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Christopher Afendulis
Anna Sinaiko
Richard Frank

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ABSTRACT

Research in behavioral economics suggests that certain circumstances, such as large numbers of complex options or revisiting prior choices, can lead to decision errors. This paper explores the enrollment decisions of Medicare beneficiaries in the Medicare Advantage (MA) program. During the time period we study (2007-2010), private fee-for-service (PFFS) plans offered enhanced benefits beyond those of traditional Medicare (TM) without any restrictions on physician networks or additional cost, making TM a dominated choice relative to PFFS. Yet more than three quarters of Medicare beneficiaries remained in TM during our study period. We explore two possible explanations for this behavior: status quo bias and choice overload. Our results suggest that status quo bias plays an important role; the rate of MA enrollment was significantly higher among new Medicare beneficiaries than among incumbents. Our results also provide some evidence of choice overload; while the MA enrollment rate did not decline with an increase in the number of plans, among incumbent beneficiaries it failed to increase. Our results illustrate the importance of the choice environment that is in place when enrollees first enter the Medicare program.

Christopher Afendulis
Department of Health Care Policy
Harvard Medical School
180 Longwood Avenue
Boston, MA 02115
afendulis@hcp.med.harvard.edu

Anna Sinaiko
Department of Health Policy and Management
Harvard School of Public Health
677 Huntington Avenue, Rm 433
Boston, MA 02115
asinaiko@hsph.harvard.edu

Richard Frank
Department of Health Care Policy
Harvard Medical School
180 Longwood Avenue
Boston, MA 02115
and NBER
frank@hcp.med.harvard.edu

1. Introduction

The question of the role of consumer choice in health insurance markets has featured prominently in recent health policy debates, with advocates of expanded choice arguing that increasing plan choices will better match insurance products with the diverse preferences of consumers. Consumer choice of health plans is a significant feature in the current Medicare Advantage program, the Medicare Part D prescription drug benefit, and the health insurance exchanges created by the Affordable Care Act. However, a growing body of research in behavioral economics suggests that large numbers of complex choices can overwhelm consumers, either discouraging active choices or impeding efficient decisions. Recent empirical work in health economics suggests that choices made in health insurance markets where there are many complex options may result in errors (Abaluck and Gruber 2011; Frank and Lamiraud 2009). Nevertheless, it can be challenging to identify circumstances where complexity clearly results in errors: two recent examples are McWilliams et al. (2011) and Sinaiko and Hirth (2011).

In this paper, we explore the enrollment decisions of Medicare beneficiaries in the Medicare Advantage (MA) program. MA (also known as Medicare Part C) offers all Medicare beneficiaries the opportunity to join a privately run health plan instead of enrolling in the government-run, traditional Medicare (TM) program. Following program changes enacted through the Medicare Modernization Act of 2003, the MA program has seen tremendous growth: enrollment more than doubled from 7.1M in 2006 to 14.8M in 2013, and currently represents 29% all Medicare beneficiaries (Centers for Medicare & Medicare Services 2006, 2013). A principal source of this growth has to do with the generous payments offered to MA plans, often significantly higher than those made in the TM program, which have allowed MA plans to offer

enhanced benefits for enrollees including reduced cost sharing, partial or complete refunds of the Medicare Part B and/or Part D premiums, and additional services such as vision care.[1]

The increase in MA plans enrollment since the mid-2000s was accompanied by an increase in MA plan choices, and in particular, the availability of private fee-for-service (PFFS) plans. Unlike other plan offerings in the MA program that employ selective contracting and negotiate prices with providers, during the 2000s PFFS plans were not required to maintain a provider network. In addition, these plans were granted "deeming authority" in 2003, giving them the ability to impose prices from the TM fee schedule on providers (McGuire, Newhouse, and Sinaiko 2011). The Medicare Improvements for Patients and Providers Act (MIPPA) of 2008 changed the rules for PFFS plans and their role in the MA program starting in 2011, including the requirement that these plans have a physician network. We focus on the period before these changes were implemented, 2007-2010 and when the advent and expansion of this PFFS option offers an opportunity to better understand decision-making errors on the part of beneficiaries.

Like other MA plans, PFFS plans offer enhanced benefits beyond those of TM: reduced premiums for Medicare Part B or Part D, reduced cost sharing requirements, or additional benefits (e.g., vision coverage). Because PFFS plans offered these additional benefits without any restrictions on access to physicians, these plans were in effect a dominant alternative in comparison to TM. That is, for all possible health states for all beneficiaries, TM was no better than PFFS on some dimensions (e.g., provider choice) and worse than PFFS on other dimensions

[1] Insurers submit bids to CMS based on these payment rates. Most plans bid below the payment rates, and are legally required to share the "rebate" they receive from CMS (a portion of the difference between the benchmark and the bid) on benefits for enrollees.

(e.g., cost sharing).[2] For these reasons, neoclassical economic theory predicts that all beneficiaries should have preferred the PFFS option to TM. (It is less clear whether beneficiaries should have preferred a managed plan, such as an HMO or PPO, to a PFFS plan. These plans restrict provider choice, but may also pass on additional benefits, achieved from the savings due to their selective contracting efforts.) In the subset of counties we focus on in this paper, payment rates were particularly generous relative to TM, making it even more attractive than in other markets.

In spite of these expectations, more than three quarters of these Medicare beneficiaries remained in TM during our study period, and only 4-5% joined PFFS. Several explanations exist for why beneficiaries left "money on the table" and enrolled in TM instead of a PFFS plan. First, limited cognitive capacity may make it difficult for some beneficiaries to recognize that the TM option is dominated by PFFS (McWilliams et al. 2011). Second, status quo bias in health plan enrollment, observed in previous empirical work (Sinaiko, Afendulis, and Frank 2013), results in low rates of plan switching among incumbent Medicare beneficiaries already enrolled in TM. Third, the number of choices offered by MA insurers, together with the large number of dimensions to evaluate with each option, may create frictions in beneficiaries' decision making, leaving them in TM.

We explore the role of status quo bias and choice overload in decisions by Medicare beneficiaries to enroll in TM instead of MA. First, we compare the enrollment decisions of new 65-year-old Medicare beneficiaries to those of incumbent beneficiaries enrolled in TM in the prior year. The plan choice by a 65 year-old represents a "forced choice" situation, where an

[2] Supplemental coverage is an issue here. Those who purchase a Medigap plan to gain such coverage enjoy reduced cost sharing, but this must be weighed against an additional premium. We return to this question in the discussion section.

active choice is required. If status quo bias plays a role in the selection of the dominated plan, we should see higher rates of TM enrollment among the incumbents compared to the new beneficiaries. Second, we evaluate the impact of the number of plans offered in a beneficiary's county of residence on the choice of plan. If choice overload due to increasing numbers of plan choices affects beneficiary decision making, we should see enrollment patterns change as the number of plans offered increases.

The rest of this paper is organized as follows. Section 2 describes the previous literature on choice inconsistency, and provides some background on the Medicare Advantage program. Section 3 describes the data used in our study and presents our analytic approach. Section 4 presents our results, which indicate that status quo bias plays an important role in the choice of MA plans. Section 5 concludes.

2. Background

Consumers, Health Plans, and Choice Inconsistency

In standard consumer theory, expanding the number of choices makes it more likely that consumers will choose a product that matches their preferences. Greater choice promotes price and quality competition, leading to improved products at a given price (Bundorf, Levin, and Mahoney 2012; Salop 1979). Standard theory also recognizes that consumer search is costly. Rational consumers search individually until the costs of additional searching outweigh its expected benefits. More choice may also confer other benefits, such as a sense of greater autonomy and control.

