THE PENNSYLVANIA STATE UNIVERSITY
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THE RAMIFICATIONS OF PRIVATE HEALTH INSURANCE MARKET CONCENTRATION ON PREMIUMS AND ACCESS ACROSS U.S. ACA REGIONS: A QUANTITATIVE LONGITUDINAL ANALYSIS

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ABSTRACT

The health insurance market in the United States has changed radically following the adoption of the Affordable Care Act (ACA). Although the ACA introduced competitive Marketplaces intended to boost consumer choice and affordability, increased consolidation among private insurance companies has raised emerging policy and welfare issues. My dissertation examines the effect of market concentration among private insurers, quantified by the Herfindahl–Hirschman Index (HHI), on performance in the Affordable Care Act (ACA) marketplaces and tests access to downstream health care as a validation. Using an extensive set of county-level data compiled for the 2014-2024 period from the CMS Marketplace Public Use Files and related federal datasets like the American Medical Association (AMA), Healthcare Cost and Utilisation Project (HCUP), CDC WONDER, and Small Area Health Insurance Estimates (SAHIE), my research uses enrollment-weighted and unweighted measures of concentration to assess the effect of insurer concentration on performance.

My empirical strategy is based upon assessing the effects of insurer concentration on Marketplace performance, in terms of benchmark premiums (the second lowest-cost silver plan) (SLCSP), issuer participation, and plan availability, using Two-Way Fixed Effects (TWFE) panel models and staggered Difference-in-Differences (DiD) designs that isolate competition shocks.

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Lastly, I appreciate my peers and colleagues for providing comments on the tested assumptions and for improving my writing. The patience and support of my family and friends are recognized, as their encouragement kept me on track throughout the data construction, model testing, cleaning, and revision processes. Any other mistakes are on me.

Chapter 1

Introduction

The Patient Protection and Affordable Care Act (ACA) was enacted with the clear intention of increasing insurance coverage and promoting regulated competition to offset high prices, enhance consumer choice, and improve access to care (ACA, 2010; Bhattacharya et al., 2013). Leading to the establishment of Health Insurance Marketplaces -organized exchanges where the private insurers would compete over enrollees while following established benefit designs, guaranteed issue, and community rating. The ACA aimed to replicate the welfare-promoting effects of market competition observed in other insurance markets by reducing entry barriers and enhancing price transparency and by addressing debacle in the pre-ACA period, including adverse selection and denials of coverage (Cutler & Gruber, 1996; McGuire et al., 2018). What has become coherent ten years after implementation, however, is that the competitive reality of the ACA Marketplace bears little resemblance to its theoretical design. Most local markets have become highly concentrated, with one or two insurers, rather than converging to competitive equilibria. The available empirical data on insurers' enrollments consistently demonstrate that a significant proportion of counties exhibit market concentration levels beyond the standard antitrust threshold of concern (DOJ–FTC, 2023). In many regions, particularly in low-population and rural counties, consumers have limited choice of insurers, even though they formally participate in the Marketplace.

I have tried to elucidate this issue through my thesis. Based on county-level enrollment data for 2014-2024, the number of insurers competing in the market is substantially higher than during the initial ACA rollout. Yet market concentration remains adamantly high (CMS, 2024). Even in 2024, average concentration remained well above levels traditionally considered indicative of competitive markets. The ACA Marketplace is a paradox: a policy structure clearly aimed at encouraging competition has, in practice, created a differentiated oligopolistic market structure. It is thus essential to understand the implications of this policy, not only to assess the ACA's performance but also to inform further discussions on insurer consolidation, antitrust enforcement, and health policy architecture.

1.1 Does Competition Matter

A substantial body of literature indicates that higher insurer concentration is associated with higher premiums, weaker price discipline, and greater market power. The randomized studies by Dafny, Duggan, and Ramanarayan (2012; 2015) demonstrate that insurance market consolidation results in statistically and economically significant premium increases in both employer-sponsored and individual insurance markets. Such results are consistent with the classical theory of industrial organization: as competition decreases, insurers' bargaining power increases, allowing them to raise prices without corresponding increases in value. Those concerned with the ability to pay, however, should not ignore the broader welfare implications of insurer market power. Health insurance is not merely a price product; insurers compete and wield power through myriad non-price margins. These are the breadth of provider network, cost-

sharing arrangements, utilization management, and administrative impediments to care. In cases where competition is weak, insurers can respond by raising premiums, reducing networks, decreasing deductibles, limiting access to specialty care, or cutting incentives for preventive care.

These mechanisms have implications that extend beyond affordability to health outcomes themselves. Minimal access to primary care, increased out-of-pocket expenses, and provider networks criticize access to care that might delay diagnosis, exacerbate chronic illness, and cause preventable hospitalizations. Nevertheless, although these avenues are plausible, there remains a lack of empirical data on the relationship between insurer concentration and population health outcomes.

1.2 Endogeneity and Reverse Causality

The causal impact of insurance companies' concentration on health outcomes poses a significant empirical challenge. Basic correlations between concentration and adverse outcomes cannot establish causality because insurer involvement is endogenous and subject to local market conditions. Regions with poorer populations, higher provider costs, or higher activity levels could be unattractive to insurers, prompting insurers to exit. In that context, increased concentration can be an outcome, rather than a cause, of adverse health outcomes.

Reverse causality introduces an inherent identification problem. Unless empirically designed, analyses can infer poor health outcomes from insurer concentration when the insurance is, in reality, driven by underlying cost or risk factors. High rates of entry and exit characterized the initial period of the Marketplace, as insurers assessed enrollee risk profiles, refined pricing

strategies, and responded to changes in federal and state policy. Moreover, estimates can be biased by omitted variables, such as provider market power (no. of firms), regional patterns of practice, or unobserved socioeconomic factors, unless they are well controlled for.

1.3 My Research Question

My thesis research question, which I will try to answer to the best of my ability, is:

Does higher insurer market concentration in the Affordable Care Act (ACA) Marketplace — measured by the Herfindahl-Hirschman Index (HHI) at the county level — lead to higher insurance premiums, reduced plan choice, and suppressed insurer entry across U.S. states? The analysis also assesses whether shifts in insurer involvement, especially the entry of UnitedHealthcare into the market, influence pricing dynamics and downstream health outcomes, after adjusting for socioeconomic, demographic, and healthcare system factors.

Chapter 2

Literature Review

This chapter reviews classical economic theory and current empirical research on the causal framework linking insurance market structure, pricing behavior, and, most importantly, healthcare outcomes.

My review is structured on five thematic sections: (1) fundamental economic theory of the concentration, entry, and strategic behaviour of the market; (2) empirical effectiveness of concentration on premiums and cost-sharing; (3) non-price aspects of competition, such as network adequacy and administrative complexity; (4) new, but still sparse, research on the association between insurance market structure and morbidity and mortality; and (5) research methodology and limitations of current econometric analyses.

The literature draws on high-impact peer-reviewed journals such as the American Economic Review, Journal of Political Economy, Journal of Health Economics, and Health Affairs. It also facilitates the synthesis of data-based reports prepared by the Centers for Disease Control and Prevention (CDC), the Agency for Healthcare Research and Quality (AHRQ), and the Centers for Medicare & Medicaid Services (CMS). My thesis will fill that gap by applying rigorous econometric methods at the intersection of industrial organization and epidemiology.

2.1 Theoretical Framework: Market Power, Entry, and Conduct

The market structure, the threat to entry, and the information asymmetries that characterize the healthcare industry dictate the behavior of health insurers.

The classical starting point is the Bain Structure-Conduct-Performance (SCP) paradigm (1956), which assumes that the resulting market structure is characterized by high market concentration and non-competitive behavior, thereby creating allocative inefficiency and lowering consumer welfare. The possibility of welfare loss in concentrated markets is especially acute in the health insurance context, where demand is infamously inelastic due to the necessity of health care.

