0.177) |
| Distance × Post × VI | 2.472*** | 2.459*** | 0.374 | 0.471* | 0.458* | | 2.717*** |
| (triple-diff: VI gaming) | (0.435) | (0.727) | (0.237) | (0.248) | (0.241) | | (0.717) |
| Post × VI | 0.020 | 0.077* | 0.062* | 0.061* | 0.057** | 0.068* | 0.056 |
| (VI baseline shift) | (0.023) | (0.040) | (0.034) | (0.033) | (0.027) | (0.036) | (0.037) |
| dist85 × Post | | | | | | 0.696*** | |
| | | | | | | (0.136) | |
| dist85 × Post × VI | | | | | | 0.334 | |
| | | | | | | (0.256) | |
| Sample | ≥10K lives | Balanced panel | Excl. 2020 | Excl. 2014–15 | Full sample | Full sample | 3+ pre-yrs |
| Issuer Trends | No | No | No | No | No | No | No |
| $N$ | 2,308 | 2,217 | 3,261 | 3,058 | 3,380 | 3,380 | 2,938 |
| $R^2$ | 0.561 | 0.439 | 0.468 | 0.467 | 0.463 | 0.467 | 0.453 |

*Notes:* All regressions include issuer-state FE and year FE. Clustered SEs at issuer (cocode) level except Col. 5 (issuer × state). Cols. 1–5, 7: threshold = 80%. Col. 6: threshold = 85% (*dist85* variables shown). Post Schedule Y verified sample (24 VI cocodes). *dist_X_post* = traditional insurer dose-response (replicates Cicala et al. 2019). *dist_X_post_X_vi* = VI triple-diff (key coefficient). *post_X_vi* = VI baseline post-ACA shift independent of distance.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Robustness Checks — Preferred Specification (Issuer Trends)

| | (1) Large | (2) Balanced | (3) No COVID | (4) Pre-2014 | (5) 3+ Pre-yrs |
|---|---|---|---|---|---|
| Distance × Post | 0.618*** | 0.912*** | 0.702*** | 0.699*** | 0.707*** |
| (traditional baseline) | (0.149) | (0.240) | (0.155) | (0.154) | (0.198) |
| Distance × Post × VI | 0.701 | 0.744 | −0.605*** | −0.656*** | 0.655 |
| (triple-diff: VI gaming) | (0.640) | (0.597) | (0.206) | (0.182) | (0.557) |
| Post × VI | 0.082*** | 0.105*** | 0.088*** | 0.087*** | 0.090*** |
| (VI baseline shift) | (0.031) | (0.025) | (0.023) | (0.023) | (0.024) |
| Sample | ≥10K lives | Balanced panel | Excl. 2020 | Pre-2014 entrants | 3+ pre-yrs |
| Issuer Trends | Yes | Yes | Yes | Yes | Yes |
| $N$ | 2,308 | 2,217 | 3,261 | 3,380 | 2,938 |
| $R^2$ | 0.680 | 0.576 | 0.611 | 0.605 | 0.589 |

*Notes:* All regressions include issuer-state FE, year FE, and issuer-specific linear trends. Clustered SEs at issuer level. Post Schedule Y verified sample (24 VI cocodes). Benchmark (full sample, Col. 4 of Table 2): $dist_X_post = 0.699^{***}$, $dist_X_post_X_vi = -0.656^{***}$. Issuer trends absorb differential pre-existing trajectories in these subsamples. Cols. 3–5: key result stable and significant across all checks. $dist_X_post$ = traditional insurer dose-response (replicates Cicala et al. 2019). $dist_X_post_X_vi$ = VI triple-diff (key coefficient). $post_X_vi$ = VI baseline post-ACA shift independent of distance.
$^{*}$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$

# A Vertical Integration Classification Procedure

I identify vertically integrated issuers using a two-step procedure applied to NAIC company names. In the first step, I construct a standardized company name string and apply string-matching rules to flag issuers affiliated with well-documented provider-sponsored health plan systems, including large integrated delivery networks and hospital-system-affiliated plans operating in the individual market. Several rules include state restrictions to avoid false positives from common names. In the second step, I supplement the automated string-matching with a manually verified issuer crosswalk that codes additional issuers not captured by the automated rules, with manual classifications taking precedence where they overlap. I classify an issuer as VI if its organizational parent is a health care delivery system rather than a standalone insurance company.

Table A1: Mechanism Analysis: MLR Numerator Decomposition by VI Status (Two-Way Fixed Effects)

| | (1) MLR | (2) Claims Share | (3) QI Share | (4) Admin Share |
|---|---|---|---|---|
| Distance × Post | 1.224*** | 1.221*** | 0.002 | 0.006 |
| (traditional insurer baseline) | (0.075) | (0.074) | (0.002) | (0.071) |
| Distance × VI | 1.019*** | 1.046*** | −0.026*** | −0.093 |
| (pre-period selection) | (0.011) | (0.013) | (0.007) | (0.084) |
| Post × VI | 0.063*** | 0.070*** | −0.007*** | 0.035 |
| (VI baseline shift) | (0.022) | (0.022) | (0.003) | (0.029) |
| Distance × Post × VI | −1.168*** | −1.193*** | 0.026*** | 0.133 |
| (triple-diff) | (0.063) | (0.064) | (0.007) | (0.107) |
| Observations | 3,762 | 3,762 | 3,762 | 3,762 |
| $R^2$ | 0.735 | 0.736 | 0.598 | 0.408 |