A growing literature in psychology and economics questions whether and in what contexts consumers make decisions according to the rational choice model, which is a critical

assumption underlying the theory described above. One important idea is status quo bias, first identified by Samuelson and Zeckhauser (1988), which posits that certain choices are prone to frictions. While the standard economic model of consumer choice offers some explanations for this behavior, Samuelson and Zeckhauser conclude that the bias is more likely the result of psychological deviations from this model. Loss aversion as well as "anchoring" effects may play a role: the status quo option may win out over other options because it holds an asymmetric position in the list of choices. Psychological biases around commitment also provides a compelling explanation for the phenomenon, such as seeking to justify past choices by continuing to commit to them in the present, avoidance from the "decision regret" from outcomes that are the consequence of action versus inaction, cognitive dissonance (a desire for consistency in one's actions), and a deference to one's own past decisions as a guide to present and future choices.

The perspective that "more choice is better" has largely guided empirical work on health insurance plan choices, which focuses on how price and product attributes affect choice. While there are a number of studies on the price elasticity of health plan choice, search costs and switching costs have received less attention in this literature. Several of the papers that have considered this topic in private insurance settings find evidence consistent with status quo bias. Royalty and Solomon (1999) estimate models of price response in health plan choice under employer-sponsored insurance and find that consumers who are likely to face low switching costs (e.g., younger employees, new hires, and those with no chronic conditions) respond more to prices in making a health plan choice. Strombom, Buchmueller, and Feldstein (2002) and Handel (2013) also present evidence of status quo bias among enrollees with employer-sponsored health insurance coverage. Sinaiko and Hirth (2011) investigate a case of enrollees

faced with a clearly dominated plan choice. In this case, inertia was associated with at least a portion of these consumers choosing to remain in the dominated plan option.

Another branch of recent empirical work suggests that consumer choices in health insurance markets with large numbers of choices may result in errors. Using data from Switzerland, Frank and Lamiraud (2009) find an inverse relationship between the decision to revisit health care plan choice and the number of plan choices, suggesting that consumers may suffer from choice overload. A number of papers have focused on the quality of consumer enrollment decisions in the Medicare Part D program. Abaluck and Gruber (2011) find that Part D enrollees overemphasize the importance of plan premiums, and underemphasize expected out-of-pocket costs, when making their plan choices. Similarly, Heiss, McFadden, and Winter (2010) present evidence that Part D enrollees overemphasize their current drug utilization when making choices. Ketcham et al (2012) use longitudinal data to demonstrate that at least some Part D enrollees were able to improve their choices in their second year of the program. Abaluck and Gruber (2013) use more comprehensive data over a longer time period to reach the opposite conclusion, documenting significant foregone savings in the program and demonstrating that inertia in plan choices plays an important but not an exclusive role in this behavior among enrollees. These errors on the part of beneficiaries also have implications for the supply side; Ericson (2012) finds that Part D insurers are able to exploit this inertia in decision-making, raising prices on existing enrollees while introducing cheaper alternative plans for new enrollees. This suggests that decision-making errors could become costlier over time.

The literature on choice of health plan within the MA program has predominantly focused on the issue of favorable selection into MA from TM on the basis of health care needs (Riley and Zarabozo 2006). However, the question of whether beneficiaries make sub-optimal

choices has begun to be addressed in MA as well. McWilliams et al (2011) use data from the Health and Retirement Study to demonstrate choice overload among beneficiaries; the probability of MA enrollment was lower in markets with a larger number of MA plans available, relative to markets with a smaller number of MA plans. They also find that beneficiaries with impaired cognition were less likely to recognize and to be responsive to increases in MA plan benefit generosity. Sinaiko, Afendulis, and Frank (2013) investigate the MA enrollment decisions of Medicare beneficiaries from Miami-Dade County, and find evidence of status quo bias; beneficiaries new to Medicare are much more likely to enroll in an MA plan in that market (where MA penetration is quite high) than are incumbent beneficiaries.

The Medicare Advantage Program

Private plans began to play a role in the Medicare program with the passage of the Tax Equity and Fiscal Responsibility Act (TEFRA) in 1982. Starting in 1985, Medicare has contracted with insurers willing to offer care to enrollees on a prospective basis. The rationale for the program was the potential for private managed care plans to provide better, more coordinated care to enrollees than what is available in TM, and to realize cost savings for the federal government. Plans are required to provide benefits that are actuarially equivalent to the standard TM benefit package.

The number of private plan choices has varied over the history of the MA program, and during the second half of the 2000s, the time period under study here, Medicare beneficiaries faced the largest and richest set of options in the program's history. First, and most obviously, beneficiaries could have enrolled in TM. Because of holes in the basic Medicare benefit package, most of these enrollees also enroll in supplemental coverage (either through a former

employer, by purchasing a Medigap insurance product, or through eligibility for Medicaid). Many enrollees also purchase a separate prescription drug product through Part D of Medicare. Alternately, beneficiaries could have chosen an MA plan. Within MA they could have chosen an HMO or PPO plan that engaged in selective contracting, negotiating prices with a network of health care providers. They could have also opted for a PFFS plan, which, because of its ability to impose the TM fee schedule on providers, did not engage in selective contracting or maintain a provider network. All MA plans offered cost sharing terms that were more generous than TM alone. Figure 1 depicts the enrollment options faced by Medicare beneficiaries.

MA plan generosity is determined in part by rates of payment by Medicare to the plans. The MA payment rules for each county are set using a complicated formula that involves both administratively-set rates and lagged measures of fee-for-service spending in the county (Biles, Pozen, and Guterman 2009). These rules have led to a significant amount of variation in the level of MA benefit generosity across counties.[3]

Important to this analysis are the details around the so-called "floor" rates.[4] These floor rates were introduced to encourage MA options in highly concentrated markets (such as those in rural areas) where insurers found it difficult to bargain with providers. Insurers embraced PFFS plans for these markets. While beneficiaries in PFFS plans across the US faced no restrictions on provider choices, in floor counties the PFFS benefits were, due to competitive pressures among insurers, certainly more generous than those provide through TM as a result of the

[3] Some counties' benchmark payment rates were based on a five-year average of the per capita spending on TM beneficiaries, measured at several different points in time. Other counties' rates were set to a national minimum rate, and still others' to either an urban or rural "floor" rate. The rate that prevailed in any county was the highest of all of these rates.

[4] The Balanced Budget Act of 1997 (BBA) first introduced the idea of an MA floor rate, and the subsequent Budget Improvement and Protection Act of 2000 (BIPA) created separate floor rates for counties in urban and rural areas. Urban floor counties were defined as those that were part of metropolitan statistical areas with 250,000 or more residents.

legislatively set high MA reimbursement rates. To better isolate choice environments where the PFFS option clearly dominated TM, we focus our analyses on beneficiaries residing in these floor counties.

With the passage of MIPPA in 2008 and its imposition of network requirements on PFFS plans in 2011, insurers withdrew many of their PFFS products from the market. While PFFS enrollment currently constitutes a relatively small percentage of the market, the significant role these plans played in the MA program offer an opportunity to evaluate the role that dominated choices play in markets for health insurance.

3. Data and Methods

Data

The data used in this analysis come from several sources. First, we use a 100% sample of Medicare enrollment data from the Centers for Medicare and Medicaid Services (CMS), for the years 2007-2010. This file contains information on the age, race (black/non-black), sex, dual-eligible status, original reason for Medicare entitlement, and state and county of residence for every beneficiary. We separate this file into two samples of beneficiary-year observations: new entrants to Medicare aged 65 as of January of each calendar year, and incumbent beneficiaries aged 66 and older in January of each year. We do not study Medicare beneficiaries under the age of 65, whose MA enrollment rates are generally much lower than those of beneficiaries who qualify for the program due to old age, and many of whom (e.g., the disabled) likely have different set of considerations in plan choice than do old-age beneficiaries.