Tirole (1988) goes further and determines strategic behavior in oligopolistic environments. In highly concentrated markets, which are often the case in the United States, the American Medical Association (AMA, 2023) reports that 73% of Metropolitan Statistical Areas (MSAs) are highly concentrated and that firms can tacitly conspire. They can avoid price wars by dividing the market geographically, thereby avoiding direct competition. According to this theoretical model, the lack of intense competition means that strong insurers have little incentive to pass negotiated savings from providers to consumers, instead keeping them as profit.

2.1.1 Entry Thresholds

One of the critical theoretical frameworks of my thesis comes from Bresnahan and Reiss (1991) on market entry and rivalry in concentrated markets. The assumption that the market is less robust as the number of firms is less than assumed is refuted in their seminal work. They can illustrate how the competition behavior of firms varies by examining entry thresholds, which is the number of people needed to sustain a certain number of firms (population size), and by reviewing entry thresholds, they can show that the entry of the second and third firms is the most dramatic.

They conclude that, beyond a certain threshold (e.g., three to four firms), the marginal competitive effect of entry is substantially reduced. This means there is no linear relationship between welfare outcomes and market concentration. In the health insurance market, this theory implies that the gap between a monopoly (a single insurer) and a duopoly is substantially more consequential for consumer welfare than the gap between a market with five insurers and one with six insurers. The theoretical insight is crucial to my research hypothesis.

2.1.2 Natural Monopoly and Adverse Selection

Insurance market consolidation is not purely on anti-competitive grounds. According to Kong, Layton, and Shepard (2024), the theory of adverse selection forms the background of a counter-narrative. Their argument rests on the claim that insurance markets tend toward a natural monopoly. Adverse selection may occur in a competitive environment with several insurers: sicker, more expensive patients may be pooled into the most generous plans, raising premiums and even leading to a death spiral for those plans.

Kong et al. suggest larger, unified insurers can pool risks and subsidize enrollees, which is likely costly. Whereas the SCP paradigm posits that consolidation is detrimental to consumers because it confers market power (higher prices), the adverse selection literature posits that consolidation is advantageous to consumers because it enhances stability and risk insurance. This is supported by Geruso and Layton (2017), who argue that policy solutions to the issue should reconcile the trade-offs between the advantages of competition and the inefficiencies of selection. My thesis recognizes this tension and examines whether the stability challenged by the dominant insurers leads to improved health outcomes, or whether market-power effects prevail.

2.1.3 Information Frictions and Behavioral Economics

Standard economic models assume rational consumer choice. This assumption by Handel and Kolstad (2015) is refuted in the context of health insurance, as the authors show that consumers face severe information frictions. Choosing insurance products, due to factors such as deductibles, coinsurance, formularies, and networks, leads to limited rationality.

Loewenstein et al. (2013) argue that in concentrated markets, major insurers lack incentives to streamline these products. Obfuscation may be a profit-maximizing tool to lower price elasticity and switching costs. If consumers cannot accurately assess value, they may be left with suboptimal plans that impose financial constraints on care.

(Bloomberg News, 2017)

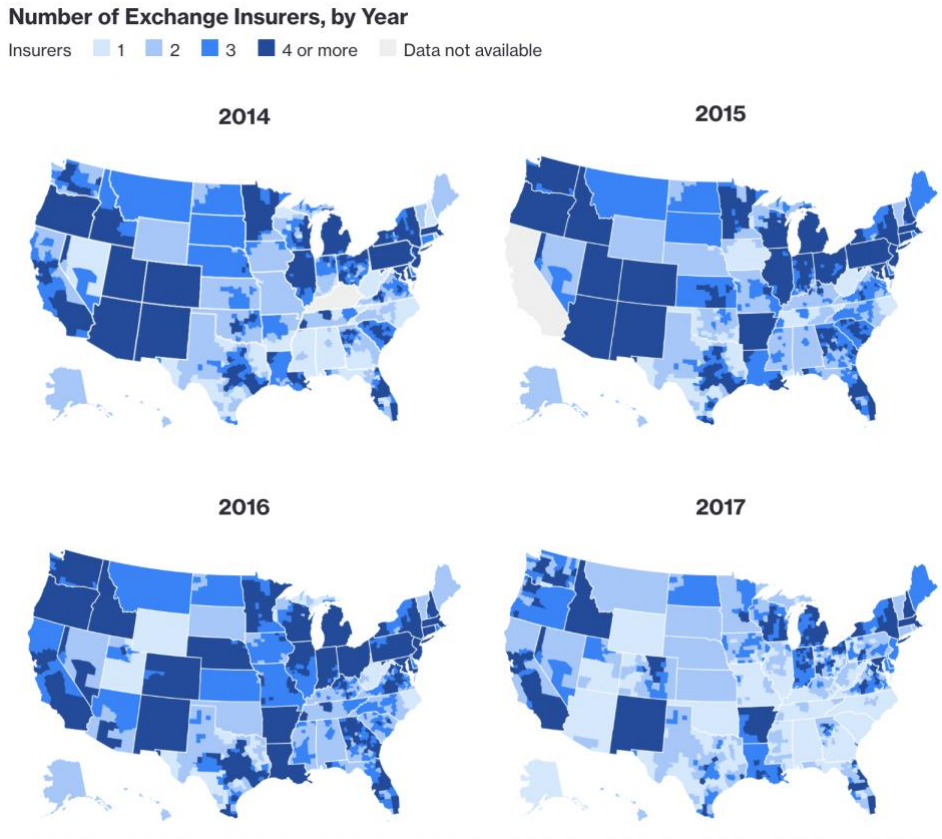


Figure 2-1

2.2 Consolidation, Premiums, and Participation

Empirical research on the financial implications of insurance market structure is robust and well established. It has been agreed that higher concentrations are associated with higher premiums. Still, the extent and mechanism vary by regulatory environment (Employer-Sponsored Insurance and the ACA Marketplaces).

2.2.1 Premium Effects in Commercial Markets

One of the most frequently cited empirical studies on insurance consolidation is by Dafny, Duggan, and Ramanarayan (2012). They use a large sample of employer-sponsored plans and leverage a merger between two large national insurers to harmonize the causal effect on premiums. Their results are stark: the merger led to a premium increase of about 7 percent in markets with significant overlap between the two companies. They did not identify any evidence that the merger resulted in greater monopsony power (reduced payments to providers) that was extended to the consumers. Instead, the greater market power was essentially against consumers.

This observation found a positive relationship between higher Herfindahl-Hirschman Index (HHI) values and higher premiums in the commercial industry. The theory behind this is simple: when there is no competition, insurers will be willing to sell at a price above marginal cost.

2.2.2 Competition in the ACA Marketplaces

The Affordable Care Act (ACA) was introduced as a natural experiment to test these theories in a controlled setting. Jacobs, Banthin, and Trachtman (2015) compared premiums in the Federally Facilitated Marketplaces. The researchers found that adding a second insurer reduced premiums by 5.4%. This result is a strong indication of the Bresnahan and Reiss (1991) theory on the early entrants. Abraham, Drake, McCullough, and Simon (2017) find that indulgence depends heavily on prior profitability and regulatory uncertainty. In their article, they point out that market instability is brought about by churn in insurer participation. When insurers leave because they lose financial stability, they are not being strategic, and this reflects a failure of their competitive edge.

Scheffler et al. (2016) differentiate between types of insurers. They establish that this competitive impact is significant when Medicaid Managed Care Organizations (MMCOs) enter the market and compete with commercial insurers. This implies that the market composition matters as much as the raw HHI. Lower cost structures and different provider networks are standard for MMCOs and are pressuring prices downward, which a legacy commercial entrant may not be able to do.

2.2.3 The Functions of Subsidies and Plan Design

Coverage under the ACA often obscures the sticker price of insurance under the new legislation. Frean, Gruber, and Sommers (2017) analyze the effects of the ACA and find that, despite the ACA's primary influence on coverage growth, underlying gross premiums remain sensitive to competition.

