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ABSTRACT

This paper exploits the nationwide merger of CVS and Universal American to examine how industry consolidation in Medicare Part D affects beneficiaries' enrollment in stand-alone prescription drug plans (PDPs) and out-of-pocket (OOP) drug spending. Data come from the 2010-2016 waves of the Health and Retirement Study (HRS). We find that overall, the merger decreases enrollment in stand-alone PDPs and increases OOP drug spending among enrollees who remain in PDPs. The merger's negative effects on PDP enrollment are driven by healthier beneficiaries, while the increases in OOP drug spending are stronger for lower-income individuals and for individuals in worse health. The merger also leads to effects beyond drug usage and the PDP market; in particular, PDP enrollees use fewer outpatient visits and, overall, Medicare beneficiaries are less likely to enroll in Medicare Advantage prescription drug (MAPD) plans after the merger. Finally, we find some evidence that higher plan premiums and changes in plans' quality and drug access after the merger are potential mechanisms leading to our main results.

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1. Introduction

Health care spending has been rising faster over time in the US compared to in other similar countries, reaching $4.5 trillion in 2022, the highest level among all OECD countries (Anderson et al. 2018; Hartman et al., 2023). Against this backdrop of high and rising spending, with little obvious benefit for population health at the margin, there is growing concern about the distribution of market power and prices in the US health care sector.[1] Many US health care markets have become increasingly consolidated in recent years (Damberg, 2023), raising questions about the effects of consolidation on prices, health care quality, and access to care. The health insurance market is no exception, where more than 57 percent of metropolitan areas were highly concentrated as of 2016 (Fulton 2017). Understanding the effects of consolidation in the health insurance market is especially critical given the vast size of this market; 92 percent of the U.S. population is covered by health insurance, either by private insurance or by public insurance which is often provided by private firms (RAND 2022; Dafny et al. 2015; Keisler-Starkey et al. 2023; Dafny 2021).

In this paper, we focus on the Medicare Part D stand-alone prescription drug plan (PDP) insurer market, and test whether consolidation in this market affects PDP enrollment and beneficiaries' out-of-pocket (OOP) drug expenditures. To date, the existing literature mostly focuses on the effects of consolidation in insurance markets on health insurance premiums. In theory, consolidation in health insurance markets can have opposing effects on premiums. On the one hand, consolidation may result in lower premiums because consolidation leads to scale economies and to insurers having stronger negotiating power against health care providers, which potentially lowers premiums (see, for example, Melnick et al. 2011 and Scheffler and Arnold 2017 for evidence on commercial insurance). On the other hand, consolidation in insurer markets can lead

[1] The US does not necessarily provide better quality health care than other OECD countries (Telesford et al., 2023).

to higher premiums because of market power (see Dafny et al. 2012 and Trish and Herring 2015 for evidence on commercial insurance; Dafny et al. 2015 for evidence on ACA Marketplace plans).

Prior empirical research shows mixed effects of insurer market consolidation on premiums (see evidence in Scheffler et al. 2016 for ACA Marketplace plans; Ho and Lee 2017 for commercial insurance; Chorniy et al. 2020 and Hill and Wagner 2021 for Medicare Part D). Studying the effects on premiums is important since health insurance premiums in the US are high and rising. The average yearly premium for family coverage was $23,968 in 2023 and has risen 47 percent since 2013 (Kaiser Family Foundation, 2023). We know much less, however, about the effects of insurer market consolidation on outcomes measured at the individual level – such as insurance enrollment decisions and individual drug expenditures - which are closely related to consumers' wellbeing.

Our study, focused on the Medicare Part D stand-alone PDP market, is of particular interest for two reasons. First, Part D is crucial in providing access to outpatient prescription drugs to the elderly. As of 2024, 53 million of the 67 million people covered by Medicare were enrolled in Part D plans, with 43% of them enrolled in stand-alone PDPs (Medicare Advantage also offers Part D drug plans, called MAPDs) (Kaiser Family Foundation, 2024). Second, since the rollout of Medicare Part D in 2006, the stand-alone PDP market has become more concentrated over time (Kaiser Family Foundation, 2024). The number of insurers offering stand-alone PDPs decreased from 65 in 2009 to 51 in 2016 (Figure 1). Thus, it is of policy interest to understand how industry consolidation in the Part D stand-alone PDP market may affect program enrollment and OOP drug expenditures. If industry consolidation increases the market power of insurers, it may lead to higher premiums and lower plan quality. As a result, consolidation may result in lower PDP enrollment and higher OOP drug expenditures, which potentially harms consumers.

Our empirical analysis exploits the merger between CVS and Universal American in 2011 as a quasi-experiment of industry consolidation. The identification assumption is that this nationwide merger impacting all CMS markets is independent of individuals' Medicare Part D enrollment decisions and OOP drug expenditures. Since the timing of the CVS-Universal American merger is common across all CMS markets, we exploit the enrollment-based market share of these two insurers as of 2010 to allow merger effects to depend on their pre-merger combined market share.

We merge these heterogeneous merger treatments to individual-level data in even years from the 2010-2016 waves of the restricted version of the Health and Retirement Study (HRS) based on each HRS respondent's state and interview year. Then, we estimate the merger's effects on HRS respondents' stand-alone PDP enrollment and OOP drug expenditures, including individual characteristics, Centers for Medicare and Medicaid Services (CMS) market fixed effects (FEs), year FEs and market-specific time trends in our baseline models. Our main findings indicate that, for our sample individuals residing in CMS markets where the merging insurers have a higher combined market share, the merger is associated with decreases in stand-alone PDP enrollment and increases in OOP drug expenditures after the merger. Our results remain robust when using alternative measures of the merger treatment variable.

Next, we explore heterogeneous effects. We find that sicker individuals are less likely than their healthier counterparts to switch away from stand-alone PDPs after the merger, while both sicker and lower-income individuals have higher OOP drug expenditures after the merger. These groups typically have a greater need for medications and may be worse off after the merger. Further, we find that the merger affects outcomes beyond drug usage and the PDP market. Specifically, individuals residing in markets where the merging insurers have a higher combined market share have fewer outpatient visits and decreased MAPD enrollment after the merger.

Finally, we explore the potential channels through which the merger affects stand-alone PDP enrollment and OOP drug expenditures. For this analysis, we employ a plan-year-level dataset of standalone PDPs from the CMS Landscape files and Prescription Drug Plan Formulary, Pharmacy Network, and Pricing Information files, which cover the even years from 2010 to 2016 across all CMS markets. We find that the merger increases plan premiums, and decreases some aspects of plan quality/access, which is consistent with the hypothesis that our main results can be attributed to insurers exercising market power after the merger.

This paper contributes to the literature on the effects of Medicare Part D on older adults' outcomes related to prescription drug coverage. Duggan and Morton (2010) find that prescription drug use increased significantly among Medicare Part D enrollees, likely due to lower prices. Ketcham and Simon (2008) report that OOP costs were reduced significantly among seniors within the first year of the program. Engelhardt and Gruber (2011) show that most of the reductions in OOP costs accrued to a small proportion of the elderly who had the highest risk of spending. Overall, in a recent survey of 65 studies, Park and Martin (2017) report that Medicare Part D decreased OOP costs and increased drug utilization. Our work adds to this literature by providing new evidence on how industry consolidation in the Medicare Part D PDP market decreases beneficiaries' program enrollment and increases OOP drug expenditures. Importantly, our results suggest that the benefits of Medicare Part D are partially offset by industry consolidation.

Our paper also contributes to the empirical literature on understanding the effects of industry (horizontal) consolidation in health insurance. Dafny et al. (2012) use a proprietary dataset on employer-sponsored health plans between 1998 and 2006 to examine the 1998 merger between Aetna and Prudential. They find that premiums increase by 7 percent, and the insurer reduces payments to physicians by 3 percent. Chorniy et al. (2020) examine 10 mergers in the Medicare

Part D market between 2006 and 2012. They find premiums increase when the merging insurers operate in the same Medicare region. However, the merging insurers can bargain for better drug access with the drug manufacturers for their plans. Plan consolidation leads to productive efficiency. In a closer relationship to our paper, Hill and Wagner (2021) find that the merger between CVS and Universal American raises premiums only in markets with a higher concentration of market share. Our paper contributes to the literature by extending these analyses beyond market-level outcomes to individual-level outcomes. We report new evidence that industry consolidation affects program enrollment, OOP drug expenditures and health care utilization among Medicare beneficiaries. This connection elucidates the impact of industry consolidation on the health of Medicare beneficiaries in the insurer's market.