Second, for those beneficiaries who enrolled in an MA plan, we use the CMS Enrollment Database to identify their plan type (HMO, PPO, PFFS, other). Third, we employ inpatient

hospital, outpatient hospital and physician/supplier claims for all TM enrollees, to generate 70 risk adjustment variables used by CMS in their "Hierarchical Condition Categories" model, which is used to adjust capitation payments to MA plans (Centers for Medicare & Medicare Services 2007a). Because of data limitations, these claims are only available for a 20% random sample of beneficiaries who have been enrolled in TM for at least one year (i.e., beneficiaries aged 66 and older.) We analyze each beneficiary's claims from the prior calendar year to code these variables. Fourth, we employ several publicly available data files from CMS: county-year data on MA plan offerings (Centers for Medicare & Medicare Services 2007-2010a), county-year MA benchmark payment rates (Centers for Medicare & Medicare Services 2007-2010d), county-year average TM spending and risk score data (Centers for Medicare & Medicare Services 2007b, 2008-2010), county-year average MA capitation payment and risk score data (Centers for Medicare & Medicare Services 2007-2010c), and plan-county-year Medicare Advantage enrollment counts (Centers for Medicare & Medicare Services 2007-2010b).

Finally, we use estimates obtained from CMS of the out of pocket cost (OOPC) of each MA plan option, as well as the OOPC associated with TM and Medigap plans. These OOPC estimates are calculated each year by CMS, and are presented to prospective MA enrollees shopping for coverage on the "Medicare Options Compare" website. The estimates are calculated based on a two-year rolling sample of utilization records from TM enrollees in the Medicare Current Beneficiary Survey (MCBS), which CMS then applies to the benefit structure of each MA plan (along with TM and Medigap plans) to come up with an OOPC estimate for each plan. Separate estimates are prepared for five health categories (using the self-reported health item from the MCBS), and six age categories (less than 65, 65-69, 70-74, 75-79, 80-84, 85-plus).

To evaluate the generosity of MA plan options at the county-level, we summarize these health-age-plan-level OOPC estimates in the following way. We first take a weighted average across the health status groups to collapse the estimates down to age groups for each plan, using the percentage of MCBS enrollees from that year's survey as the weights. We then use the publicly available plan-county-year enrollment data described above to generate a county-weighted average OOPC estimate for each age group, county, and year.[5] We perform a similar set of calculations for TM, assuming that enrollees in this option also purchase one of the common Medigap plans, Plan C, to pay a portion of the expenses that the program does not cover. Finally, we subtract the MA OOPC estimate from the TM-plus-Medigap OOPC estimate to produce a measure of the benefit of joining MA in each county.

We note a few limitations of the OOPC estimates. While others have relied on these OOPC estimates (Dunn 2010; McWilliams et al. 2011), they imperfectly capture MA benefit generosity. They are estimated using a relatively small sample of TM beneficiaries who appear in the MCBS, and do not capture the risk distribution realized by each plan. More importantly, the estimates do not capture any changes in health care demand related to the plan's benefit structure (i.e., moral hazard). And our aggregation of these plan, age, and health status-level estimates to the county level to fit with our analysis introduces additional measurement error.

Study Population

From the set of beneficiaries aged 65 and older that were enrolled in Medicare as of January of each calendar year, we select the sample of beneficiaries residing in counties where

[5] We use the July file from each calendar year. Since CMS masks enrollment for any combination of plan and county with fewer than 11 enrollees, we assume that enrollment for those cases is zero.

the MA benchmark payment rate is set to either the urban or rural "floor" amount for all four years under study. We exclude MA enrollees in non-HMO/PPO/PFFS plans (e.g., cost-based plans), which are not marketed in any significant way to beneficiaries and have small enrollment rates. We exclude enrollees of Special Needs Plans, which are restricted to those with chronic conditions, those who are institutionalized, or those dually eligible for Medicaid. Some employers offer MA plans exclusively to their retirees, these enrollees are excluded from the study population as well. Finally, we drop cases from counties where enrollees lack a choice of at least one HMO/PPO plan and at least one PFFS plan.

Since Medicare beneficiaries also enrolled in Medicaid have little to no cost sharing when enrolled in TM, we exclude these dual-eligible beneficiaries from both samples. From the age-66-plus sample, we drop cases not enrolled in TM in the prior year: we are only interested in the MA decision-making of beneficiaries not currently in the program. We also drop those with any nursing home utilization in the prior year, and those who reside in a county without at least one MA plan option.

After these restrictions, our 100% age-65 and age-66-plus samples contain 4.3M and 50.3M beneficiary-year observations, respectively. Our 20% sample of incumbent beneficiaries for whom we have prior medical claims data contains 10.1M observations.

Methods

We estimate several multinomial logit models to examine the choice between three broad enrollment options: TM, PFFS and managed MA plans (HMO or PPO). We include the following independent variables. First, to capture the complexity of the plan choice environment, we count the number of MA plan choices in the county, using three spline terms:

the overall plan count, the number of plans above 15 (the 25th percentile of the plan count variable) and the number of plans above 44 (the 75th percentile of the plan count variable). This is a piecewise linear representation of the impact of plan count on beneficiaries' enrollment decisions.[6] This semi-parametric approach allows us to capture the choice environment in a more flexible way than other approaches, such as a single linear variable or several dichotomous variables. Second, we include indicator terms for five age categories (in regressions that include the age-66-plus sample only): 66-69, 70-74, 75-79, 80-84, and 85-plus. Third, we use the OOPC measure described above. Larger values of this measure indicate that MA is more generous in that county and year. Fourth, we add indicators for the four years in our sample. Fifth, we add sex and race (black/non-black) indicators. Finally, we include a series of 70 clinical condition indicators, coded using ICD-9 diagnosis codes from the inpatient hospital, outpatient hospital and physician supplier claims categories (in regressions using the age-66-plus 20% sample only).

To test for status quo bias, we estimate two regressions, one using the new entrant sample and one using the sample of incumbent beneficiaries. We perform sensitivity analyses using the 20% sample, which allows us to control for the health status of incumbent beneficiaries. For the age 66-plus sample, we also run a sensitivity analysis that includes interactions between the four choice environment variables (the three plan count terms and the OOPC term) and the age group variables. We cluster standard errors at the county level.

Using our OOPC measure, we also perform calculations to quantify a lower bound for the "money left on the table" by enrollees who choose TM when that option is dominated in floor counties. We multiply the number of enrollees in TM by the difference in the expected OOPC between TM and PFFS, which is the least restrictive MA option, separately for each age group,

[6] Due to the exclusions described above, the county-level plan count includes non-employer, non-SNP plans of three plan types: HMO, PPO (both local and "regional" variants), and PFFS.

county, and year. We then divide this amount by the number of Medicare beneficiaries, and summarize this estimate across age groups, counties, and in total for our sample.

4. Results

Table 1 presents descriptive statistics comparing the generosity of MA payment in rural floor, urban floor and non-floor counties in 2010, the latest year included in our analysis. The rural and urban floor benchmark payment rates of $740.16 and $818.04, respectively, are both less than the average payment rate in non-floor counties, $895.63. The table also shows that the risk-standardized, average cost rate for TM is lower in the floor counties. This translates into average payment generosity (the benchmark rate minus the TM cost rate) amounts of $86.76 and $138.09 in rural and urban floor counties, respectively. While the MA OOPC rate is higher in both types of floor counties than in non-floor counties, the opposite is the case for the TM OOPC rate. The average MA rebate (the portion of the difference between the benchmark and the plan bid that CMS directs insurers to spend on additional benefits for enrollees) is also smaller in floor counties. There are small differences in average risk scores across the groups of counties: for both MA and TM, enrollees in rural floor counties are the healthiest, enrollees in non-floor counties the least healthy. MA enrollees are healthier on average than TM enrollees.

Figures 2a and 2b examine the choice overload issue by illustrating the relationship between the number of plans and enrollment in PFFS and HMO/PPO plans, using unadjusted data from our two samples. Figure 2a shows that among new entrants into Medicare, rates of enrollment increase up until the number of MA plans offered in a county reaches approximately 60, with HMO enrollment continuing to increase and PFFS enrollment decreasing for higher plan count values. For incumbent beneficiaries, (Figure 2b) enrollment rates increase until the

number of plans offered in a county reaches 20, then it levels off for both plan types. Among new entrants into Medicare, the overall rates of HMO/PPO and PFFS enrollment are 9.9% and 5.2%, respectively. In contrast, rates of enrollment into MA from TM among beneficiaries age 66+ are much lower: 1.8% and 2.1% for HMO and PFFS enrollment, respectively.