The article by Branham and DeLeire (2019) explores the effects of zero-dollar premium plans. These plans increase enrollments; however, they are usually associated with high deductibles. Anderson, Abraham, and Drake (2019) continue to discuss the affordability factor, noting that, in concentrated rural markets, even subsidized plans may be unaffordable due to high cost-sharing. A key point raised in this literature is that high nominal coverage rates in concentrated markets can be misleading, as they obscure substantial underinsurance when the cost of use (e.g., deductibles, copayments) becomes a barrier to care.

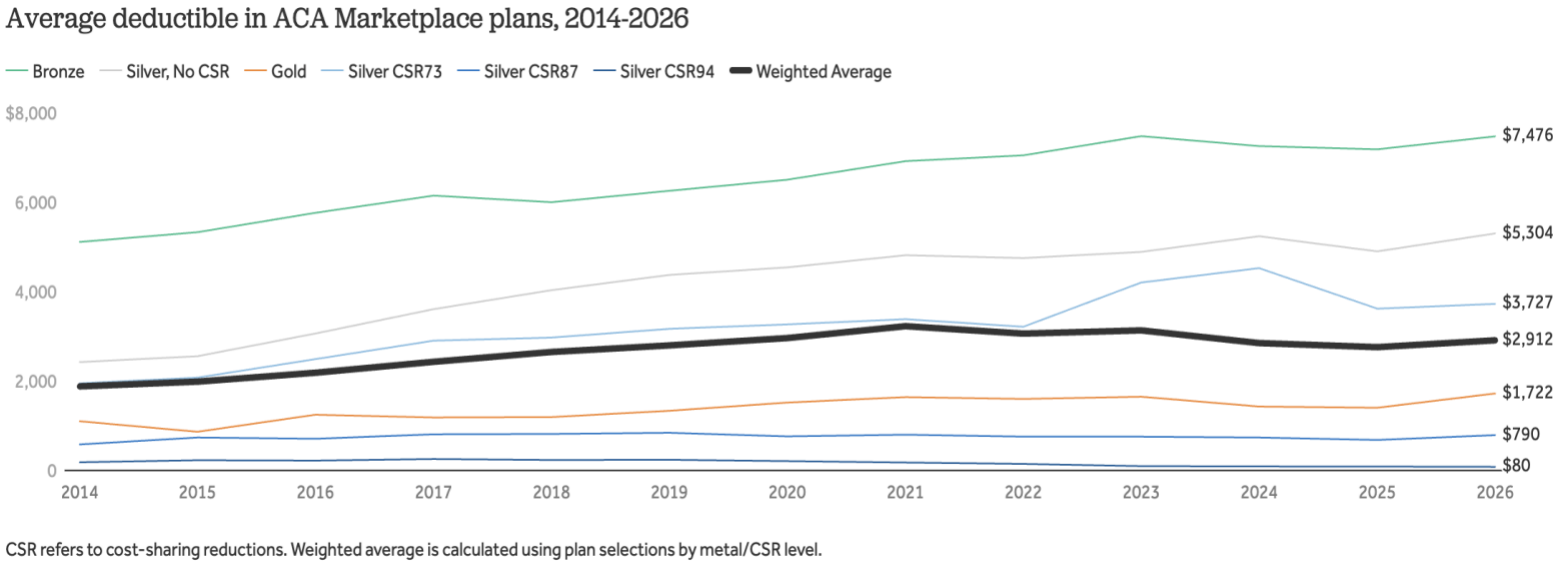


Figure 2-2

Source: Peterson-KFF Health System Tracker (2026)

2.2.4 Cross-Market Interactions with Providers

Insurance markets do not exist in isolation. They dynamically interact with provider markets. Boozary, Feyman, Reinhardt, and Jha (2019) investigate the interplay between hospital

concentration and insurance premiums. They discover that higher provider prices in concentrated provider markets are commonly passed on to consumers by insurers.

Nevertheless, Melnick and Fonkych (2016) conclude that the dominant insurers can also bargain with hospitals for reduced rates. Still, they do not often pass these benefits on to consumers through lower premiums. Instead, the excess is held back.

2.2.5 Narrow Networks and the Phantom Providers

The insurance may also opt to compete (or maximize profit) in concentrated markets by hollowing out benefits rather than reducing prices. Dafny, Hendel, Marone, and Ody (2017) investigate the popularity of the narrow networks on the exchanges. They find that narrower networks may be associated with lower premiums, but they are at high risk of access barriers, particularly for specialists and mental health services.

Polsky (2015) and Giovannelli (2022) highlight the problem of network adequacy in uncompetitive markets. Regulators in high HHIs often struggle to impose network standards because consumers have no other plans to switch to. This results in so-called phantom networks, where provider directories list physicians who are not accepting new patients. This narrowing of the network is one of the key ways in which market concentration would undermine health outcomes.

2.2.6 Geographic and Rural Inequalities

Anderson, Abraham, and Drake (2019) note an apparent rural-urban disparity. Rural markets are more naturally concentrated due to lower population density—all these areas face a double burden of high prices and fewer providers.

2.3 Investigations into Health Outcomes and Mortality

The missing link in the existing literature is the lack of a direct relationship between insurer market structure and objective measures of population health. Economists have focused on prices, and the economic determinants of health have received less attention.

2.3.1 Mortality and Morbidity

A breakthrough study by Abaluck et al. (2021) estimates the impact of plan choice on mortality. They conclude that choosing a lower-quality plan over a higher-quality option may increase mortality, primarily due to limited hospital access and formulary restrictions. This observation is critical: the authors found that insurance plan characteristics are not only financial products but also determinants of life expectancy. Nevertheless, Abaluck was interested in plan choice, not market concentration per se; I address this by examining Medicaid managed care.

2.3.2 International Comparisons

Comparative health systems research confirms the significance of market structure. According to OECD (2022) research, systems that have managed competition and multiple

working insurers (e.g., the Netherlands, Germany) achieve better results on avoidable mortality and hospital readmission than the U.S. These systems use structured competition to drive quality improvement. Conversely, such competition is usually stifled in the U.S. market by consolidation.

2.4 Methodological Developments and Challenges

The development of my thesis's methodological approach is reflected in the evolution of econometric methods documented in the cited literature.

2.4.1 Identification Strategies

The initial research on market concentration used direct cross-sectional regressions, which are invalid due to omitted variable bias (e.g., a region may have high costs because of an unhealthy population, rather than because of a high HHI). It has now become more of a Difference-in-Differences (DiD) and Instrumental Variables (IV) approach.

As an endogeneity instrument, Agridas, Krebs, and Yano (2019) use UnitedHealthcare's market entry as an instrument to estimate competitor effects. Goldsmith-Pinkham, Sorkin, and Swift (2020) provide guidance on using Bartik tools to identify exogenous changes in market structure.

2.4.2 The Problem

Callaway and Sant'Anna (2021), Sun and Abraham (2021), and Baker, Larcker, and Wang (2022) have identified bias in traditional two-way fixed effects (TWFE) models when treatment timing (e.g., a merger) differs across units. They show that, in the presence of heterogeneous treatment effects over time, ordinary TWFE estimators may yield biased estimates, including estimates with the wrong sign.

My thesis addresses this limitation by using dynamic treatment effect estimators developed by Callaway and Sant'Anna.

2.4.3 Removing the Endogeneity Problem

One of the biggest threats to validity is endogeneity: insurers may enter markets because of profitability (simultaneity bias), or unknown factors (e.g., population health) may affect both premium levels and concentration (omitted variable bias).

Instrumental Variable (IV) strategies are used to solve this. Agirdas, Krebs, and Yano (2019) introduce an exogenous market-structure shock by modeling the sudden, strategic departure of UnitedHealthcare from ACA exchanges. Since the departure was not due to local market conditions but to corporate strategy, it is an appropriate tool to assess the causal influence of concentration.

Moreover, new econometric methods by Callaway and Sant'Anna (2021) address biases in Difference-in-Differences (DiD) models with staggered treatment timing. My thesis uses such strong estimators to ensure that the estimated consolidation effects are causal.