The rest of this paper is organized as follows. Section 2 discusses industry background. Sections 3 and 4 present the data and empirical methodology, respectively. Section 5 discusses the results. Section 6 concludes.

2. Industry Background

Medicare Part D is voluntary prescription drug coverage available to all Medicare beneficiaries. The program was enacted under the Medicare Modernization Act (MMA) of 2003 and went into effect on January 1, 2006, following a limited, transitional drug discount program that was offered in 2004-2005. Medicare beneficiaries can choose either stand-alone PDPs if they enroll in the Medicare Part A and B programs or a MAPD plan which is a Medicare Part C plan plus prescription drug coverage. Following existing studies, we treat stand-alone PDPs and MAPDs as two separate product markets and mainly focus on the stand-alone PDP market.

M&A activities have been a driving force shaping the competitive landscape of the Medicare Part D standalone PDP market. At the time of Medicare Part D's inception, 65 different organizations offered more than 1,400 plan options, with a typical state offering 40-45 plans provided by 15-20 organizations (Hoadley, 2006). Figure 2 depicts the nationwide market shares of the top 20 insurers providing PDP plans. In 2009, United Health and Humana covered 24.9% and 11.3% of total enrollment, with the remaining divided among dozens of others. By 2016, the market had become more concentrated. CVS Health covered 22.6% of the total enrollment, followed by United Health (20.8 percent) and Humana (19.6 percent). The top three insurers had more than half of the total enrollment.

The rise of CVS together with industry consolidation in Medicare Part D is related to a series of mergers. In 2010, CVS ranked 5th with 6.7% market share. Universal American acquired Member Health in 2008 and reached a market share of 10.8% in 2010. After that, CVS acquired Universal American in 2011 and Health Net in 2012, which brought up the market share of CVS to over 10%.[2] Since 2012, the market share of CVS stayed about 21%-22% until 2016.[3]

3. Data

We utilize three datasets for our empirical analysis. First, we use even-year individual-level data from the 2010-2016 waves of the Health and Retirement Study (HRS), which is a longitudinal survey of Americans over 50 years old and their spouses. Since HRS respondents are primarily interviewed in even years (90.2%), using odd-year samples could introduce small-sample biases.

[2] Market share increased less than 2% for CVS following the 2012 CVS-Health Net merger. This increase is substantially smaller than the over 10% market share gain resulting from the 2011 CVS-Universal merger. As a result, we do not differentiate the impact of the 2012 merger from that of the 2011 merger.

[3] Beyond our sample period, the DOJ reviewed the merger between CVS Health and Aetna and approved it conditional on the divestiture of Aetna's Part D businesses to WellCare (US Department of Justice, 2018).

Therefore, we select only an even-year sample. About 20,000 people take part in this survey in each wave (every 2 years). We employ this dataset to examine program enrollment, OOP drug expenditures and health care utilization at the individual level. Second, we use detailed plan-level data from the CMS Landscape Files, CMS Monthly Enrollment by Contract/Plan/State/County files, and the Prescription Drug Plan Formulary, Pharmacy Network, and Pricing Information Files. It includes on average 1,807 stand-alone PDPs per year. These data span 4 even years from 2010 to 2016 and cover 50 states and 34 CMS regions. We employ this dataset to compute the market share of these two merging insurers in 2010 and to explore the potential mechanisms underlying our main results.

3.1 Individual-Level Data

Individual-level data come from the restricted-use version of the HRS, 2010-2016 waves. We create the analytic sample using the following criteria: 1) we only keep HRS respondents who are over 65 years old and report enrollment in Medicare because this group is eligible for Medicare Part D; 2) we drop 1,614 HRS respondents who report being disabled (when asked about current work status) because previous studies show that Medicare Part D does not affect disabled individuals' drug utilization (Nelson et al., 2014); 3) we exclude 1,000 respondents who changed their state of residence during our sample period; 4) we exclude 1,994 respondents who are dually eligible for Medicare and Medicaid; 5) we limit the sample to respondents residing in the mainland U.S.; and 6) we limit the sample to HRS respondents who have non-missing responses to survey questions related to this study.

Outcome Variables: We focus on the following questions in the HRS related to Medicare Part D program enrollment, OOP drug expenditures, and health care utilization:

1. "Are you enrolled in Medicare Part D, also known as the Medicare Prescription Drug Plan?" We use the answer to this question to construct two binary indicators of program enrollment: (a) enrolled in a PDP; and (2) enrolled in an MAPD. (See Appendix Figure A1 for details about variable construction.)
2. "On average, about how much have you paid out-of-pocket per month for these prescriptions?" We use the answer to this question to construct a continuous variable measuring OOP drug expenditure.
3. "Sometimes people delay taking medication or filling prescriptions because of the cost. At any time have you ended up taking less medication than was prescribed for you because of the cost?" We use the yes/no response to this question to construct a binary indicator of cost-related medication nonadherence (CRN).
4. "Aside from any hospital stays or outpatient surgery, how many times have you seen or talked to a medical doctor about your health, including emergency room, clinic visits, or house calls in the last two years?" We use the answer to this question to construct a continuous variable measuring outpatient visits.

Panel A of Table 1 reports the descriptive statistics of our outcome variables. In our sample, 32% of observations are enrolled in Medicare Part D stand-alone PDPs, while 28% report enrollment in MAPDs. National data indicates that the average participation rates in PDPs and MAPDs among Medicare beneficiaries aged 65 and older were 36.4% and 20.6% in 2010, and 52.0% and 34.5% in 2016 respectively.[4] Our sample excludes disabled and dually eligible

[4] Calculated by authors. Data source: https://www.kff.org/other/state-indicator/medicare-beneficiaries-enrolled-in-part-d-coverage/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D

individuals, which probably explains the lower rates of PDP enrollment in our sample vs. in the national population of the elderly.

To mitigate concern about outliers for continuous outcome variables, we winsorize OOP and outpatient visits at the 95th percentile. The average monthly OOP drug expenditure is $45.74, with PDP enrollees averaging at $51.71 and MAPD enrollees averaging at $42.83. Further, about 7% of observations report CRN and the average number of outpatient visits is about 8.

Individual Characteristics: Panel C of Table 1 reports the descriptive statistics of individual characteristics of our sample respondents. About half of respondents are between 65 and 74, and the other half are 75 or older. Among our respondents, 42% are male, 85% are white and 12% are Black, and 36%, 34% and 13% have high school degrees, college degrees, and graduate degrees, respectively. Household incomes are about equally distributed in the categories of: below 20K, 20-35K, 35-65K and above 65K. Arthritis and high blood pressure are the two most common chronic health problems (70% and 69%) of HRS respondents.

We merge the market-level measures of market share to the HRS individual-level dataset with the use of interview year and state identifiers. Consequently, our working sample contains 25,811 observations from 10,458 individuals residing in 50 states over the even-year period 2010-2016.

3.2 Plan-Level Data

We construct a part of the treatment variable with ***Market Share,*** from the CMS dataset. Specifically, using 2010 data from market j, we define:

$$\boldsymbol{Market\ Share_j = 100\% * \left(\frac{Enrollment\ in\ CVS\ \&\ Universal\ in\ Market\ j}{Total\ Enrollment\ in\ Market\ j}\right.}$$

$$- \frac{\textbf{\textit{Enrollment in CVS}} \,\&\, \textbf{\textit{Universal in the US}}}{\textbf{\textit{Total Enrollment in the US}}})$$

Figure 3 depicts the distribution of ***Market Share*** across markets. The market share is centered around 0, with most regions clustered near this value and -0.29% on average. Alabama and Tennessee are examples of CMS markets having ***Market Share*** close to the average at -0.33%. The distribution is slightly right skewed, with a longer tail extending into positive values, indicating some markets have significantly higher market shares. ***Market Share*** varies widely, ranging from approximately -14% (market 28, Arizona) to 20% (market 21, Louisiana), demonstrating substantial variability across markets.