The "money left on the table" by the many TM beneficiaries in floor counties is significant, but varies across counties. As described in the previous section, for this calculation we multiply the difference between the TM and MA OOPC by the number of TM enrollees in the county, and then divide that amount by the number of Medicare beneficiaries in the county. Across counties, there is wide variation in the money foregone: \$45 for the 5th percentile county, \$222 for the 95th percentile county, and \$110 for the median. Summarizing across counties by age group yields smaller differences: the estimates for ages 66-69 through 85-plus are in the range \$102-\$105, while the estimate for non-incumbent beneficiaries is \$92. The forgone savings is at a minimum in counties with five or fewer plans, \$43 for non-incumbents and \$21 for incumbents (Figure 3). The measure increases significantly as the plan count reaches 10, and then more slowly thereafter.

Tables 2a and 2b present results from our multinomial logit regressions. In both samples, and for both pairwise comparisons (HMO/PPO and PFFS, with TM as the reference category), the coefficient estimates for each of the three plan count variables are statistically significant at the 0.01 level. Because it is difficult to summarize all of these coefficient estimates, in figures 4a and 4b we illustrate how the regression-adjusted probability of each choice changes with the number of MA plans offered in the county.[7] Figure 4a shows that MA enrollment increases through the first plan count cut point of 15 plans, with higher enrollment in PFFS plans.

[7] We calculate the predicted probabilities in these by setting all variables (except the plan count terms) to their mean values.

Between the first and second cut points, rates of PFFS enrollment are flat, in contrast to HMO/PPO enrollment, which continues to climb. Rates of PFFS enrollment decline after the second cut point, while HMO/PPO enrollment increases at a similar rate. Figure 4b depicts a similar relationship for the incumbent beneficiary sample, though the overall rate of MA enrollment is much lower than for the sample of new entrants.

The regression results offer two other important insights. First, for both samples and both pairwise comparisons, the OOPC term is of the opposite sign than we expect, and is of limited substantive and statistical significance. As we discussed in section 3, this variable contains significant measurement error, so these coefficient estimates may be biased towards zero. Second, among incumbent beneficiaries there is a monotonic and statistically significant decline in both HMO/PPO and PFFS enrollment as a beneficiary's age increases.

Sensitivity analyses on the age 66-plus sample that add interactions between the plan count terms and age group indicators, the same basic results hold: (1) MA enrollment declines with age, and (2) MA enrollment increases up to the 25th percentile of the plan count and then levels off. Additional regression runs on our 20% sample of incumbent beneficiaries demonstrate that controlling for beneficiary health status does not change our main results.[8]

5. Discussion

The relatively low rates of MA enrollment among Medicare beneficiaries, even among those residing in floor counties, remains a puzzle. Despite the fact that during our study period PFFS plans in particular were able to offer a combination of enhanced benefits and no restrictions on provider choice, less than a quarter of Medicare beneficiaries were enrolled in

[8] The results from these sensitivity analyses are available in an appendix.

MA. Our results also indicate that neither group of beneficiaries took their anticipated out-of-pocket costs into account when choosing between TM and either PFFS or HMO/PPO plans. This may reflect measurement error in our measure of generosity, although it is consistent with other work on health insurance plan choice (Abaluck and Gruber 2011; Heiss et al. 2010).

Over 2007-2010, the rate of MA enrollment was significantly higher among new Medicare beneficiaries than among incumbents, suggesting that enrollees who chose TM before this period were unlikely to revisit their choice. This finding suggests that status quo bias plays an important role in the selection of TM over PFFS or other MA options.

Our results also illustrate the importance of the choice environment that is in place when enrollees first enter the Medicare program. Extrapolating from our findings, we see that trends in MA penetration depend at least in part on inertia. When MA plans and benefits become less attractive to beneficiaries, a fall in aggregate MA penetration may take years to observe as it takes time for the ramifications of new entrants failing to take-up MA to be felt.

A potential concern with this analysis is that our results depend on the assumption that PFFS plans dominate TM. We make this claim because MA plans are required to offer a benefit package that is actuarially equivalent to traditional Medicare's benefit package. Moreover, focusing on inpatient hospital care as an example, every single PFFS plan from 2007 offered more generous benefits than TM. For this domain of care at least, this demonstrates that PFFS dominates TM. However, the benefit design of a typical MA plan covers a large number of domains, and we are unable to compare every characteristic of MA plans to TM.

Another concern is that beneficiaries enrolled in TM have the opportunity to gain first-dollar coverage by purchasing a Medigap policy, which is not an option for MA enrollees. Ideally, we would control for supplemental coverage among TM enrollees in our sample, but we

do not have information on this coverage in the micro-level enrollment file we employ in our analyses. Instead, we have attempted to capture the attractiveness of this option in our OOPC estimates for TM enrollment: those estimates reflect the expenses that enrollees could expect to incur when enrolled in TM and Medigap plan "C." Some beneficiaries may prefer the certainty of a monthly Medigap premium (in combination with TM) to the uncertainty of out-of-pocket medical expenses. But many MA plans offer similar types of coverage to Medigap plans, even at the front end, and at little or no additional premium. Indeed, one can view the inflated payments to plans in the MA program as subsidies that partially flow through to beneficiaries, covering medical expenses that they would otherwise need to insure against by purchasing supplemental coverage.

A related and more nuanced concern involves beneficiaries' perceptions of plan stability for MA plans and insurers compared to TM. Perhaps beneficiaries worry that MA plans may be canceled, disrupting their care, and forcing them to transition plans again in the near future. While this is a concern consumers might justifiably have about life insurance or long-term care insurers (where premiums in the current period insure against risks that occur potentially far in the future), this is unlikely to be a serious issue for MA. The enrollment contract is only one year in length, and patients can move back to TM or can select an alternative MA contract with little cost to them.

Another issue is that our measures of plan availability and generosity may be endogenous. We assume that the county-level variation in each of these measures is driven by exogenous factors (e.g., the payment rules for MA), and not by beneficiary demand. Other analyses of MA program effects have attempted to deal with this issue by exploiting plausibly exogenous variation in MA payment rates across counties and time (Song, Landrum, and

Chernew 2013). This approach does not work for our analysis: since we focus on urban and rural floor counties, we have only two unique payment rate amounts in each year. We instead explored instrumenting for these two measures.[9] The results (not reported) have the same sign as our non-IV results, but the coefficients for the plan count and OOPC terms are imprecisely estimated.

It is not clear what drives the inertia we observe. One possibility is that a beneficiary's initial entry involves active participation in the plan enrollment process: these individuals have to fill out forms and perhaps make in-person trips to their local security office, and also contemplate the value of Medigap, stand-alone Part D, and MA plans. Though TM occupies a preferred or default position in Medicare enrollment materials, simply being made aware in such materials (or by an insurance agent) of MA plans may foster active decision-making. Conversely, incumbent beneficiaries must overcome switching costs to move from TM to MA, which include reviewing provider networks for each plan and learning a new set of cost sharing rules. Incumbent beneficiaries who take no action are re-enrolled in TM. The decision to remain in TM is thus much more passive when compared with the decisions required of new entrants to the program.

Inertia in beneficiary plan choices has implications for the functioning of the MA program. For example, the network requirements that were a part of the MIPPA caused many PFFS plans to exit MA, and many enrollees in those plans were "defaulted" back into TM. The

[9] One of our instruments is the commercial HMO penetration rate in the county, and the other is a term indicating whether the county was an urban or rural floor county. Urban and rural floor MA payment rates change discontinuously around a threshold value: rural floor counties are part of Metropolitan Statistical Areas (MSAs) with fewer than 250,000 inhabitants, while urban floor counties are part of MSAs with a population of 250,000 or more. We constructed a sample of beneficiaries residing in MSAs with populations between 100,000 and 400,000. We also included a continuous measure of population in both the first and second stage regressions, to better isolate the effects of the discontinuity term.

status quo bias documented here suggests that the impact of this change would be that many of those beneficiaries would remain in TM, even if their optimal choice was with another MA plan offered in their county. The evidence we have presented on inertia also has implications for the dynamics of MA plan offerings. MA insurers may respond to inertia in this market by reducing the benefit generosity of existing plans, and introduce new ones to entice non-incumbent Medicare beneficiaries in a manner similar to insurers offering stand-alone Part D plans, as documented by Ericson (2012). Future work should explore this question.