2.5 Gaps and My Dissertation

Even within the current literature, my thesis will address some gaps. Dafny et al. and Jacobs et al. have exhaustively mapped price effects, whereas Abaluck et al. have examined mortality only briefly at the plan level. My thesis will use CDC data to show the absence of a macroeconomic connection. My study moves beyond linear regression by following the theoretical lead of Bresnahan and Reiss (1991) and the threshold estimation theory developed by Hansen (2000). Previous research by Anderson et al. (2019) finds rural/urban divisions, but few studies incorporate these and/or racial interaction effects in insurance consolidation.

Drawing on the stringent market-entry theories of Bresnahan and Reiss and the participation mechanisms outlined by Abraham et al. in epidemiology, my thesis hopes to offer a fresh, multidimensional perspective on how the insurance industry influences the country's health.

Chapter 3

Methodology

My thesis follows a quantitative, econometric research design to study the impact of insurer marketplace concentration within the Affordable Care Act (ACA) Marketplaces on overall market performance and downstream healthcare access and coverage outcomes. The empirical design will have primary outcomes of the Marketplace (benchmark premiums, issuer participation, and plan availability) as the key objects of my study. Downstream health and access outcomes are treated as validation endpoints rather than primary causal outcomes, and population health is subject to multiple pathways, not only those related to Marketplace structure. My research design assumes a panel fixed-effects structure and employs a competition-shock analysis driven by insurer entry and exit. This mixed econometric design maximizes causal interpretation by leveraging within-market variation over time, while accommodating persistent, unobserved heterogeneity across geographical units. The datasets aggregate secondary administrative and public-use data into county-year or rating-area-year panels for 2014-2024, reflecting the first years of institutional backlash following recent years of partial deconcentration.

My analytic dataset will be created using several Centers for Medicare & Medicaid Services (CMS) Marketplace Public Use Files (PUFs), including Issuer Participation, Benchmark Premium (Second Lowest-Cost Silver Plan, SLCSP), Plan Attributes, Issuer-Level Enrollment, Service Area, and Plan ID Crosswalk files. Such Marketplace-focused framing avoids the trap of interpreting insurance concentration at an excessively granular level and is consistent with the ACA Marketplace literature, which emphasizes issuer participation, premium benchmarks, and plan structure as key indicators of market performance. Programmatic downloading, cleaning,

and harmonization of the CMS PUFs into a single analysis panel using geographic identifiers (county FIPS codes and/or rating areas), year identifiers, and issuer identifiers are used to collect data. Market concentration is measured using the Herfindahl-Hirschman Index (HHI), computed from enrolment-weighted issuer shares, which is the dominant measure of the intensity of competition in terms of which the average enrollee competes. Robustness tests use premium-weighted shares to assess sensitivity to different weighting schemes. Antitrust thresholds are calculated by the DOJ-FTC Merger Guidelines, which define markets with an HHI ≥ 1,800 as highly concentrated; my results are reported using the classical 2,500 threshold to align with prior literature.

My empirical approach would occur in 2 parts. Part A approximates the Marketplace performance outcomes to the insurer concentration. These tests are based on fixed-effects panel regressions and staggered Difference-in-Differences (DiD) designs, which leverage plausibly exogenous competition shocks from insurers' entry and exit across markets that occur at different times. The irregular timing of the treatment demands the use of modern DiD estimators, which address biases inherent in the conventional two-way fixed-effects models. Part B assesses whether observed changes in the performance of the Marketplaces are consistent with downstream outcomes of insurance coverage and access, which are not causal. This sequencing would describe the causal process and limit over-interpretation in cases where outcomes depend on factors beyond the Marketplace structure.

The econometric base specification of the performance of the Marketplace is:

$$ln(Premium_{it}) = \beta_0 + \beta_1 HHI_{it} + \gamma X_{it} + \alpha_i + \delta_t + \varepsilon_{it}$$

Where i classify geographic markets and t indexes years; HHI_it is insurer concentration; X_it is a time-varying control vector; α_i reflects market fixed effects that capture time-invariant

features such as urban-rural status, and δ_t reflects year fixed effects including national policy and macroeconomic shocks. The analytic sample will be population-based rather than survey-based. It will include all geographic units in the CMS Marketplace PUFs that meet the inclusion criteria, including, but not limited to, defined service areas, non-missing benchmark premiums, and linkable issuer identifiers. Depending on data availability and suppression, the panel I generate will be balanced or unbalanced, and it typically contains thousands of geography-year observations. Since CMS PUFs cover nearly all activity in the Marketplace, my design does not emphasize statistical sampling-based inference; instead, it focuses on the representativeness of the ACA Marketplace. All data handling and estimation is implemented using Stata and/or R/Python, including crosswalk-based merging, HHI construction, and econometric analysis. Statistical inference is based on linear and log-linear fixed-effects models with fixed-level cluster-robust standard errors, staggered DiD event-study estimators with pre-trend diagnostics, and sensitivity tests using alternative measures of concentration and excluding outlier markets.

Validity is addressed at multiple levels. Fixed-effects staggered DiD designs and event-study diagnostics are employed to enhance internal validity. Premiums, network breadth, and plan design have been previously studied in the Marketplaces, thereby supporting construct validity. The external validity of the ACA Marketplace is high, given CMS's extensive coverage, but its generalizability to other insurance markets is limited.

My research uses only publicly accessible, aggregated administrative data, and no human subjects are involved. It is assumed, therefore, to be IRB-exempt in the default institutional criterion, which the university determines.

Chapter 4

Data and Variable Construction for ACA Marketplace Panel

In my thesis, I plan to use a county-year panel dataset covering 2014-2024 to assess the role of insurer marketplace concentration in ACA individual Marketplaces and to evaluate marketplace performance, specifically with respect to affordability and competition structure. My study structure is population-based, centered on geographic units visible in the CMS Marketplace Public Use Files (PUFs), and that can be reliably linked across years using geographic identifiers (county FIPS and/or rating area), issuer identifiers, and the CMS Plan ID Crosswalk. This is because it is intended to make the results applicable to the operating ACA Marketplace setting (rather than to a subset of respondents or a narrowly sampled dataset), while also allowing modern econometric identification strategies based on intra-market variation over time.

4.1 Data Sources (CMS Marketplace PUFs)

My panel is based on CMS Marketplace PUF, standardized across years and consolidated into a uniform county-year or rating-area-year format:

- Issuer Participation (PUF): Applied to build issuer counts, entry-exit competition shocks, and participation. The issuer participation files specify the presence of an issuer in a particular geography-year and are crucial for determining the evolution of concentration across entry, exit, and re-entry.

- Issuer-Level Enrollment (PUF): Issuer enrollments are aggregated at the geographic and annual levels. The data is used to calculate enrollment-weighted market shares, yielding an enrollment-weighted HHI that represents the concentration the average enrollee faces rather than the concentration the average county faces.
- Benchmark Premium (SLCSP) / Premium PUF: To build the primary affordability outcome. The price measure most relevant to Marketplace performance is the Second Lowest-Cost Silver Plan (SLCSP), which is used to benchmark the ACA tax credit.
- Plan Attributes (PUF): To create mechanism-based measures of performance except price (e.g., the availability of plans, deductibles, out-of-pocket maximums, and metal-level structure). They are handy for understanding how concentration is translated into consumer-friendly affordability and selection.
- Service Area (PUF): Ultimately verifies the proper definition of each issuer's operational footprint and is used to assess the market's presence at any location, particularly where plan offerings extend across multiple counties or rating areas.
- Plan ID Crosswalk (PUF): Facilitates longitudinal connections across years and standardizes plan identifiers over time, should any changes to plan identifiers or issuer-plan structures occur.