Finally, we construct outcome variables capturing potential mechanisms using the plan-level dataset. We employ various sets of plan characteristics as potential mechanisms, namely (1) price - the log of average monthly premium, (2) plan quality - whether a plan is an enhanced plan and the plan's star rating (enhanced plans can have a lower/zero deductibles, reduced cost sharing, and/or higher initial coverage limits than the standard benefit design (KFF, 2018); star rating is a quality rating calculated by CMS[5]), and (3) plan access - whether a plan requires step therapy (requirement to try a lower cost drug before "stepping up" to a similar-acting, but more expensive drug[6]); whether a plan has a quantity limit restriction; whether a plan has a specialty tier (a tier containing high cost products which must meet a certain monthly dollar threshold as set by CMS; products in this tier are typically limited to a percentage coinsurance of 25%, and cannot exceed 33%[7]); percentages of drug types covered by this plan (calculated as the number of distinct drugs

[5] Five-star rating methodology from CMS: https://www.cms.gov/medicare/provider-enrollment-and-certification/certificationandcomplianc/downloads/brieffivestartug.pdf
[6] More information about step therapy: https://www.healthinsurance.org/glossary/step-therapy/
[7] Definition: https://resdac.org/cms-data/variables/specialty-tier

covered by this plan / total number of distinct drugs covered in the CMS market this year) and the number of in-network pharmacies per 10,000 seniors. These plan characteristics capture price, the plan's quality and the plan's accessibility of drugs, which may be mechanisms through which the merger affects beneficiaries' decisions about enrollment in PDPs and OOP drug expenditures.

4. Empirical Model

This section outlines the empirical model, which is specified for respondent $\boldsymbol{i}$ living in market $\boldsymbol{j}$ in year $\boldsymbol{t}$ as follows:

$$\boldsymbol{Y_{ijt}} = \boldsymbol{\alpha} \times \boldsymbol{Merger_t} \times \boldsymbol{Market\ Share_j} + \boldsymbol{x_{it}\beta} + \gamma_j + \gamma_t + \boldsymbol{Trend_{jt}} + \boldsymbol{\varepsilon_{ijt}} \qquad \textbf{(1)}$$

The outcome $\boldsymbol{Y_{ijt}}$ includes Medicare Part D stand-alone PDP enrollment, OOP drug expenditures for PDP enrollees, CRN, outpatient visits, MAPD enrollment and OOP drug expenditures for MAPD enrollees. The variables of interest are $\boldsymbol{Merger_t}$ and $\boldsymbol{Market\ Share_j}$. The variable $\boldsymbol{Merger_t}$ is an indicator taking the value 1 for year > 2011 and 0 otherwise. We include a vector of demographic characteristics $\boldsymbol{x_{it}}$ of individual $\boldsymbol{i}$ in year $\boldsymbol{t}$ (see Panel C, Table 1). We also include CMS market fixed effects (FEs) γ_j and year FEs γ_t to control for unobserved heterogeneity and time variation in the outcome variables. Further, we include market-specific time trends $\boldsymbol{Trend_{jt}}$ to control for unobserved trends in Medicare Part D program enrollment and health care utilization across markets.

We employ distinct strategies to estimate Equation (1) because the outcomes have different distributional properties. For stand-alone PDP enrollment, MAPD enrollment and CRN, which are binary variables, we estimate Equation (1) as a linear probability model with OLS. For OOP drug

expenditures, we follow Mullahy (1998) and estimate Equation (1) with a two-part model (TPM) because there is a mass of zeros for OOP, approximately 26.1% (6,736 out of 25,811). The first part is a probit model with the indicator 1{OOP >0}, while the second part is a generalized linear model (GLM) with gamma error distribution and a log link function. Analogously, we employ a TPM to estimate Equation (1) with outpatient visits as the outcome variable, where 5.75% (1,483 out of 25,811) of the observations are zero values.

5. Results

We first discuss the main findings and then discuss robustness checks. Subsequently, we explore the heterogeneities in our results, consider other outcome variables and examine the potential channels leading to our main results.

5.1 Main Findings

Table 2 Panel A presents the empirical results of Equation (1). Column 1 presents the coefficient of the linear probability model for stand-alone PDP enrollment. Column 2 presents the coefficients from the probit model (the first part of the model) that estimates the probability of reporting any positive OOP drug expenditures. Column 3 presents the coefficients from the second part, the GLM model (second part of the model) estimating the relationship among those who reported positive OOP drug expenditure. Column 4 presents the average marginal effects from the combined first and second parts of the model.

Column 1 reports that the coefficient for ***Merger*** × ***Market Share*** is negative and significant. This suggests that the merger discourages stand-alone PDP enrollment more in markets where the merging insurers have a higher combined market share before the merger. Specifically, in market

20 (Mississippi), the merging insurers hold a 0.58% above the national average (positive and closest to the average value) ***Market Share***. The merger will lead market 20 to experience a 0.17 percentage point [0.58 × 0.003] decrease in stand-alone PDP enrollment relative to the average market, and such a reduction in stand-alone PDP enrollment is about 0.5% of its average, i.e. 32 percentage points.

Columns 2 to 4 report the results from the TPM for OOP drug expenditures; in particular, the coefficients for ***Merger*** × ***Market Share*** are negative and significant. These results suggest that, in the markets where the merging insurers have a higher market share, individuals incur higher OOP drug expenditures. To interpret the economic significance of our results, we consider the following hypothetical scenario: presuming all other factors remain constant, if a PDP enrollee were to move from the average market to market 20 (Mississippi) with ***Market Share*** at 0.58%, their monthly OOP drug expenditures would increase by $5.98 [0.58 × 10.312]. This increase is about 11.6% of the average monthly OOP of PDP enrollees at $51.71.

5.2 Robustness Checks

We perform several robustness checks of our treatment variables and specifications.

(1) Alternative measures of treatment.

To mitigate the influence of outliers in ***Market Share***, we use a dummy variable ***High Market Share*** indicating whether the market share exceeds the average, rather than relying on exact value of ***Market Share***. The result is reported in Table 2 Panel B. Specifically, in markets with ***Market Share*** higher than the average, the merger will lead those markets experiencing a 24.5 percentage point decrease in stand-alone PDP enrollment relative to the average-or-lower market share

markets. Stand-alone PDP enrollees in those markets increase their OOP drug expenditures by $21.95 relative to those in the average-or-lower markets after the merger.

To enhance the robustness of our findings, we undertook a supplementary analysis utilizing enrollment data exclusively from CVS as a measure of ***Market Share*** in Table 2 Panel C. This allows for a direct assessment of the merger's impact on a major player in the market. By concentrating on CVS's enrollment figures, we can more precisely capture the shifts in consumer behavior and enrollment patterns that can be directly linked to the merger. The coefficient of OOP shows that, on average, the effects on OOP are similar as the case when using CVS and Universal's enrollment, which suggests that the merger's overall impact on market concentration and enrollment remains consistent regardless of how market share is measured.

5.3 Heterogeneities

This section performs sub-sample analyses to examine the sources of variation that generate the main findings reported in Table 2. Specifically, we estimate Equation (1) by dividing the sample according to different criteria: number of chronic diseases (below 3 v. 3 and above), self-reported health rating ("Good" or above: including "Good", "Very Good" and "Excellent" v. Below "Good": including "Fair" and "Poor"), total household income (below or equal to mean, which is $60,778 in our sample, v. higher than mean), and age (under 75 v. equal to or above 75).

Panel A in Table 3 shows that, in markets where merging insurers have a higher combined market share, the merger has a positive impact on stand-alone PDP enrollment and leads to a greater increase in OOP drug expenditures among individuals with three or more chronic diseases. Panel B employs self-reported health status to classify our sample individuals. We expect individuals to report better (worse) health are likely to be those with fewer (more) chronic diseases. Indeed, the results based on the sub-sample with worse self-reported health resemble those of the

sub-sample with more chronic diseases. These results suggest that sicker individuals are less likely to switch away from stand-alone PDPs than healthier individuals potentially due to their higher medication needs. As a result, the merger increases sicker individuals' OOP drug expenditures more than their healthier counterparts.

The findings in Panel C indicate that, in markets where merging insurers have a higher market share, the merger has a stronger positive effect on OOP drug expenditures for the sub-samples of individuals aged 75 and above, but the merger effect on stand-alone PDP enrollment does not depend on age. Panel D presents subsample analyses by total household income. Our results indicate that, in markets where merging insurers hold a larger combined market share, poorer individuals are less likely to exit stand-alone PDPs after the merger and, for those staying in stand-alone PDPs, they have higher OOP drug expenditures. These results suggest that these poorer individuals may have fewer alternatives to stand-alone PDPs, such as employer-sponsored plans.

In sum, the findings in Tables 2-3 indicate that the merger led to (1) HRS respondents being less likely to be enrolled in PDPs and (2) HRS respondents facing higher OOP drug costs if they chose to stay in PDPs. HRS respondents in worse health are less likely to leave PDPs after the merger compared to healthier respondents, consistent with the idea that they have fewer plan options that meet their needs, and/or possibly face higher cognitive burden in choosing plans, compared to healthier respondents. In a later section, we will explore potential mechanisms, such as premiums and plan quality and access, that may be driving these results.

5.4 Other Outcomes

This section examines other health care utilization outcomes to explain and elaborate on our main findings. The results are reported in Table 4.