*Notes:* Unit of observation is issuer-state-year, 2010–2024. Sample restricted to issuers appearing in main NAIC panel. Post Schedule Y verified sample (24 VI cocodes). Claims share = incurred claims / adjusted premiums (SHCE line 5.0/1.8). QI share = QI expenses / adjusted premiums (SHCE lines 6.3 or 6.6/1.8). Admin share = (claims adj. exp. + G&A) / adjusted premiums (SHCE lines 8.3+10.5/1.8). $dist = 0.80 - MLR$ (distance to regulatory threshold), winsorized at 1/99. All specifications include issuer-state FE and year FE. No issuer linear trends. Standard errors clustered by issuer.
$^{*}$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$

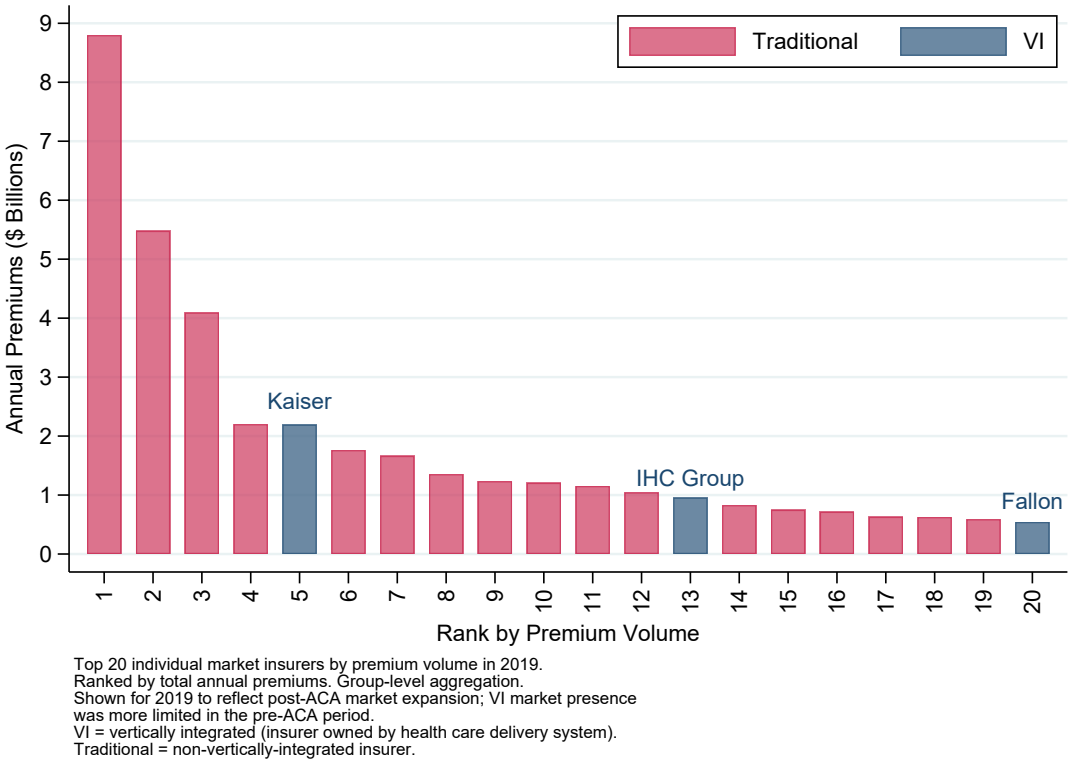



Figure A1: Individual Market Premium Volume by Insurer Group, 2019

*Notes:* Annual premium volume by insurer group in the individual market, 2019. Kaiser Foundation ranked fifth among all individual market participants with $2.2 billion in premium volume.

Table A2: Illustrative Evidence on Intercompany Financial Flows: Geisinger Health Plan

| **Fiscal Year** | **Premiums** | **IC Shared Services** | **Inter-Entity Expense** | **Parent Transfer** |
|---|---|---|---|---|
| FY2009 | \$812.3M | \$41.2M | \$33.3M | \$36.0M |
| FY2010 | \$871.3M | \$52.7M | \$45.3M | \$48.0M |
| **FY2011** | **\$915.1M** | **\$74.1M** | **\$54.7M** | **\$37.0M** |
| FY2012 | \$1,121.0M | \$82.3M | \$32.2M | ≈\$0 |
| FY2017 | \$2,102.5M | \$72.3M | \$37.8M | \$12.7M |
| *Growth FY2009–FY2011* | +12.7% | +80.0% | +64.3% | −2.8% |

*Notes:* Data are from IRS Form 990 filings for Geisinger Health Plan (EIN 23-2311553). FY2011 (bolded) is the first full fiscal year after ACA MLR implementation. IC Shared Services denotes related-party service revenue reported on Form 990; Inter-Entity Expense denotes payments to affiliated entities; Parent Transfer denotes transfers to affiliated foundations or parent organizations. Source: IRS Form 990 filings.