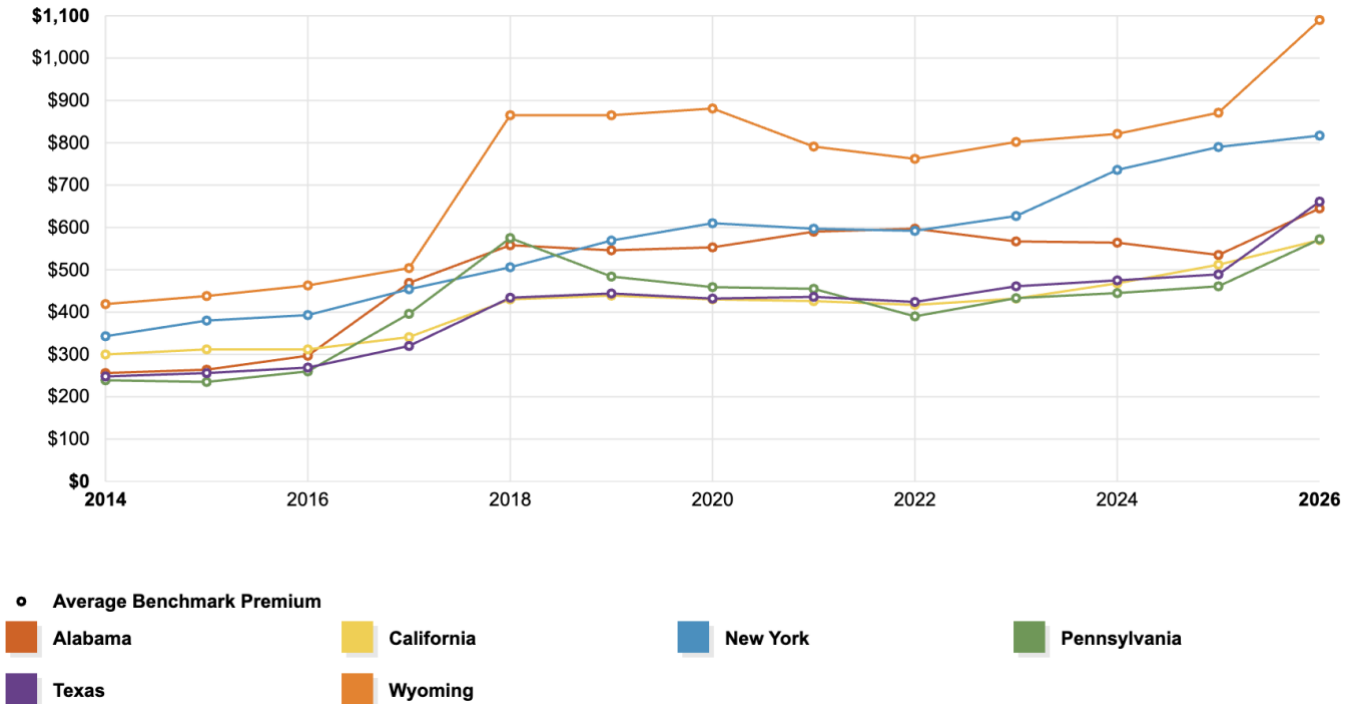


Figure 4-1 Benchmark premium trends across selected states, 2014-2026

Source: Kaiser Family Foundation (KFF) State Health Facts

4.2 Construction and Cleaning

My panel is created in Stata. The steps of my work process are as follows:

All datasets are standardized to a standard format (FIPS by county, year, issuer identifiers, plan identifiers). Type harmonization is essential, as CMS PUFs differ in field names, numeric types, and suppression conventions across years. My unit of choice is the county-year, since counties are the finest available geography that is consistently connected across the decade and can be mapped directly to determine issuer enrolments and participation. In cases where rating-area structures are required (e.g., in premium reporting), my analysis is based on rating-area-year panels and includes links to counties based on service-area rules. The identification

strategy is designed to allow both definitions to serve as robustness checks. Issuer-level enrollment is summed up to a county-year total, and then used to calculate issuer shares:

$$s_{jit} = \frac{Enrollment_{jit}}{\sum_j Enrollment_{jit}}$$

These shares form the basis of the enrollment-weighted HHI. The final set of inclusion criteria is that each county-year must (a) have defined geographic identifiers, (b) have linkable identifiers of issuers, and (c) not have missing enrollment totals in the HHI construction to be used in the primary analysis. Suppressed or structurally missing key fields are stored for descriptive analysis but are not exploited in the core econometric models because they do not permit valid outcome or treatment formation.

4.3 Independent Variable: Marketplace concentration (HHI)

My primary explanatory variable is ACA Marketplace insurer concentration, measured using the Herfindahl-Hirschman Index (HHI). For each geography i in year t:

$$HHI_{it} = \sum_{j=1}^{J_{it}} s_{jit}^2$$

where s_jit is the market share of issuer j in geography i in year t, and enrollment share is s_jit, yielding an HHI that can be interpreted directly as the concentration of Marketplace enrollees.

There are two versions of HHI I used:

Unweighted county mean HHI (geography-weighted): This measure indicates equity and geographic access issues, as population weighting does not dilute the influence of rural counties.

Enrollment-weighted HHI: This is the most important descriptive and analytical measure, as it aligns with consumer exposure and pricing.

For my thesis, concentration bins are reported according to both the legacy convention (commonly used in practice in applied health IO work) and the contemporary DOJ-FTC convention. The screening under the 2023 DOJ-FTC Merger Guidelines considers markets with a post-merger HHI ≥ 1,800 and an HHI ≥ 100 to be structurally concerned. Since Marketplace HHIs often exceed even the older, more focused benchmark, adopting the 2023 framing makes the policy timely and relevant to my thesis.

My thesis also aims to use multiple complementary measures to perform mechanism interpretation and robustness checks, to prevent excessive dependence on just one index:

- Issuers: J_it = number of issuers taking part
- Monopoly indicator: $Monopoly_{it} = 1[J_{it} = 1]$
- The dominant-issuer indicator: $Dominant_{it} = 1[max_j s_{jit} > 0.45]$ captures dominance even in non-monopolistic markets.
- Churn and shocks: entry/exit dummy and year-to-year changes in the number of issuers.

These confirm that HHI movement is associated with changes in participation, and that it can be employed in staggered DiD and event-study designs to capture discrete events.

4.4 Marketplace Performance

Marketplace performance, rather than overall health outcomes, is my primary outcome. Affordability outcome (benchmark premium): ln (SLCSP_it), log benchmark premium in geography i and year t. The log specification allows interpretation of the coefficients as

approximations of percentage changes and follows the conventions of health economics and applied IO pricing models.

4.5 Descriptive Results of the Cleaned Panel (2014-2024)

My thesis's contribution is that my cleaned panel records a history of structural transformation over ten years, showing a long-standing high level of concentration.

4.5.1 The Paradox of the Persistent High Concentration.

As indicated by my Stata outputs, the ACA Marketplace is, ten years after the development of the policy, still highly concentrated:

Enrollment-weighted HHI (2014): 6,178

Enrollment-weighted HHI (2024): 3,756

This is equivalent to a 39.21% decrease in concentration over ten years, indicating competitiveness, although the Marketplace remained substantially above the contemporary antitrust concern thresholds during that period. That is, the system drifted from its most extreme conditions but did not reach a competitive baseline.

To describe this factually:

Table 4-1 County-level ACA Marketplace concentration (HHI) and Monopoly prevalence, 2014-2024

Year	No. of counties	Mean HHI (unweighted)	Mean HHI (enrollment weighted)	Monopoly counties	Monopoly share (%)

2014	2247	7524.1	6178.2	487	21.67
2015	2247	6125.6	4884.7	182	8.10
2016	2247	5689.0	4348.1	182	8.10
2017	2247	7513.3	6185.2	901	40.10
2018	2247	8287.0	6712.8	1294	57.59
2019	2247	7925.4	6411.6	997	44.37
2020	2247	7478.7	5780.2	701	31.20
2021	2247	6321.3	4612.7	180	8.01
2022	2247	5918.9	4070.7	130	5.79
2023	2247	5602.6	3863.9	109	4.85
2024	2247	5100.9	3755.5	57	2.54

The years from 2017 to 2020 are considered special years due to policy and pandemic shocks and are thus handled separately using the event-study and difference-in-differences designs described.