5.4.1 CRN

Column 1 employs CRN as the outcome variable. The coefficient for ***Merger*** × ***Market Share*** is negative and significant, in markets where merging insurers have a higher combined market share, the merger led to a decrease in CRN reports from PDP enrollees. For example, stand-alone PDP enrollees in Mississippi report 0.12 percentage points [0.58 × 0.2 as ***Market Share*** in market 20 (Mississippi) is 0.58%] lower CRN relative to those in the average market after the merger. The reduction in CRN is equivalent to 1.7% of the average CRN reported in Table 1 Panel A.

Although the merger is associated with increases in OOP spending on medications, a reduction in CRN is still plausible since the merger may affect both the prices paid and the quantities consumed of drugs, as well as other factors related to CRN, such as the pharmacy utilized. Our findings thus far cannot shed light on the mechanisms leading from the nationwide merger to the reduced CRN at the individual level. The most likely mechanism is that the merger leads to changes in plan characteristics, affecting CRN. We explore this possibility below.

5.4.2 Outpatient Visits

The previous results suggest that the merger leads to higher OOP drug expenditures. Here, we examine whether increases in OOP drug expenditures affects other health care utilization among stand-alone PDP enrollees. For example, if the merger affects drug utilization or drug access, this could indirectly affect outpatient use since individuals would need outpatient providers to prescribe and monitor medication use, and to address any issues related to adherence. Column 2 of Table 4 explores the spillover effect of merger by examining outpatient visits. The coefficient for ***Merger*** × ***Market Share*** is negative and significant. For example, stand-alone PDP enrollees in Mississippi would experience a 0.54 [0.58 × 0.93 as ***Market Share*** in market 20 (Mississippi)

is 7.46%] decrease in outpatient visits relative to those in the average market after the merger, which accounts for approximately 6.6% of the average number of outpatient visits. This result suggests that the merger in the stand-alone PDP market produces a negative spillover effect on health care utilization. This effect on outpatient utilization is hard to interpret since the reasons for the outpatient visits is unknown; ideally, it would be useful to know the portion of these visits that were related to prescription drug use monitoring and adherence issues.

5.4.3 MAPD

Column 3 reports that the coefficient for ***Merger*** × ***Market Share*** is negative and significant. For example, comparing market 20 (Mississippi) to the average market, the merger decreases about 0.06 percentage points [0.58 × 0.1] of MAPD enrollment, equating to approximately 0.21% of its mean, i.e. 28 percentage points. Column 4 reports the results from the TPM for OOP drug expenditures for MAPD enrollees. The coefficient for the ***Merger*** × ***Market Share*** is positive and significant. If an MAPD enrollee was moved from the average market to the market 20 (Mississippi), their monthly OOP drug expenditure would increase by about $2.25 [0.58 × 3.880 as ***Market Share*** in market 20 (Mississippi) is 0.58%] after the merger. This increase is about 5.25% of the average monthly OOP drug expenditure of MAPD enrollees at $42.83. The merger effects on MAPD enrollment and OOP drug expenditure of MAPD enrollees are smaller than those on stand-alone PDP enrollment and OOP drug expenditure of stand-alone PDP enrollees.

One explanation for this result is there can be the substitution between stand-alone PDP and MAPD plans. The merger not only softens the competition in the stand-alone PDP market but also softens the competition between stand-alone PDP and MAPD plans. As a result, MAPD enrollees face worse plans and experience higher OOP drug expenditures.

5.5 Potential Channels

This section explores the potential channels through which individuals respond to the merger in the stand-alone PDP market. As discussed previously, we employ various sets of plan characteristics: (1) log of average monthly premium (price); (2) whether a plan is an enhanced plan and its star rating (quality); and (3) whether a plan requires step therapy, whether a plan has a quantity limit restriction, whether a plan has a specialty tier, percentages of drug types covered by this plan and the number of in-network pharmacies per 10,000 seniors (drug access).

Table 5 reports a plan-year level regression of those plan characteristics on **Merger × CVS Plan**, where CVS Plan is an indicator for whether this plan is managed by CVS, CMS market FEs, Plan FEs and Year FEs. We hypothesize that CVS will adjust their plan characteristics after the merger. Such changes in plan characteristics are potential mechanisms underlying the behavioral changes reported in the previous section, especially in markets where the merging insurers have a higher combined market share.

Column 1 reports that the coefficients of **Merger × CVS Plan** are positive and significant for the premium outcome variable. Specifically, CVS increases the premiums of their plans by close to 20% after the merger. It suggests that the merger increases the premiums paid by individuals staying in CVS plans, which tightens their financial constraints. After the merger, CVS plans are less likely to be enhanced (Table 5, Col. 2) and are more likely to have an exact star rating at 3-star (Table 5, Cols. 3-5). Despite the increased premiums of CVS plans after the merger, there is no clear evidence indicating that their plan quality increases.

Column 8 reports that the coefficients of **Merger × CVS Plan** are positive and significant, suggesting that CVS stand-alone PDPs increase the proportion of prescription drugs that are in the

specialty tier. Drugs in this tier (such as cancer drugs) require a higher coinsurance from enrollees. Column 9 also reports that the proportion of prescription drugs covered by CVS plans falls after the merger. Potentially, these two effects increase the OOP drug expenditures of enrollees in CVS plans after the merger.

However, Columns 6 and 7 report that the coefficients of **Merger × CVS Plan** are negative and significant, while Column 10 reports that the coefficient of **Merger × CVS Plan** is positive and significant. CVS stand-alone PDPs reduce the requirements of step therapy and quantity limitation of drug and increase the density of their in-network pharmacies after the merger. These findings suggest that despite the increased OOP drug expenditures, CVS plans improve access to prescription drugs by reducing administrative and travel burdens in accessing medications.

Overall, the evidence suggests that the merger enhances the market power of CVS, leading to higher premiums. Such market power is expected to be larger in markets where CVS and Universal have a higher combined market share. Therefore, we interpret that this market power effect reduces enrollment in PDPs and raises OOP drug expenditures for enrollees who remain in PDPs after the merger. Our findings also suggest that the merger leads to a re-positioning of the product. CVS plans after the merger are less likely to be enhanced, cover fewer drugs, and have more specialty tier drugs, but are also less likely to have step therapy and quantity limitations, and there is greater in-network pharmacy access. Some of these changes – such as greater pharmacy access – may be driving the reduction in CRN and possibly even the reduction in outpatient visits associated with the merger.

5 Conclusion

This study investigates the impact of the CVS-Universal merger in the Medicare Part D stand-alone PDP market, focusing on its effects on beneficiaries' program enrollment and OOP drug

expenditures. Our main findings, based on individual-level data from the HRS, indicate that the merger leads to reduced enrollment in PDPs. Individuals who remain in PDPs after the merger have higher OOP drug expenditures. Our findings suggest that sicker individuals are less likely to switch away from stand-alone PDPs in response to the merger. When they stay with the stand-alone PDP, they typically have OOP drug expenditures than other individuals.

We also find some spillover effects on other outcomes. The merger reduces the number of outpatient visits among stand-alone PDP enrollees and potentially softens the competition from MAPD plans. Finally, our findings suggest that the merger led to increases in premiums, and narrower coverage of drugs, leading to higher OOP for beneficiaries who stayed in PDPs after the merger (e.g., sicker people). At the same time, some aspects of plan quality related to drug access improved, leading to reductions in CRN and, more tentatively, fewer outpatient visits among PDP enrollees**.** In sum, the effects of the merger are mixed for consumers. They bear the burden of higher OOP spending and higher premiums after the merger, but effects on their access to drugs is mixed – there are some positive changes to plans as well as some negative changes.

Our study highlights the policy implication that industry consolidation in the Medicare Part D market may hinder program enrollment and increase consumers' drug expenditures. Importantly, the benefits delivered by Medicare Part D are partially counterbalanced by the ramifications of industry consolidation. While extant literature (Abaluck & Gruber, 2011; Kling et al., 2012; Heiss et al., 2013) posits that industry consolidation in the Medicare Part D market might facilitate improved decision-making among consumers through reducing their plan offerings, our results underscore a critical policy consideration.[8] Policymakers need to navigate a balance between the potential benefits of enhanced decision-making and the drawbacks of reduced enrollment of Part D program and increased financial burdens imposed on beneficiaries. This insight is pivotal for informing policy aimed at optimizing the evolving Medicare Part D market.

[8] Over the period 2009-2016, the number of standalone PDPs available decreases from 2,366 to 1,234 amid the number of insurers decreases from 65 to 51.