We did not find much evidence in support of choice overload in the MA market; MA enrollment did not decline with an increase in the number of plans, although among incumbent beneficiaries it failed to increase. A strict interpretation of the rational decision-making model would predict that enrollment rates would rise with each additional plan option, rather than the leveling off that we observe. But it may simply be the case that there are diminishing returns to additional choices, even for rational consumers.

Reducing the number of plans would not adversely affect enrollment rates (especially among incumbent beneficiaries), and if properly structured could generate additional benefits for enrollees or taxpayers. In their review of the behavioral economics literature on health care choices, Liebman and Zeckhauser (2008) propose that a public mediator play such a role in limiting plan choice, although they recognize that there may be political constraints. In fact, CMS recently issued a proposed rule that would reduce the number of plans in both the Part D and MA programs (Centers for Medicare & Medicare Services 2014). However, as Abaluck and Gruber (2011) make clear, a random selection of plans is not sufficient to improve consumer welfare. What is necessary is for policymakers or regulators to restrict choice to plans among an efficient frontier. For example, if CMS selected a small number of plans on the basis of

competitive plan bids, government payments could be reduced without adversely impacting beneficiary welfare.

Another reform idea would be to optimize the informational resources available to consumers. The Affordable Care Act explicitly provided a role for health insurance "Navigators" to help enrollees on the health insurance exchanges find coverage (Department of Health & Human Services 2013). A similar program could help MA enrollees optimize their enrollment decisions, and in particular assist incumbent beneficiaries overcome inertia in plan choice. One idea would be to have program representatives engage beneficiaries on an annual basis to reconsider the tradeoffs between MA and TM. Doing so could improve the welfare of many beneficiaries who have foregone the enhanced benefits of MA.

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Figure 1: Medicare Enrollment Choice Structure

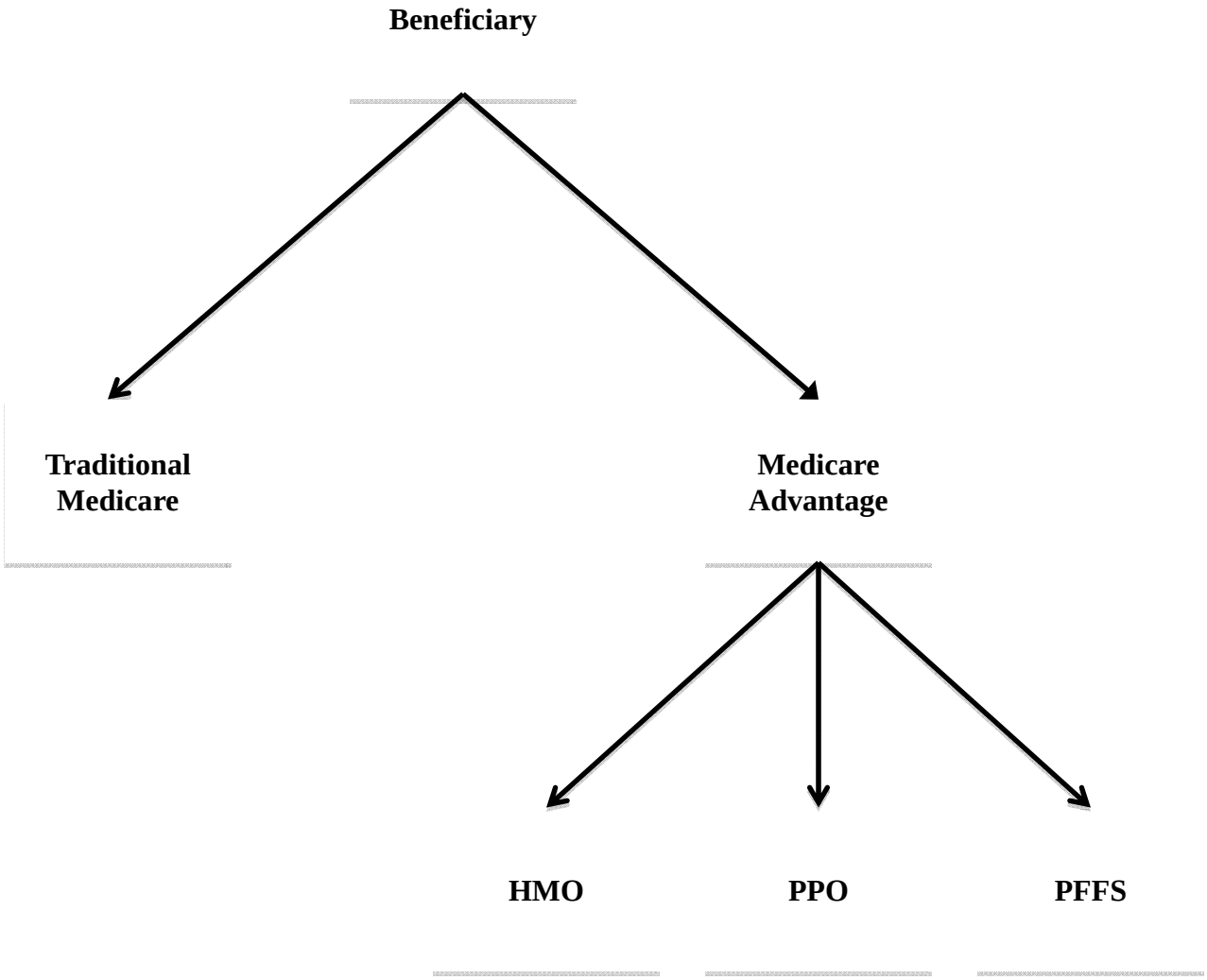

Figure 2a: MA Enrollment and Plan Choices, Age 65 (Unadjusted)

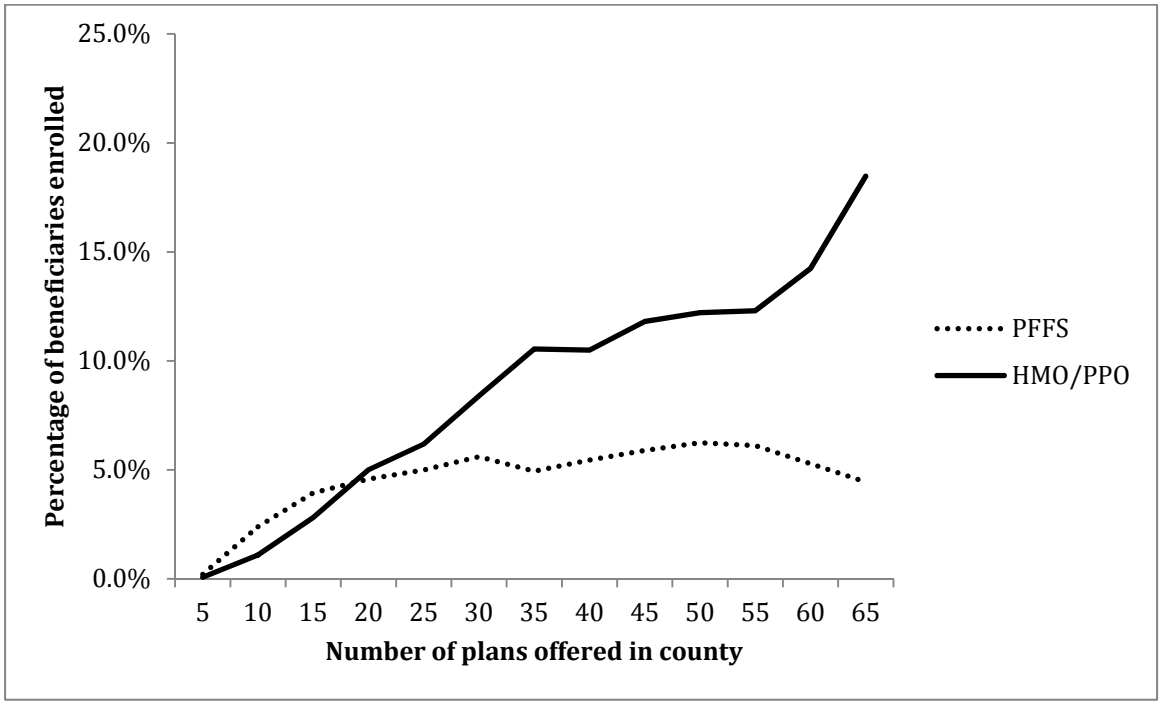

Figure 2b: MA Enrollment and Plan Choices, Age 66-plus (Unadjusted)