Table 4.1 is an overview of 2014-2024 county-level ACA Marketplace concentration and monopoly prevalence using a balanced panel of 2,247 counties observed (constant N). This constant geographic component captures the time trends in true market development. Insurers' market shares were calculated using issuer-level Marketplace enrollment for each county-year (county total enrollment is the aggregate across participating issuers). The Herfindahl-Hirschman Index (HHI), defined as the sum of the squares of the issuer shares for a county-year, scaled by 0-10,000 (higher values indicate greater concentration; a value of 10,000 represents a one-issuer monopoly), was then computed. The unweighted mean HHI (weight of each county is equal) and the Enrollment-weighted mean HHI (counties weighted by the sum of enrolment, capturing the

concentration suffered by the average enrollee and not the average county) are reported in the table. County-years with a single participating issuer are called monopoly counties, and the percentage of monopolies in the balanced sample in each year is called the monopoly share (%).

The descriptive patterns are highly nonlinear. Between 2014 and 2016, the concentration decreases (the mean HHI, 7,524, is lowered to 5,689, and the monopoly share, 21.67%, is reduced to 8.10%), and it becomes significantly narrower between 2017 and 2019, with a sharp deterioration in 2018 (mean HHI 8,287). Subsequently, the degree of concentration gradually increases, and the market is in its most competitive position in 2024 (mean HHI: 5,101; monopoly share: 2.54%). It is important to note that the enrollment-weighted HHI is systematically smaller than the unweighted HHI, and the larger the county enrollment, the less concentrated it is.

These findings should be internally and methodologically valid, as they match monopoly shares with monopoly counts using a constant denominator. The remaining ambiguity concerns how the levels will be identified for counties not included in the sample, though the balanced method is desirable for comparability.

4.5.2 Urban and rural stats

In 2024, my Stata results show:

Unweighted mean HHI: 5,100.9

Enrollment-weighted average HHI: 3,755.5

The considerable disparity implies that gains from competition are concentrated in high-enrollment, high-population-county counties, with a long tail of counties that are likely to be

either rural or low-enrollment and left in a state of monopoly. This is first-hand evidence of Marketplace's stratification.

4.5.3 Monopoly counties for shock variation

There is a radical shift in the structure of monopoly counts:

Monopoly counties (2014): 487

Monopoly counties (2024): 57

It is an 88.29% decline in the number of monopoly counties in ten years. This is not descriptive in any sense: it is the key indication of staggered variation that I require in my entry/exit event-study and staggered DiD designs. Because some counties do not transition to non-monopoly treatment in the same year, the panel implies a staggered treatment timing, which provides an incentive to adopt modern DiD estimators and event-study designs to estimate heterogeneous treatment effects.

4.6 Summary

My data structure is discernible, and the key variables used throughout my thesis are defined. The 2014-2024 county-year Marketplace panel tabulates a decade of structural transformation with a massive decrease in concentration, but would be classified as highly concentrated in any modern antitrust screening test, a strong urban-rural drift in competitive gains as revealed by the difference between the unweighted and enrollment-weighted concentration and a drastic reduction in the number of monopoly counties that is adequate to provide the staggered variation required in event-study and staggered DiD.

Chapter 5

Econometric Strategy

5.1 Model Framework

The primary empirical specification is a county-level panel model with county and year fixed effects:

$$Y_{ct} = \beta \cdot HHI_{ct} + \gamma X_{ct} + \mu_c + \lambda_t + \epsilon_{ct}$$

Where:

Y_ct: Outcome variable in county c and year t (e.g., benchmark ACA premiums)

HHI_ct: Insurer concentration index in county c and year t (from CMS Public Use Files).

X_ct: Control variables with time-varying county characteristics; median age, per capita personal income (log), and total population (log).

μ_c: County fixed effects.

λ_c: Year fixed effects.

ϵ_ct: Potential errors

Standard errors would be clustered at the county level to account for serial correlation and spatial dependence within counties over time (Bertrand, Duflo, & Mullainathan, 2004).

Estimating the effect of market concentration (HHI) on health outcomes using simple Ordinary Least Squares (OLS) is likely biased.

5.2 My Hypotheses

Hypothesis 1 (Premiums): The higher the HHI, the more the benchmark premiums (second-lowest cost silver plan) increase. This is consistent with the prognosis that reduced competition will allow major insurers in the market to raise prices.

Hypothesis 2 (Choice): An increase in HHI reduces the number of options available to insurers and plans per rating area. Greater concentration confers market power, diminishes consumer choice, and discourages innovation.

Hypothesis 3 (Threshold Effect): When health and economic outcomes deteriorate, one insurer takes over 50 percent of enrollees. Nonlinear monopoly dynamics suggest that negative impacts will increase more rapidly as market control exceeds approximately 45%.

5.3 Data Acquisition

My thesis uses a county-year panel inferred from multiple sources:

- CMS Public Use Files (PUF): Provide insurer participation, enrollment shares, HHI, and premiums (2014-2024).
- BEA: Per capita income
- U.S. Census: Population and median age
- CDC WONDER: Mortality data.
- BRFSS: Prevalence of chronic disease, Measures of access.
- SAHIE: Uninsured rates.
- KFF: Status on Medicaid expansion.

5.4 Two-Way Fixed Effects (TWFE)

	Log benchmark premium at age 27	
Market concentration (HHI)	0.0089***	(0.0007)
Median age	-0.0230***	(0.0020)
Log per capita income	-0.0675***	(0.0224)
Log population	-0.3478***	(0.0424)
Observations	27560	
Within R^2	0.033	
County FE	Yes	
Year FE	Yes	

Standard errors in parentheses.
Standard errors clustered at the county level.
HHI scaled in thousands (1 unit = 1000 HHI points).

Figure 5-1 Model 1 (2014-2024): HHI + Demographics

My Model 1 estimates a county-by-year two-way fixed effects (TWFE) regression of log benchmark premium for age 27 on market concentration and county covariates, 2014 2024. The dependent variable is calculated by taking the natural logarithm of the county-year mean benchmark premium for age 27. The regressor is HHI (this time scaled 0-1000) (the Herfindahl-Hirschman Index), which equals the sum of the squared insurer enrollment shares in a county-year market. An increase in HHI would indicate fewer effective competitors and greater insurer market power. Controls such as the county median age, log per capita personal income from the BEA, and log county population are included. The county fixed effects capture time-invariant county variables (baseline cost levels, geography, and maintenance of provider structure), and the year fixed effects capture national policy shocks. The standard errors are clustered at the county level.

The HHI coefficient is 0.0089 (SE 0.0007, p <0.001). Since the result is expressed in log terms (e.g., toward a more concentrated market), a 100-point increase in HHI would be associated with a 0.89 percentage-point higher premium. The finding supports Hypothesis 1 within counties.

All controls are statistically significant: the median age is negative (-0.0230), implying that, conditional on FE, aging in counties over time is associated with lower benchmark premiums (this may occur when premium dynamics are dominated by insurer pricing policies, subsidies, or risk-pool composition). Income and population are also negative, which is, yet again, in line with larger/richer markets having more plan offerings, better risk pooling, and greater competitive pressure. The sample is robust (N=27,560; 2,667 counties), which gives consistent inference. One important ambiguity concerns causality: TWFE will reduce bias due to persistent county characteristics but cannot fully address time-varying confounding or reverse causality (insurer exit may increase HHI in response to higher premiums).

	Log benchmark premium at age 27	
Market concentration (HHI)	0.0036***	(0.0013)
UnitedHealthcare present	-0.0280***	(0.0100)
Median age	-0.0240***	(0.0073)
Log per capita income	-0.0973**	(0.0383)
Log population	-0.4606**	(0.1812)
Observations	7534	
Within R^2	0.012	
County FE	Yes	
Year FE	Yes	

Standard errors in parentheses.
Standard errors clustered at the county level.
HHI scaled in thousands (1 unit = 1000 HHI points).

Figure 5-2 Model 2 (2014-2016): HHI + UHC presence + Demographics

My Model 2 constrained the panel to 2014-2016 by adding UnitedHealthcare present, a county-year variable equal to 1 when UnitedHealthcare is in the marketplace for that county-year and 0 otherwise. The dependent variable is again Log benchmark premium age 27, and the specification includes both county and year fixed effects, with country-clustered standard errors. The model tests the influence of a large national insurer on prices, beyond what is explained by overall concentration (HHI).