References

Abaluck, J., & Gruber, J. (2011). Choice Inconsistencies among the Elderly: Evidence from Plan Choice in the Medicare Part D Program. *American Economic Review*, *101*(4), 1180–1210.

Anderson, G. F., Hussey, P., & Petrosyan, V. (2019). It's still the prices, stupid: why the US spends so much on health care, and a tribute to Uwe Reinhardt. *Health Affairs*, 38(1), 87-95.

Chorniy, A., Miller, D., & Tang, T. (2020). Mergers in Medicare Part D: Assessing market power, cost efficiencies, and bargaining power. *International Journal of Industrial Organization*, *68*, 102548.

Dafny, L. (2021) How Health Care Consolidation Is Contributing to Higher Prices and Spending, and Reforms That Could Bolster Antitrust Enforcement and Preserve and Promote Competition in Health Care Markets. Testimony to the U.S. House Committee on the Judiciary Subcommittee on Antitrust, Commercial and Administrative Law.

Dafny, L., Duggan, M., & Ramanarayanan, S. (2012). Paying a Premium on Your Premium? Consolidation in the US Health Insurance Industry. *American Economic Review*, *102*(2), 1161–1185.

Dafny, L., Gruber, J., & Ody, C. (2015). More insurers lower premiums: Evidence from initial pricing in the health insurance marketplaces. *American Journal of Health Economics*, 1(1), 53-81.

Damberg, C.L. (May 17, 2023). Health Care Consolidation: The Changing Landscape of the U.S. Health Care System. Testimony Before the Committee on Ways and Means Subcommittee on Health, United States House of Representatives. Available at: https://www.rand.org/content/dam/rand/pubs/testimonies/CTA2700/CTA2770-1/RAND_CTA2770-1.pdf. Accessed 2/27/24.

Duggan, M., & Morton, F. S. (2010). The Effect of Medicare Part D on Pharmaceutical Prices and Utilization. *American Economic Review*, *100*(1), 590–607.

Engelhardt, G. V., & Gruber, J. (2011). Medicare Part D and the Financial Protection of the Elderly. *American Economic Journal: Economic Policy*, *3*(4), 77–102.

Fulton, B. D. (2017). Health care market concentration trends in the United States: evidence and policy responses. *Health Affairs*, 36(9), 1530-1538.

Hartman, M., Martin, A.B., Whittle, L. & Catlin, A. (2023). National health care spending in 2022: Growth similar to prepandemic rates. *Health Affairs*, 43(1), 6-17.

Heiss, F., Leive, A., McFadden, D., & Winter, J. (2013). Plan selection in Medicare Part D: Evidence from administrative data. *Journal of Health Economics*, *32*(6), 1325–1344.

Hill, N., & Wagner, M. (2021). Heterogeneous effects of consolidation on premiums in Medicare Part D. *Journal of Health Economics*, *80*, 102521.

Ho, K. & Lee, R.S. (2017). Insurer Competition in Health Care Markets. *Econometrica*, 85(2): 379-417.

Hoadley, J. (2006). *Medicare's New Adventure: The Part D Drug Benefit*.

Kaiser Family Foundation (KFF), (October 18, 2023) 2023 Employer Health Benefits Survey. Available at: https://www.kff.org/report-section/ehbs-2023-summary-of-findings/

Kaiser Family Foundation (KFF), (Nov. 22, 2024). "Medicare Part D in 2025: A First Look at Prescription Drug Plan Availability, Premiums, and Cost Sharing," https://www.kff.org/medicare/issue-brief/medicare-part-d-in-2025-a-first-look-at-prescription-drug-plan-availability-premiums-and-cost-sharing/

Keisler-Starkey, K., Bunch, L.N. & Lindstrom, R.A. (September 2023). Health Insurance Coverage in the United States: 2022 Available at: https://www.census.gov/content/dam/Census/library/publications/2023/demo/p60-281.pdf

Ketcham, J. D., & Simon, K. I. (2008). Medicare Part D's Effects on Elderly Patients' Drug Costs and Utilization. *American Journal of Managed Care*, *14*(11), 10.

Kling, J. R., Mullainathan, S., Shafir, E., Vermeulen, L. C., & Wrobel, M. V. (2012). Comparison friction: Experimental evidence from medicare drug plans. *Quarterly Journal of Economics*, *127*(1), 199–235.

Melnick, G. A., Shen, Y. C., & Wu, V. Y. (2011). The increased concentration of health plan markets can benefit consumers through lower hospital prices. *Health Affairs*, 30(9), 1728-1733.

Mullahy, J. (1998). Much ado about two: Reconsidering retransformation and the two-part model in health econometrics. *Journal of Health Economics*, *17*(3), 247–281.

Nelson, R. E., Nelson, S. L., Huttner, B., & Gundlapalli, A. (2014). The effect of Medicare Part D on health care utilization for non-elderly Medicare recipients with disabilities. *Disability and Health Journal*, *7*(1), 64–69.

Park, Y. J., & Martin, E. G. (2017). Medicare Part D's Effects on Drug Utilization and Out-of-Pocket Costs: A Systematic Review. *Health Services Research*, *52*(5), 1685–1728.

RAND (2022). Environmental Scan on Consolidation Trends and Impacts in Health Care Markets.

Scheffler, R. M., & Arnold, D. R. (2017). Insurer market power lowers prices in numerous concentrated provider markets. *Health Affairs*, 36(9), 1539-1546.

Scheffler, R. M., Arnold, D. R., Fulton, B. D., & Glied, S. A. (2016). Differing impacts of market concentration on Affordable Care Act Marketplace premiums. *Health Affairs*, *35*(5), 880-888.

Telesford, I., Wager, E., Amin, K. & Cox, C. (October 23, 2023). How does the quality of the U.S. health system compare to other countries? Peterson-KFF Health System Tracker, Available at: https://www.healthsystemtracker.org/chart-collection/quality-u-s-healthcare-system-compare-countries/. Accessed 2/27/24.

Trish, E. E., & Herring, B. J. (2015). How do health insurer market concentration and bargaining power with hospitals affect health insurance premiums?. *Journal of Health Economics*, 42, 104-114.

US Department of Justice. (Press release, October 10, 2018). Justice Department Requires CVS and Aetna to Divest Aetna's Medicare Individual Part D Prescription Drug Plan Business to Proceed with Merger. Available at: https://www.justice.gov/opa/pr/justice-department-requires-cvs-and-aetna-divest-aetna-s-medicare-individual-part-d.