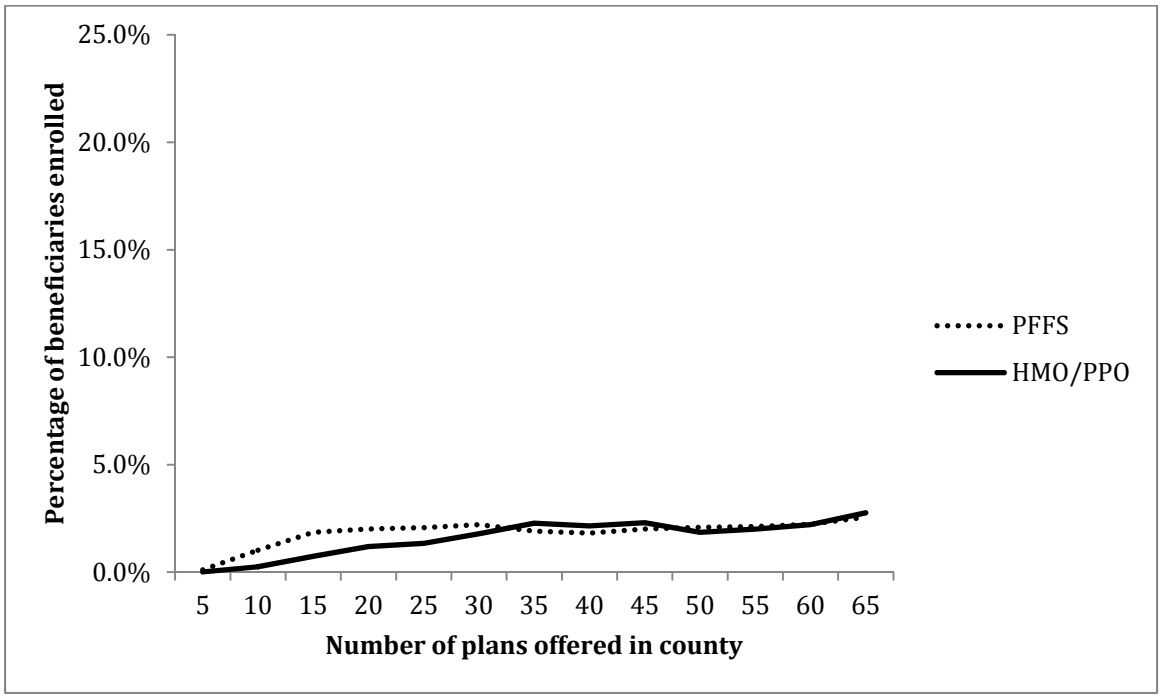

Figure 3: Difference in TM and MA OOPC, by Number of Plans in County

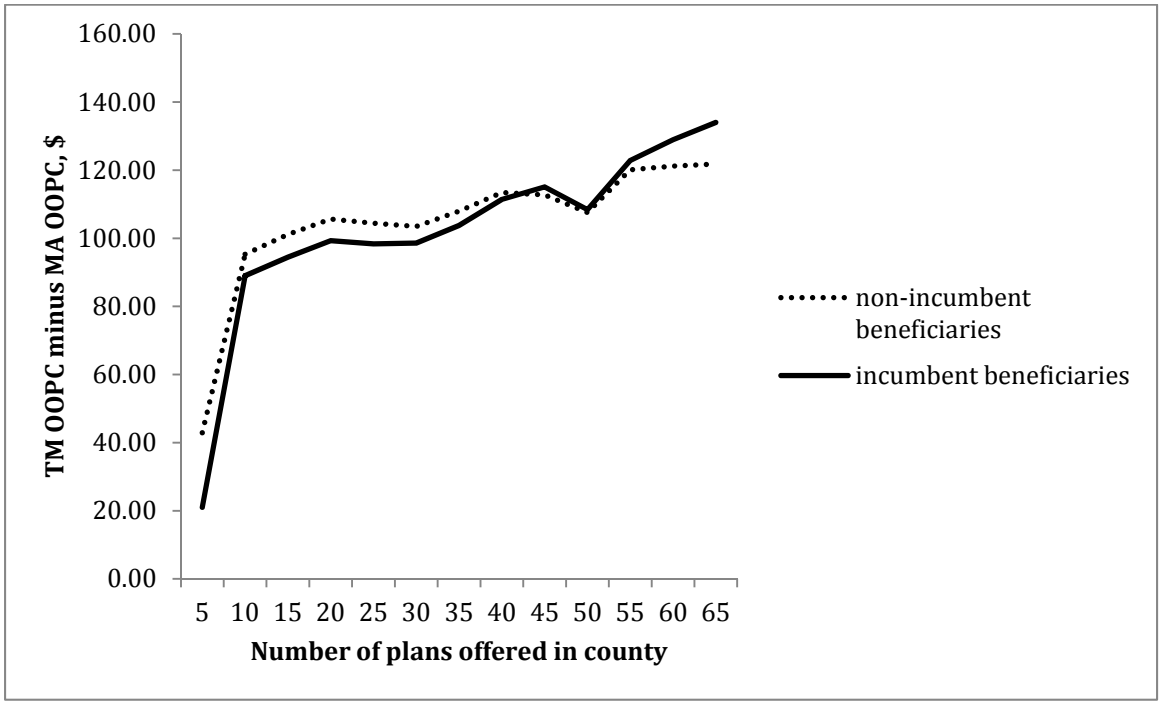

Figure 4a: MA Enrollment and Plan Choices, Age 65 (Regression Adjusted)

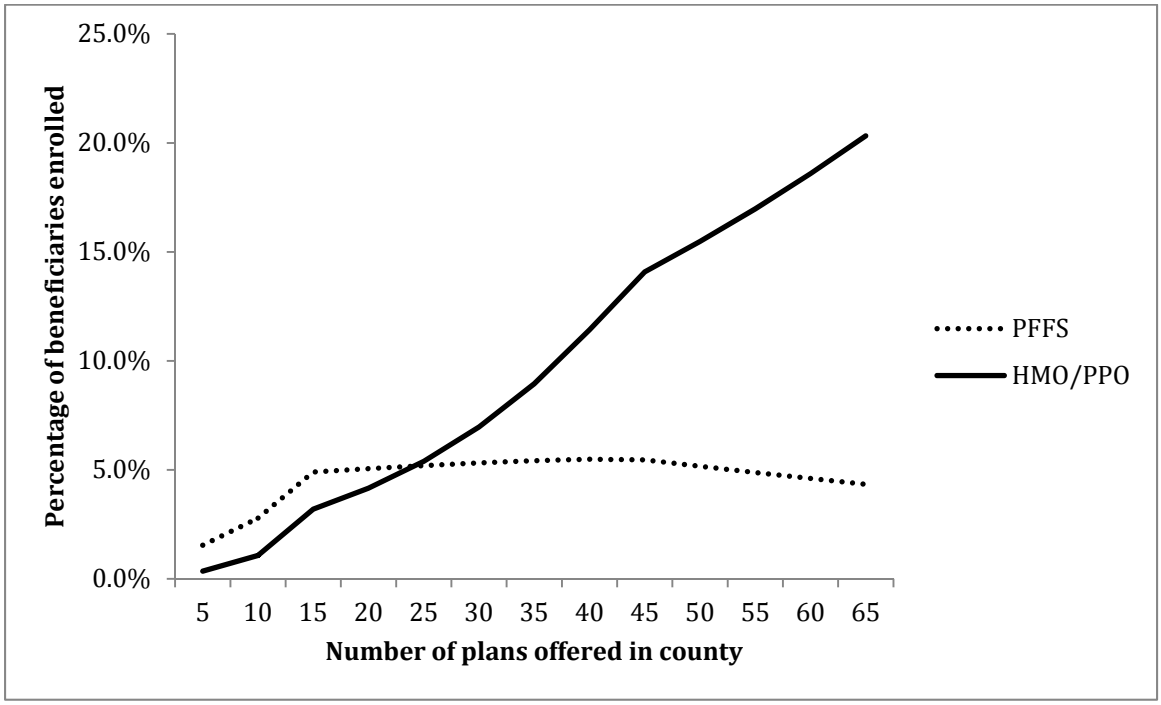

Figure 4b: MA Enrollment and Plan Choices, Age 66-plus (Regression Adjusted)