The HHI coefficient is reduced to 0.0036 (SE 0.0013, p=0.004). In real terms, a 100-point increase in HHI would lead to a 0.36 percentage-point premium increase in the 2014-2016 period, which is lower than in the full-period model. Such a decline in size is reasonable since (i) the presence of fewer structural shifts in the short window, (ii) introducing UHC presence might grab a significant competitive advantage that partially overlaps with HHI proxying.

More notably, UnitedHealthcare present = -0.0280 (SE = 0.0100, p = 0.005). The presence of UHC is associated with a reduction in the benchmark premium of approximately 2.8 percent, holding HHI and covariates constant. This is consistent with the fact that the entry/presence of a large carrier may increase price competition, even when concentration is high. This directly supports my claims in Hypothesis 1, suggesting a plausible competitive mechanism: in concentrated markets, high premiums exist, whereas entry by a major competitor can drive prices down.

One might observe the greater magnitude in Log Population because the number of years is small, and other unobservable changes (migration, employer composition, exchange dynamics) may be correlated with the within-county change in population. Endogeneity is a major concern: UHC can select counties that appear profitable or risky, so the -2.8% relationship

is not necessarily causal. Nevertheless, the estimates in this window hope to be statistically accurate (N=7,534; 2,534 counties) and economically sound.

5.5 Event-Study Difference-in-Differences

The model picked is:

$$Y_{ct} = \alpha_c + \lambda_t + \sum_k \beta_k D_{c,t+k} + \varepsilon_{ct}$$

where $D_{c,t+k}$indicates years with respect to the entry event.

	Log benchmark premium at age 27	
UnitedHealthcare entry year (t)	-0.0011	(0.0085)
One year after UnitedHealthcare entry (t+1)	-0.0463***	(0.0115)
Observations	7696	
Within R^2	0.004	
County FE	Yes	
Year FE	Yes	

Standard errors in parentheses.
Standard errors clustered at the county level.

Figure 5-3 Event Study DiD (2-period DiD): UnitedHealthcare (UHC) Entry, 2014-2016

The event-time DiD specification in this table reports the dependent variable, the natural logarithm of the mean ACA benchmark premium for a 27-year-old, with fixed and county-clustered standard errors. The event is UnitedHealthcare (UHC) entering a county market. The two important regressors are the year of entry and the first post-entry year (one-year post-period). The distinguishing variation arises from comparing within-county premium changes at

different entry timings against similar changes in counties that have not undergone entry, time-invariant county-specific characteristics, and macro shocks observed nationwide (policy cycles and macro trends).

The coefficient on entry year (2015) is -0.0011 (SE = 0.00849, p = 0.896), which is practically zero and not statistically significant. This would actually mean that there is no detectable entry-year increment in benchmark premiums. One year post entry = -0.0463 (SE = 0.01145, p = 0.001), indicating that premiums are reduced by approximately 4.6 percent after UHC entry. The 95% interval for entry year (approximately -0.069 to -0.024) indicates that the decrease in post-entry on entry is economically significant and accurately measured. This lagged effect is consistent with the institutional properties of ACA pricing: providers submit premiums early, and competitive reactions do not always manifest in the current plan year but in the following plan year. This substantiates the competition mechanism under Hypothesis 1, which posits that markets become more competitive when a large-scale insurer enters, and that, in turn, benchmark premiums decline.

It is more powerful than cross-sectional OLS because it can use time and fixed effects, but because it covers only 2014-2016, the model's ability to establish parallel trends is limited. Since the table lacks an explicit lead, it cannot conclusively show that the treated counties were already heading in a different direction before entry, so it is quasi-causal but not definitive. Entry may not be random — UHC might choose counties based on projected profitability or regulation — so even with fixed effects, there remains an opportunity for endogeneity.

Chapter 6

Discussion and Policy Implications

6.1 The Cost of a Monopoly

My thesis presents evidence of a strong, statistically significant relationship between insurer market concentration (measured by the Herfindahl-Hirschman Index) and benchmark premiums in the Affordable Care Act (ACA) marketplaces between 2014 and 2024, across county-year panel. Although the estimated two-way fixed effects (TWFE) coefficient for HHI appears relatively small, its magnitude provides compelling evidence that hundreds of millions of Americans will experience a significant burden from declining competition among insurers as the marketplace continues to consolidate, with fewer large firms participating. For example, using the commonly accepted 0 to 10,000 scale, a 1,000-point increase in HHI corresponds to a 0.888% increase in benchmark premiums, all else being constant, including county and year fixed effects and other measured variables. Such increases in benchmark premiums are significant given the rapid growth of enrollee-weighted HHI from approximately 4,347 in 2016 to 6,713 in 2018 (an increase during a time of significant insurer exits and considerable uncertainty regarding the future evolution of all of the ACA policies, including the tax credits available to assist lower-income individuals in purchasing health insurance). Based on the estimated coefficient, individuals living in counties with lower competition are expected to pay approximately 2.1% more in benchmark premiums than those in counties with higher competition.

Using the 2018 benchmark premium of $477, for example, corresponds to an expected increase in coverage costs proportional to the county HHI increase ($10/month or $120/year for an individual enrollee). For enrollee households with more than one individual, the enrollee premium increase will exceed this amount because it scales with the number of individuals enrolled in the household and varies by county HHI. Therefore, households will be expected to pay hundreds of dollars more annually for health care, with no corresponding improvement in the level of benefits provided by their health insurance coverage or access to healthcare. My findings are consistent with empirical research as well. Dafny, Duggan, & Ramanarayanan (2012) document increases in premiums resulting from insurer consolidation in the commercial marketplace; however, entry by additional insurers (Dafny, Gruber, & Ody, 2015) reduces marketplace premiums.

The results from the difference-in-differences (DiD) event study also support a causal interpretation, providing compelling evidence that UnitedHealthcare's entry into the market directly affects benchmark premiums. UnitedHealthcare's entry into the market was associated with a 4.6% decrease in benchmark premium levels in the year following entry, directly supporting the relationship between increased competition and lower prices. Based on a $477 benchmark premium, this translates to an estimated $22 monthly reduction ($261 annually), which is economically meaningful for households near the subsidy eligibility threshold. This estimated reduction in premiums is similar to those reported by Jacobs, Banthin, & Trachtman (2015), who reported a 5.4% decrease in premiums associated with the addition of a second health plan in federally facilitated marketplaces.

The results corroborate a Structure–Conduct–Performance (SCP) interpretation of market power (Bain, 1956; Tirole, 1988). In highly concentrated markets, insurers have less competitive

pressure and may price above marginal cost, especially when consumer demand is relatively inelastic. Although my thesis does not directly estimate causal effects on mortality, the results provide evidence of potential downstream implications for health outcomes. Not every theoretical point of view foretells that insurer concentration is always welfare-threatening. Recent studies by Kong, Layton, and Shepard (2024) claim that the adverse selection dynamics of health insurance markets can make them exhibit characteristics of a natural monopoly. Within their model, higher concentration can enhance welfare by enabling insurance companies to more effectively pool risks, stabilize premiums, and deter spirals of adverse selection.

6.2 Antitrust policy implications

The computed results have direct implications for the imposition of antitrust in health insurance markets. According to the DOJ-FTC Merger Guidelines of 2023, a highly concentrated market with an HHI above the specified thresholds is subject to investigation. Nevertheless, modern antitrust law remains closely focused on price impacts, particularly on premium increases. My thesis also contends that the approach is incomplete.

Merger assessments should factor in non-price aspects of competitors, including geographic coverage (particularly in rural areas), provider network breadth, and measures of access and utilization. The rise in concentration recorded during 2017-2018 was not the result of a single merger but rather of successive insurer exits. This shows that cumulative market dynamics warrant consideration.