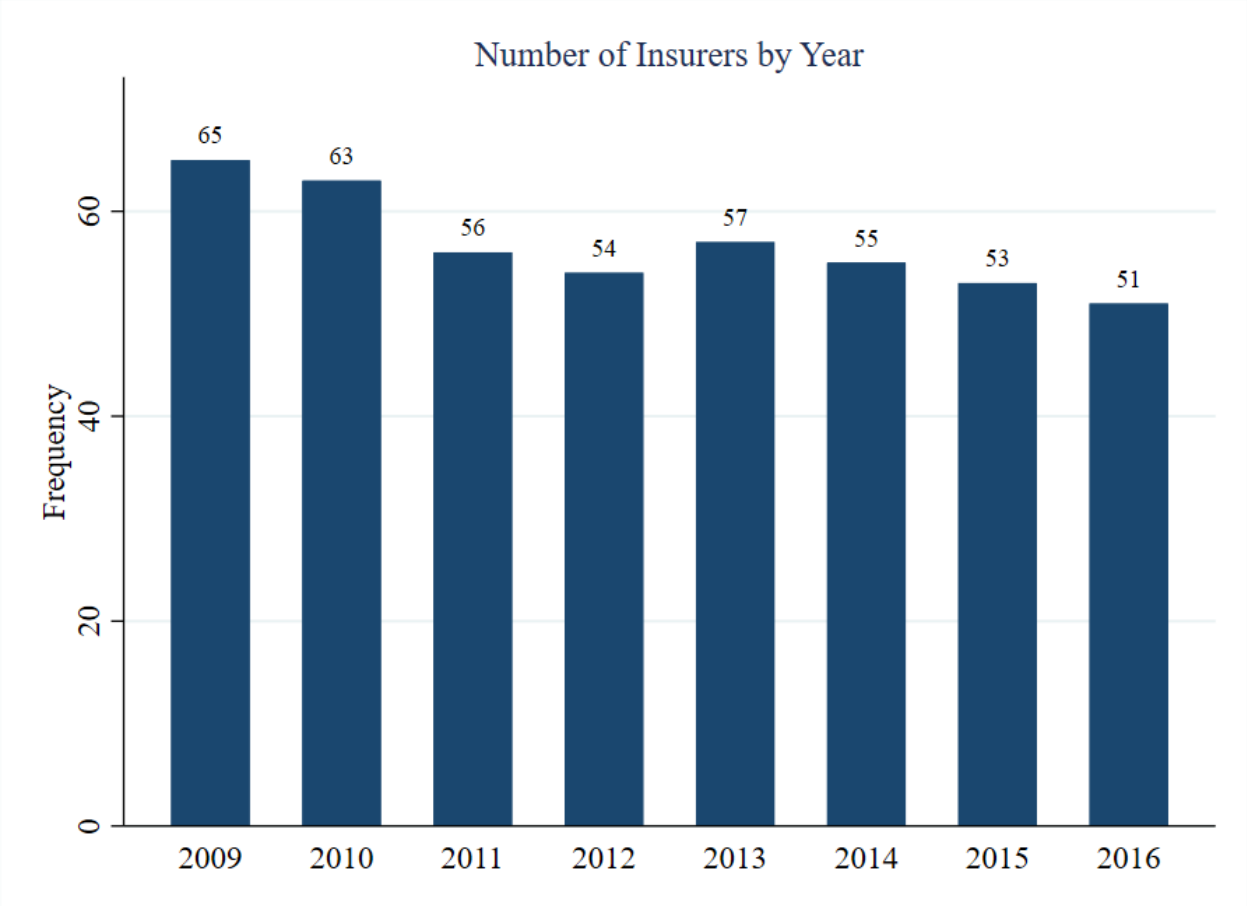


Figure 1. Trend in Number of Insurers Offering PDPs

Source: CMS landscape files; CMS Monthly Enrollment by Contract/Plan/State/County files.

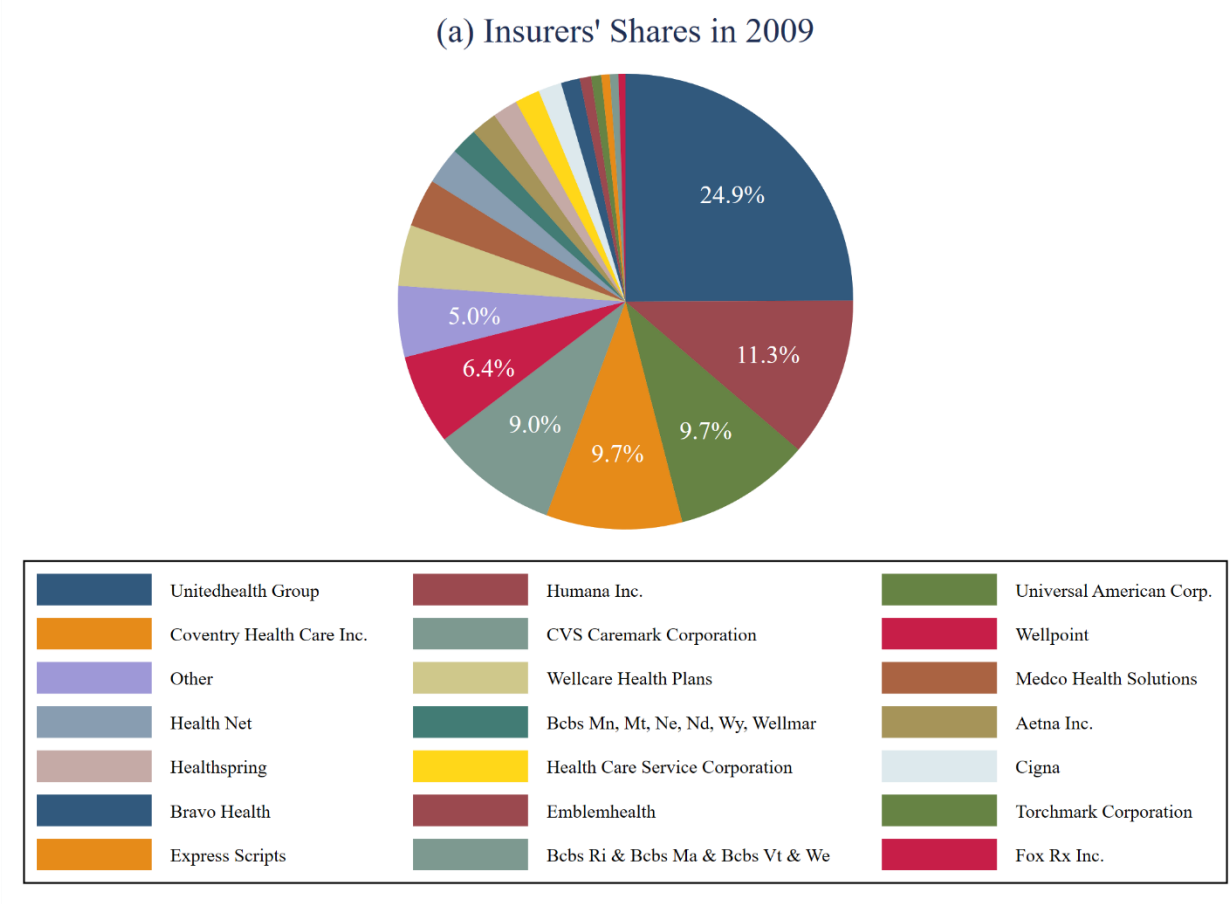


Figure 2a. Market Shares of Top 20 Insurers in 2009

Source: CMS landscape files; CMS Monthly Enrollment by Contract/Plan/State/County files, calculated by authors.

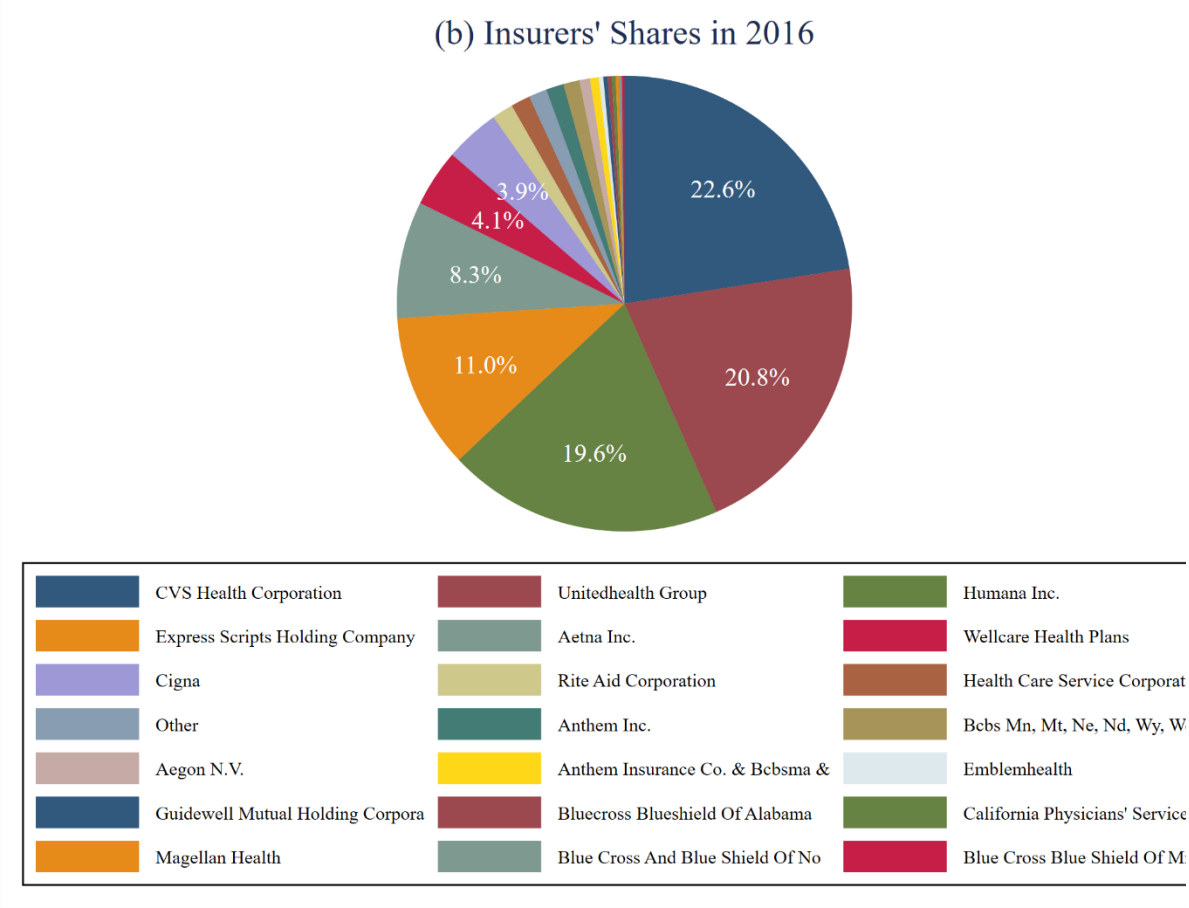


Figure 3b. Market Shares of Top 20 Insurers in 2016

Source: CMS landscape files; CMS Monthly Enrollment by Contract/Plan/State/County files, calculated by authors.