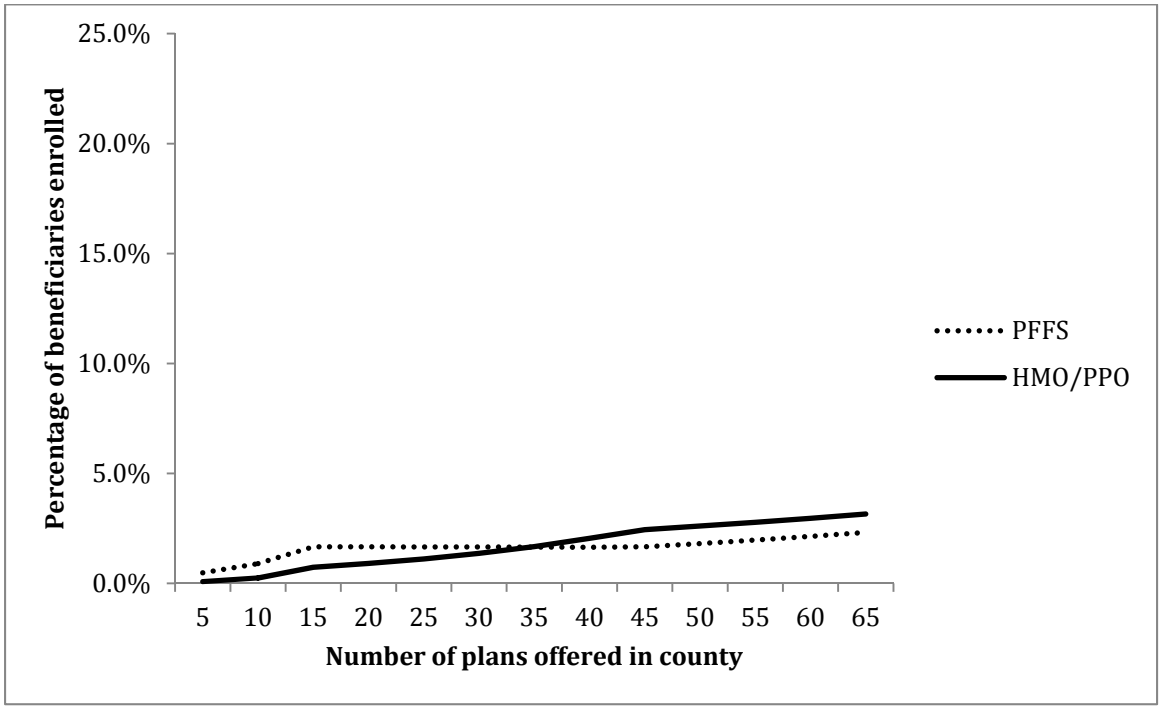

Table 1: Characteristics of Rural Floor, Urban Floor, and Non-Floor Counties, 2010

	Rural Floor Counties	Urban Floor Counties	Non-Floor Counties
Benchmark Payment Rate	740.16	818.04	895.63
TM Average Cost	653.40	679.95	770.14
Benchmark-TM Cost	86.76	138.09	125.49
TM OOPC	454.14	460.72	473.98
MA OOPC	323.50	326.92	307.60
TM OOPC - MA OOPC	130.65	133.79	166.38
MA Rebate	36.44	56.91	72.20
Risk Score, TM	0.95	0.98	1.03
Risk Score, MA	0.86	0.92	0.96
Number of Counties	1,366	611	1,133
Number of beneficiaries	4,391,792	9,060,876	9,679,554

Table 2a: Age 65 Regression Results

	HMO_PPO	PFFS
ma_plans	0.227***	0.122***
	(0.0386)	(0.0189)
spline16	-0.172***	-0.113***
	(0.0383)	(0.0198)
spline45	-0.0334***	-0.0167***
	(0.00439)	(0.00566)
diff_oopc	-0.000881	-0.00120*
	(0.000585)	(0.000643)
y2008	-0.693***	0.0679
	(0.0770)	(0.0672)
y2009	-0.396***	0.0439
	(0.0588)	(0.0492)
y2010	0.511***	-0.424***
	(0.0612)	(0.0408)
black	-0.332***	0.126***
	(0.0545)	(0.0446)
male	-0.275***	-0.237***
	(0.00738)	(0.00594)
Constant	-6.359***	-4.444***
	(0.586)	(0.273)
Observations	4,318,089	

Reference category is TM
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2b: Age 66-plus Regression Results

	HMO_PPO	PFFS
ma_plans	0.220***	0.125***
	(0.0446)	(0.0195)
spline16	-0.179***	-0.125***
	(0.0452)	(0.0203)
spline45	-0.0280***	0.0172***
	(0.00462)	(0.00549)
diff_oopc	-2.46e-05	-0.00120**
	(0.000390)	(0.000493)
a7074	-0.332***	-0.0634***
	(0.0137)	(0.00639)
a7579	-0.583***	-0.154***
	(0.0209)	(0.0116)
a8084	-0.802***	-0.276***
	(0.0230)	(0.0198)
a85plus	-1.049***	-0.500***
	(0.0239)	(0.0268)
y2008	-0.870***	-0.246***
	(0.0626)	(0.0755)
y2009	-0.549***	-0.826***
	(0.0512)	(0.0540)
y2010	0.341***	-1.594***
	(0.0831)	(0.0429)
black	0.199***	0.581***
	(0.0490)	(0.0373)
male	0.0128**	-0.0172**
	(0.00646)	(0.00687)
Constant	-7.459***	-5.026***
	(0.658)	(0.279)
Observations	50,287,750	

Reference category is TM
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix

Appendix Table A.1: Age 66-Plus Regression Results with Age Group Interactions

	HMO_PPO	PFFS
ma_plans	0.220***	0.125***
	(0.0353)	(0.0196)
spline16	-0.176***	-0.125***
	(0.0357)	(0.0205)
spline45	-0.0270***	0.00990*
	(0.00407)	(0.00559)
diff_oopc	-8.00e-05	-0.00133**
	(0.000434)	(0.000592)
a7074	-0.278	-0.0800
	(0.340)	(0.0675)
a7579	-0.665	-0.287***
	(0.479)	(0.0963)
a8084	-0.563	-0.307**
	(0.786)	(0.126)
a85plus	-0.658	-0.771***
	(0.944)	(0.166)
a7074_plans	0.00170	0.00117
	(0.0224)	(0.00472)
a7074_spl16	-0.00514	-0.00156
	(0.0224)	(0.00496)
a7074_spl45	3.08e-05	0.00662***
	(0.00223)	(0.00143)
a7074_oopc	5.06e-05	-0.000184
	(0.000148)	(0.000120)
a7579_plans	0.0140	0.00614
	(0.0317)	(0.00688)
a7579_spl16	-0.0197	-0.00548
	(0.0318)	(0.00736)
a7579_spl45	-4.00e-05	0.00980***
	(0.00307)	(0.00288)
a7579_oopc	0.000122	-0.000117
	(0.000218)	(0.000177)
a8084_plans	-0.00962	-0.00740
	(0.0521)	(0.00936)
a8084_spl16	0.00525	0.0105
	(0.0521)	(0.0103)
a8084_spl45	-0.00448	0.00961**
	(0.00289)	(0.00466)