6.3 Medicaid Expansion Heterogeneity

As mentioned in my literature review, the researchers emphasize that insurer concentration across markets is not uniform. ACA's expansion of Medicaid pulls a sizeable portion of the low-income, high-risk group out of the Marketplace and into Medicaid, thereby enhancing the risk pool for private insurers. This pattern is supported by data from Frean, Gruber, and Sommers (2017) and other sources (Kaiser Family Foundation, 2020) examining premium variations in expansion and non-expansion states. The adverse selection issue is reduced in these environments, thus minimizing the chances of insurer withdrawal and curbing growth in concentration. Nevertheless, non-expansion states have higher uninsured rates and greater insurer instability. Thus, market fragility exacerbates the effects of lower competition.

6.4 Limitations

The interpretation of my findings is limited in several ways. To begin with, aggregating county-year data introduces error, especially in the underlying premiums, which are determined at the rating-area level. This can introduce some inaccuracy in translating market structure into price outcomes. Despite the use of fixed effects and staggered DiD methods, residual endogeneity cannot be ruled out entirely. Time-varying factors that cannot be observed, e.g., domestic economic shocks or changes in provider supply, may affect insurer participation and premiums. As my thesis does not fully account for recent policy changes affecting the Affordable Care Act (ACA) marketplaces in 2026. ACA benchmark premiums increased by an average of 21.7% in 2026 — far above the 2.0% average annual growth observed between 2020

and 2025 — driven largely by the expiration of enhanced premium tax credits and anticipated enrollment contraction (Holahan & O'Brien, 2026).

Findings are suggestive of the ACA individual Marketplace but may not apply to other insurance categories, including employer-sponsored insurance or Medicare Advantage, which are regulated under distinct regulatory and competitive environments.

Although my study traces mechanisms by which concentration is associated with affordability, it does not directly estimate the causal impact on long-term health outcomes (ex, prevalence of chronic diseases), an essential direction for future studies.

6.5 Summary

My intention was to reveal that insurers' market concentration has economically significant, systematically different impacts on the performance of ACA Marketplaces. Greater concentration has been linked to higher benchmark premiums, and these effects are stronger in markets with weaker safety nets, greater provider concentration, and lower income levels.

My thesis represents a step beyond a decade of descriptive association to offer causal evidence that more competition lowers premiums in ACA Marketplaces. The coherence between the TWFE estimates and the event-study DiD results reinforces the view that insurer market structure directly affects pricing outcomes.

My results could also suggest that health insurance markets cannot be understood solely in terms of price competition. Market structure determines the availability, affordability, and allocation of healthcare resources across the population. The findings confirm that antitrust

policy should be reoriented to include geographic accessibility, market stability, and distributional effects, in addition to conventional price-driven measures.

In this regard, competition among insurers is not merely an economic issue; it is a primary determinant of equity and efficiency in healthcare delivery systems.

Conclusion

7.1 Major Takeaways

My thesis seeks to answer a simple question: Does reduced competition permit insurers to exercise market power within the ACA Marketplace, and, if so, at what cost to American consumers?

Based on a sample of 27,560 observations, representing all these counties over the entire ACA Marketplace operation period, 2014 to 2024, using CMS Marketplace Public Use Files linked to BEA and Census Bureau demographics, my thesis implemented two identification strategies. In tests using a Two-Way Fixed Effects model that accounts for all time-invariant county-specifics and all country-year-specific shocks, a 1,000-point rise in HHI is associated with a 0.888 percentage-point increase in the premium, significant at the 0.1 percent level. A less-biased causal estimate was obtained by the staggered Difference-in-Differences event study, which hinged on the entrance of UnitedHealthcare in particular county markets between 2014 and 2016: the decrease in premiums after the entry of the latter was about 4.6 percent per year in the first year after the entry, which was significantly smaller than the independent estimate of Jacobs et al. (2015).

The ACA Marketplace markets have lived up to their structural oligopoly 10 years after partial deconcentration. The sharp rise in the number of monopolies from 182 in 2016 to 1,294 in 2018, due to insurers leaving and the removal of the cost-sharing reduction payments, proved the instability of competitive gains of that sort without regulations.

Compounding disadvantages, including increased provider system concentration, reduced plans, and more sensitive premiums, are observed in the markets of non-Medicaid expansion states; simultaneously, the worsening affordability of rural markets and provider-insurer interactions (Anderson, Abraham, and Drake, 2019). This geographic stratification is measured directly by the gap between the unweighted and enrollment-weighted HHIs of 5,101 and 3,756 in 2024, with the competitive gains accruing disproportionately to large cities, even as rural counties with sparse enrollee populations were deliberately left out.

The implications of these findings for antitrust enforcement are direct. The new DOJ-FTC Merger Guidelines in 2023 are a significant enhancement of the regulatory regime, reflecting increased criticism of cumulative consolidation trends. Yet, according to my thesis, insurance market concentration in the ACA environment does not only occur through mergers, but through exits by insurers - something that a traditional transaction-by-transaction review of mergers would theorize is structurally unfit to analyze. In my opinion, geographic coverage requirements, network adequacy, and rural markets in merger appraisals would be more reflective of the full social cost.

7.2 Future Research Suggestions

After reading extensively and acknowledging my thesis's limitations, I would want to recommend research directions for future work. The theoretically downstream health outcome pathway proposed by Abaluck et al. (2021), connecting characteristics and network access to mortality, should be studied directly at the market-concentration level.

In particular, the gap between the premium impact observed here and the health outcome consequences underlying the policy argument would be bridged by analyzing which of the Ambulatory Care Sensitive Conditions, including uncontrolled diabetes, hypertension, and asthma-related hospitalizations, is most responsive to change in counties that have experienced HHI. This extension is based on the already identified data source used as the foundation of my thesis: county-level hospitalization data from HCUP. Secondly, network breadth information, as opposed to aggregate market-wide measures of concentration, would enable the researcher to distinguish two types of mechanisms of consumer harm that this thesis cannot currently disentangle: direct premium-setting power and indirect access restrictions via network narrowing. Dafny, Hendel, Marone, and Ody (2017) find that narrow networks are widespread in more heavily concentrated markets. Nevertheless, the causal chain from HHI to network breadth to health utilization is not fully established at the county level.

The Medicare Advantage market is a logical continuation of the analytical framework of my thesis. In the same period (2014-2024), Medicare Advantage has undergone tremendous consolidation. A few national insurers, such as UnitedHealthcare, Humana, CVS-Aetna, and Elevance Health (formerly Anthem), have acquired an ever-growing portion of enrolment. Offering the TWFE and staggered DiD designs developed in my thesis to Medicare Advantage county-level data would test whether the concentration-premium relationship holds outside the ACA individual market and whether the same policy tools enhance entry incentives, geographic coverage requirements, and antitrust scrutiny.

Appendix A: TWFE Regressions with Number of Insurers as Outcome

Table 1: Market Structure Regressions: Number of Insurers

	(1) Model 1		(2) Model 2	
	b	se	b	se
HHI (0–10,000)	-0.0003***	(0.0000)	-0.0002***	(0.0000)
County median age	0.0567***	(0.0106)	-0.0535	(0.0361)
Log per-capita income	-0.1256	(0.1096)	1.1641***	(0.1980)
Log total population	2.8847***	(0.3169)	-3.7025***	(1.0067)
UnitedHealthcare present			0.4516***	(0.0618)
Observations	27560		7534	

Standard errors in parentheses.

Standard errors clustered at the county level.

County and year fixed effects included.

Appendix B: Variables Used in Data Building

variable	definition
year	Coverage year
countyfips	County FIPS code
prem27_mean	Mean benchmark premium at age 27
prem50_mean	Mean benchmark premium at age 50
hhi_0to10000	Herfindahl–Hirschman Index (0–10,000)
n_issuers	Number of insurers in county–year market
monopoly	Indicator for monopoly market
max_share	Largest insurer market share
median_age_tot	Median age of county population
ln_pop	Log total population
ln_pcpi	Log per capita personal income
ln_prem27	Log benchmark premium at age 27
uhc_present	Indicator for UnitedHealthcare presence

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