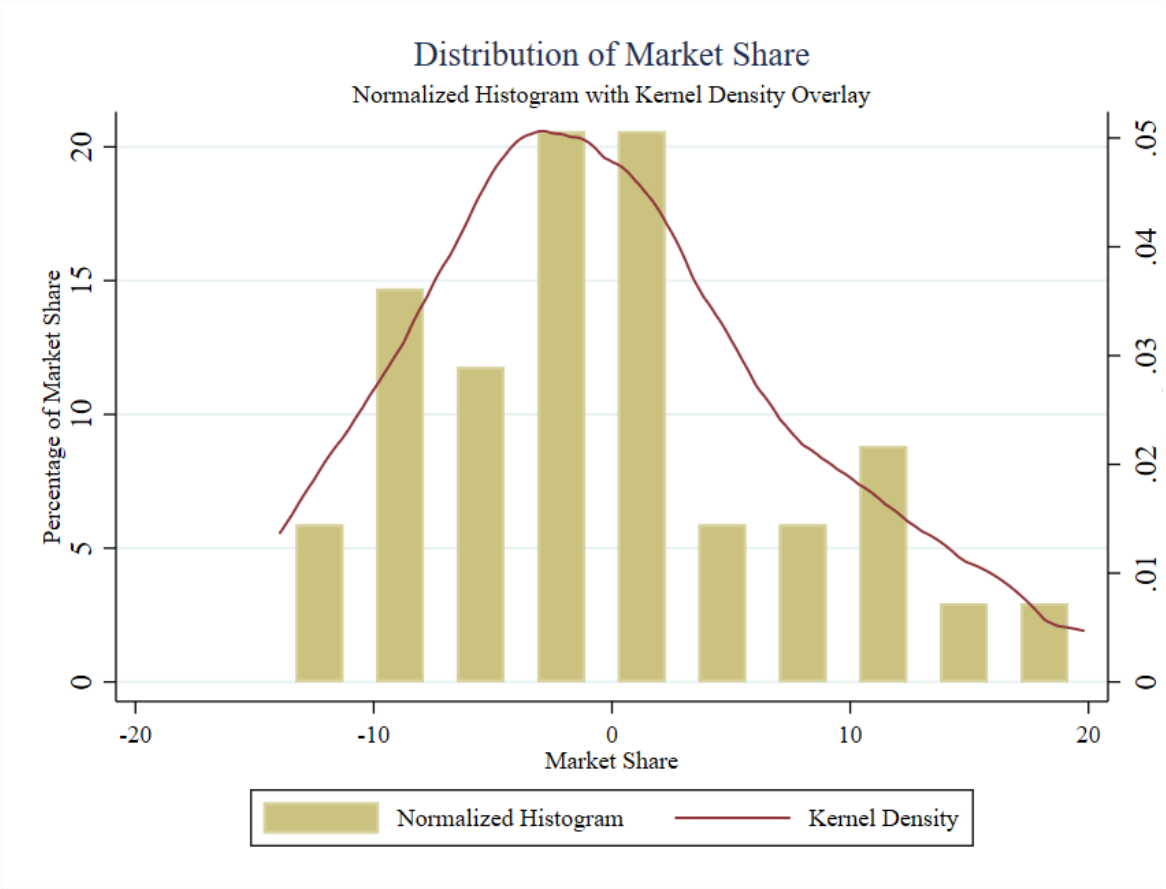


Figure 4. Distribution of Market Share in 2010

Source: CMS landscape files; CMS Monthly Enrollment by Contract/Plan/State/County files.

Table 1. Descriptive Statistics

	Mean	SD	N
Panel A: Outcomes			
Full sample			
Enrolled in PDP	0.32	0.47	25,811
OOP (including zeros)	45.74	57.05	25,811
Enrolled in MAPD	0.28	0.45	25,811
PDP enrollees only			
OOP (including zeros)	51.71	60.14	8,292
CRN	0.07	0.26	8,292
Outpatient Visits	8.20	8.08	8,292
MAPD enrollees only			
OOP (including zeros)	42.83	55.07	7,292
Panel B: Treatment			
Merger	0.77	0.42	25,811
Market Share	-0.29	7.94	34
Panel C: Individual Characteristics			
Age 75-84	0.40	0.49	25,811
Age 85-94	0.13	0.33	25,811
Age 95+	0.01	0.10	25,811
Male	0.42	0.49	25,811
Married	0.58	0.49	25,811
White	0.85	0.36	25,811
Black	0.12	0.32	25,811
Graduated from High School	0.36	0.48	25,811
Has College Degree	0.34	0.47	25,811
Has Graduate Degree	0.13	0.33	25,811
Household Income 20K-35K	0.25	0.43	25,811
Household Income 35K-65K	0.29	0.45	25,811
Household Income 65K+	0.26	0.44	25,811
High Blood Pressure	0.69	0.46	25,811
Diabetes	0.25	0.43	25,811
Cancer	0.21	0.41	25,811
Heart	0.32	0.47	25,811
Stroke	0.09	0.28	25,811
Arthritis	0.70	0.46	25,811
Lung disease	0.11	0.32	25,811

Heath Rating - Excellent	0.08	0.26	25,811
Heath Rating – Very Good	0.32	0.47	25,811
Heath Rating – Good	0.36	0.48	25,811
Heath Rating – Fair	0.19	0.39	28,613
Heath Rating – Poor	0.06	0.24	28,613
Panel D: Plan Characteristics			
Ln Premium	3.78	0.49	6,829
Enhanced Plan	0.50	0.50	6,829
< 3-star rating	0.21	0.41	6,829
3-star rating	0.20	0.40	6,829
>3-star rating	0.59	0.49	6,829
Step Therapy	0.97	0.17	6,613
Quantity Limitation	0.98	0.12	6,613
Specialty Tier	0.89	0.31	6,613
Drug Coverage	0.85	0.13	6,613
Density of in-network pharmacies	13.51	5.92	6,613

Note: Panels A-C employ the sample including data from the 2010-2016 HRS waves. The unit of observation is an individual-year combination. Panel D employs the sample including 2010-2016 data from CMS landscape files and Prescription Drug Plan Formulary, Pharmacy Network, and Pricing Information Files. The unit of observation is a plan-state-year combination.

Table 2. Effects of Merger on PDP Enrollment and OOP of PDP Enrollees

	Enrollment	Any OOP	OOP	OOP
Model	LPM	TPM	TPM	Combined TPM
		1st Part Probit	2nd Part GLM	Marginal Effects
Sample	All Individuals	PDP Enrollees	PDP Enrollees	PDP Enrollees
	(1)	(2)	(3)	(4)
Panel A: Benchmark				
Merger × Market Share	-0.003***	0.098***	0.167***	10.312***
	(0.000)	(0.008)	(0.007)	(0.385)
N. Observations	25,799	8,233	6,404	8,233
Robustness Checks				
Panel B: Market share – Higher than average				
Merger × High Market Share	-0.245***	0.215***	0.354***	21.951***
	(0.006)	(0.035)	(0.040)	(2.163)
N. Observations	25,799	8,233	6,404	8,233
Panel C: Market share- Enrollment in CVS plans only				
Merger × Market Share	-0.001***	0.063***	0.107***	6.579***
	(0.000)	(0.005)	(0.005)	(0.246)
N. Observations	25,799	9,088	6,404	8,233
Mean Value of Dep Var.	0.32			51.71
Individual-level control var.	Yes	Yes	Yes	Yes
CMS Market FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Market-specific time trend	Yes	Yes	Yes	Yes

Note: The unit of observation is an individual-year combination. The individual-level control variables are listed in Panel C of Table 1. Robust standard errors in parentheses. Significance *p<10%; **p<5%; ***p<1%.