	HMO_PPO	PFFS
a8084_oopc	0.000291	0.000293
	(0.000228)	(0.000231)
a85plus_plans	-0.0173	0.00450
	(0.0627)	(0.0125)
a85plus_spl16	0.0122	-0.00127
	(0.0626)	(0.0137)
a85plus_spl45	-0.00530*	0.0119**
	(0.00299)	(0.00557)
a85plus_oopc	0.000156	0.000729***
	(0.000222)	(0.000272)
y2008	-0.872***	-0.241***
	(0.0624)	(0.0764)
y2009	-0.548***	-0.826***
	(0.0510)	(0.0539)
y2010	0.341***	-1.589***
	(0.0830)	(0.0434)
black	0.199***	0.581***
	(0.0490)	(0.0373)
male	0.0125*	-0.0171**
	(0.00644)	(0.00687)
Constant	-7.519***	-4.961***
	(0.524)	(0.281)
Observations	50,287,750	50,287,750

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table A.2: Age 66-Plus Regression Results with Age Group Interactions

	HMO_PPO	PFFS
ma_plans	0.213***	0.122***
	(0.0428)	(0.0198)
spline16	-0.171***	-0.122***
	(0.0434)	(0.0205)
spline45	-0.0274***	0.0175***
	(0.00469)	(0.00539)
diff_oopc	9.84e-05	-0.00111**
	(0.000408)	(0.000491)
a7074	-0.271***	-0.0181**
	(0.0131)	(0.00814)
a7579	-0.460***	-0.0660***
	(0.0193)	(0.0121)
a8084	-0.627***	-0.151***
	(0.0191)	(0.0179)
a85plus	-0.859***	-0.363***
	(0.0213)	(0.0245)
y2008	-0.887***	-0.256***
	(0.0644)	(0.0744)
y2009	-0.555***	-0.832***
	(0.0523)	(0.0543)
y2010	0.337***	-1.587***
	(0.0844)	(0.0437)
black	0.215***	0.566***
	(0.0489)	(0.0385)
male	0.0421***	0.00866
	(0.00829)	(0.00888)
cc1	-0.340*	-0.278*
	(0.190)	(0.165)
cc2	-0.0579	-0.0199
	(0.0379)	(0.0334)
cc5	-0.247***	-0.172**
	(0.0804)	(0.0684)
cc7	-0.150***	-0.135***
	(0.0327)	(0.0288)
cc8	-0.262***	-0.183***
	(0.0317)	(0.0289)
cc9	-0.263***	-0.288***
	(0.0244)	(0.0208)

	HMO_PPO	PFFS
cc10	-0.327***	-0.285***
	(0.0195)	(0.0116)
cc15	0.00997	-0.0455*
	(0.0244)	(0.0248)
cc16	0.0888***	0.0296*
	(0.0213)	(0.0172)
cc17	0.0426	-0.116*
	(0.0633)	(0.0680)
cc18	-0.0885***	-0.0793***
	(0.0268)	(0.0234)
cc19	-0.153***	-0.0228**
	(0.0135)	(0.0106)
cc21	0.0790**	-0.0190
	(0.0355)	(0.0359)
cc25	0.0136	-0.187**
	(0.0656)	(0.0755)
cc26	-0.185***	-0.0794
	(0.0565)	(0.0549)
cc27	-0.361***	-0.350***
	(0.0838)	(0.0725)
cc31	-0.138***	-0.126***
	(0.0309)	(0.0245)
cc32	-0.245***	-0.206***
	(0.0321)	(0.0285)
cc33	-0.305***	-0.263***
	(0.0386)	(0.0368)
cc37	-0.113***	-0.175***
	(0.0427)	(0.0331)
cc38	-0.295***	-0.255***
	(0.0199)	(0.0176)
cc44	-0.235***	-0.153***
	(0.0543)	(0.0456)
cc45	-0.270***	-0.326***
	(0.0545)	(0.0468)
cc51	-0.0684	-0.0212
	(0.0580)	(0.0534)
cc52	-0.116**	-0.248***
	(0.0467)	(0.0522)
cc54	-0.238**	-0.169**
	(0.0935)	(0.0833)

	HMO_PPO	PFFS
cc55	-0.187***	-0.235***
	(0.0218)	(0.0230)
cc67	-0.228*	-0.0814
	(0.119)	(0.0981)
cc68	-0.168	-0.0447
	(0.149)	(0.136)
cc69	-0.334***	-0.201***
	(0.0483)	(0.0417)
cc70	0.0898	-0.515**
	(0.193)	(0.236)
cc71	-0.235***	-0.219***
	(0.0174)	(0.0177)
cc72	-0.177**	-0.209***
	(0.0713)	(0.0711)
cc73	-0.237***	-0.195***
	(0.0279)	(0.0254)
cc74	-0.0989***	-0.116***
	(0.0284)	(0.0235)
cc75	0.0145	-0.100
	(0.0736)	(0.0787)
cc77	0.188*	0.0912
	(0.0996)	(0.0969)
cc78	-0.171	0.0514
	(0.160)	(0.126)
cc79	-0.0874***	-0.00912
	(0.0215)	(0.0182)
cc80	-0.0961***	-0.0669***
	(0.0142)	(0.0108)
cc81	0.103***	0.0571*
	(0.0361)	(0.0302)
cc82	-0.0311	-0.0385*
	(0.0238)	(0.0221)
cc83	-0.142***	-0.177***
	(0.0233)	(0.0166)
cc92	-0.216***	-0.169***
	(0.0136)	(0.00927)
cc95	0.0165	-0.000913
	(0.0537)	(0.0500)
cc96	-0.100***	-0.113***
	(0.0196)	(0.0176)

	HMO_PPO	PFFS
cc100	-0.0725*	-0.104***
	(0.0408)	(0.0348)
cc101	-0.0222	-0.101
	(0.0817)	(0.0695)
cc104	-0.0146	-0.0323
	(0.0229)	(0.0214)
cc105	-0.232***	-0.211***
	(0.0157)	(0.0131)
cc107	-0.192	-0.176
	(0.197)	(0.178)
cc108	-0.161***	-0.126***
	(0.0167)	(0.0122)
cc111	0.0477	-0.110**
	(0.0481)	(0.0439)
cc112	-0.102**	-0.135***
	(0.0501)	(0.0480)
cc119	-0.213***	-0.128***
	(0.0422)	(0.0343)
cc130	-0.739***	-0.562***
	(0.118)	(0.0909)
cc131	-0.108***	-0.0789***
	(0.0153)	(0.0160)
cc132	-0.00348	-0.0688*
	(0.0440)	(0.0417)
cc148	-0.0451	-0.0654*
	(0.0476)	(0.0397)
cc149	-0.137***	-0.111***
	(0.0239)	(0.0228)
cc150	-1.158	-0.0135
	(1.009)	(0.510)
cc154	0.188	-0.611*
	(0.262)	(0.351)
cc155	-0.160***	-0.135***
	(0.0487)	(0.0478)
cc157	-0.245***	-0.231***
	(0.0278)	(0.0258)
cc158	-0.249***	-0.126***
	(0.0315)	(0.0245)
cc161	0.129	0.165
	(0.115)	(0.114)

	HMO_PPO	PFFS
cc164	-0.146***	-0.163***
	(0.0256)	(0.0222)
cc174	-0.352***	-0.310***
	(0.135)	(0.120)
cc176	-0.161***	-0.0312
	(0.0540)	(0.0424)
cc177	0.0616	0.0313
	(0.0846)	(0.0794)
Constant	-7.256***	-4.894***
	(0.631)	(0.282)
Observations	10,057,900	10,057,900

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1