Table 3. Heterogeneity Analysis - Enrollment and OOP of PDP Enrollees

Model	Enrollment LPM	OOP Combined TPM Marginal Effects
Sample	All Individuals	PDP Enrollees
	(1)	(2)
Panel A: Chronic Diseases		
Fewer than 3 chronic diseases	-0.006***	4.677***
Merger × Market Share		
	(0.000)	(0.593)
3 or more		
Merger × Market Share	0.003***	10.819***
	(0.000)	(0.973)
Panel B: Self-reported Health Rating		
Below "Good"		
Merger × Market Share	0.012***	8.533***
	(0.000)	(0.532)
"Good" or above		
Merger × Market Share	-0.004***	0.988
	(0.000)	(0.365)
Panel C: Age		
Under 75		
Merger × Market Share	-0.006***	-0.165
	(0.000)	(0.832)
75 and above		
Merger × Market Share	-0.004***	12.432***
	(0.000)	(0.745)
Panel D: Household Income		
Less or Equal to Mean		
Merger × Market Share	-0.001***	12.505***
	(0.000)	(0.354)
Higher than Mean		
Merger × Market Share	-0.004***	-18.782***
	(0.000)	(1.102)
Individual Control Variables	Yes	Yes
CMS Market FEs	Yes	Yes
Years FEs	Yes	Yes
Market-specific Time Trend	Yes	Yes

Note: Each panel represents two separate regressions for two sub-samples. The unit of observation is an individual-year combination. The individual-level control variables are listed in Panel C of Table 1. Robust standard errors in parentheses. Significance *p<10%; **p<5%; ***p<1%.

Table 4. Other Health Outcomes and MAPD Enrollment

Model	CRN LPM	Outpatient Visits Combined TPM Marginal Effects	MAPD Enrollment LPM	OOP Combined TPM Marginal Effects
Sample	PDP Enrollees	PDP Enrollees	All Individuals	MAPD Enrollees
	(1)	(2)	(3)	(4)
Merger × Market Share	-0.002***	-0.930***	-0.001***	3.880***
	(0.000)	(0.048)	(0.000)	(0.315)
N. Observations	8,287	8,212	25,799	7,259
Mean Value of Dep Var.	0.07	8.20	0.28	42.83
Individual Control Variables	Yes	Yes	Yes	Yes
CMS Market FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Market-specific time trend	Yes	Yes	Yes	Yes

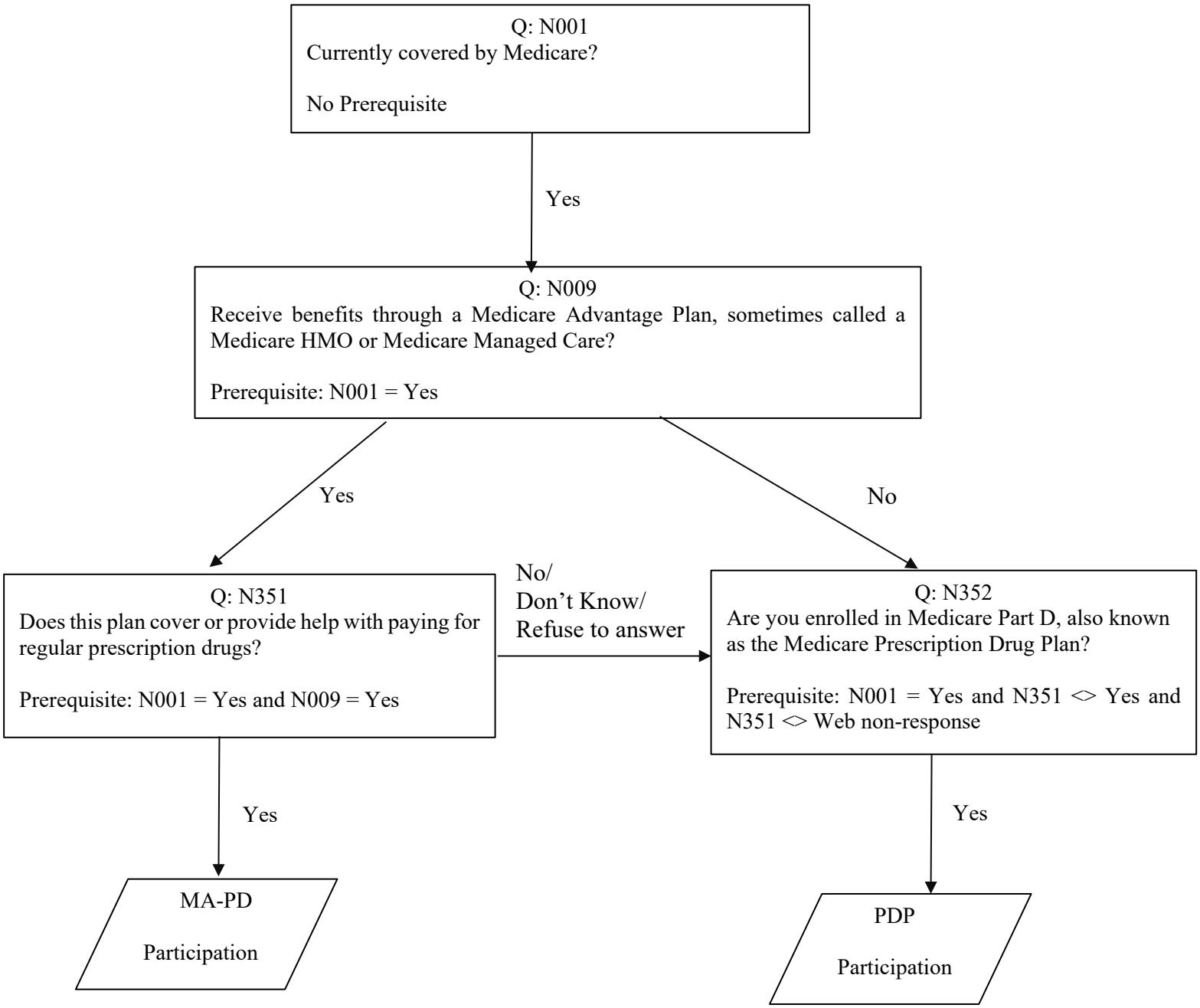
Note: The unit of observation is an individual-year combination. CRN = cost-related medication nonadherence. The individual-level control variables are listed in Panel C of Table 1. Robust standard errors in parentheses. Significance *p<10%; **p<5%; ***p<1%.

Table 5. Potential Mechanisms

	Ln (Premium)	Enhanced Plan (dummy)	Star rating < 3 (dummy)	Star rating = 3 (dummy)	Star rating > 3 (dummy)
	(1)	(2)	(3)	(4)	(5)
Merger × CVS plan	0.195***	-0.048***	-0.109***	0.253***	-0.144***
	(0.028)	(0.013)	(0.025)	(0.028)	(0.016)
Observations	6,070	6,070	6,070	6,070	6,070
	Step Therapy (dummy)	Quantity Limitation (dummy)	Specialty Tier (dummy)	Drug Coverage (%)	Density of in-network Pharmacies
	(6)	(7)	(8)	(9)	(10)
Merger × CVS plan	-0.091***	-0.076***	0.110***	-0.013**	0.410*
	(0.013)	(0.022)	(0.044)	(0.006)	(0.228)
Observations	5,689	5,689	5,689	5,689	5,689
CMS Market FE	Yes	Yes	Yes	Yes	Yes
Plan FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Note: The sample period covers 2010-2016. The unit of observation is a plan-state-year combination. Premium is log of average monthly premium adjusted by 2010 CPI. Drug Coverage is calculated by Number of distinct drugs covered by this plan / Total number of distinct drugs covered in the CMS market this year. No of in-area Pharmacy represented number of pharmacies per 10,000 seniors in plan's service area are included in this plan's network. Robust standard errors in parentheses and clustered at plan level. Significance *p<10%; **p<5%; ***p<1%.

Figure A1: Questions about Part D Participation in HRS Survey



Note: Figure A1 summarizes the logic we used to determine Medicare Part D participation status based on a series of survey questions. It starts with one initial question: whether the respondent is currently covered by Medicare (Q:N001) with no prerequisites. Our analytic sample excludes dual eligibles (beneficiaries with both Medicare (Q:N001) and Medicaid (Q:N006)). If it is answered "Yes," the respondent is then asked whether they receive Medicare through an HMO/MA plan (Q:N009).

If the respondent reports receiving benefits, they are asked if their HMO covers regular prescription drugs (Q:N351). If the answer is "Yes," they are categorized as participating in a Medicare Advantage Prescription Drug Plan (MA-PD). If the answer to Q:N351 is "No" or “Refuse to answer” or “Don’t know”, the next question asks whether the respondent is enrolled in Medicare Part D (Q:N352). Answering "Yes" here leads to classification as participating in a stand-alone Prescription Drug Plan (PDP).
If the respondent reports not receiving benefits, they will skip to “Q:N352” and be asked whether enrolled in Medicare Part D.