

# Determinants of Medicare Plan Choices: Are Beneficiaries More Influenced by Premiums or Benefits?

Paul D. Jacobs, PhD; and Melinda B. Buntin, PhD

Policy makers have considered a range of options to slow Medicare spending growth, from provider payment cuts to more comprehensive delivery system and financing reforms. Some of these more comprehensive proposals aim to give beneficiaries greater incentives to select lower-cost options for health insurance than what they face today.<sup>1</sup> The degree to which such proposals would lower Medicare's costs depend in part on how responsive beneficiaries are to financial and market incentives when making 2 key health coverage decisions: 1) choosing between enrollment in traditional fee-for-service (FFS) Medicare or a private Medicare Advantage (MA) plan; and 2) if enrolling in MA, which plan to choose.

We sought to address several issues that are relevant to some of the choices policy makers would face in restructuring Medicare's current financial incentives. First, we calculated an elasticity of plan choice to inform the overall level of enrollee responsiveness to health insurance premiums in today's environment. Second, we investigated whether Medicare beneficiaries chose MA plans mostly on the basis of the benefits offered or the premiums charged. Third, we explored the relationship between the average attractiveness of MA plans in an area and MA (compared with FFS) market share. Finally, because plan choice reforms often envision larger subsidies for lower-income beneficiaries, we looked at how sensitivity to financial incentives varies by income level.

An important focus of this paper is whether elderly beneficiaries are more sensitive to premiums or benefits when selecting plans in the MA market. MA plans are available in nearly every county, although the number varies considerably. Beneficiaries enrolled in both Medicare Part A (hospital and other related coverage) and Part B (physician and outpatient coverage) can enroll in the MA program.

Insurers offering MA plans submit a bid reflecting their projected costs of providing Medicare A and B benefits to their target population. If the bid is below a statutorily set

## ABSTRACT

**Objectives:** To evaluate the sensitivity of Medicare beneficiaries to premiums and benefits when selecting healthcare plans after the introduction of Part D.

**Study Design:** We matched respondents in the 2008 Medicare Current Beneficiary Survey to the Medicare Advantage (MA) plans available to them using the Bid Pricing Tool and previously unavailable data on beneficiaries' plan choices.

**Methods:** We estimated a 2-stage nested logit model of Medicare plan choice decision making, including the decision to choose traditional fee-for-service (FFS) Medicare or an MA plan, and for those choosing MA, which specific plan they chose.

**Results:** Beneficiaries living in areas with higher average monthly rebates available from MA plans were more likely to choose MA rather than FFS. When choosing MA plans, beneficiaries are roughly 2 to 3 times more responsive to dollars spent to reduce cost sharing than reductions in their premium. We calculated an elasticity of plan choice with respect to the monthly MA premium of  $-0.20$ . Beneficiaries with lower incomes are more sensitive to plan premiums and cost sharing than higher-income beneficiaries.

**Conclusions:** MA plans appear to have a limited incentive to aggressively price their products, and seem to compete primarily over reduced beneficiary cost sharing. Given the limitations of the current plan choice environment, policies designed to encourage the selection of lower-cost plans may require increasing premium differences between plans and providing the tools to enable beneficiaries to easily assess those differences.

*Am J Manag Care.* 2015;21(7):498-504

benchmark, the plan is required to give back a portion of the difference to enrollees in the form of additional benefits, reduced cost sharing, and/or reduced premiums for Part B or Part D (prescription drug) coverage. (This paper uses the term “rebate” to represent any of these allocations.) A plan can also choose to offer additional benefits whose cost exceeds the value of any rebate, in which case the plan would charge a premium. MA plans compete with FFS by presenting beneficiaries with the trade-off between enrolling in a plan that constrains their use of medical care, but that usually offers rebates. We model beneficiary choice of a particular MA plan using actuarial data on premiums charged and rebates offered that MA plans submit to Medicare.

Previous research has generally found that the elderly are not very sensitive to premiums when selecting plans. Employment-based studies have found elasticities—the percent reduction in enrollment from a percent change in premium—ranging from  $-0.03$  to  $-0.27$  for retirees and older employees,<sup>2,4</sup> and studies of the MA market have found an elasticity of  $-0.13$  for elderly beneficiaries.<sup>5,6</sup> Moreover, sensitivity to premiums seems to decline with age.<sup>2,7</sup> Other studies have examined the choice between traditional FFS and MA, and have found varying sensitivity to premiums for supplemental coverage.<sup>2,6,8</sup>

This paper has 3 strengths not found together in prior work. First, we use data on plan choices, which, subject to our sample restrictions, are representative of the elderly Medicare population in the Part D era. Second, we use data from the MA program, which provide complete and detailed information on the generosity and types of benefits for all available plans. We are thus able to identify beneficiary sensitivity to plan benefits versus premiums. Third, we compare our main results with a subsample including those aged 65 to 70 years. The behavior of these beneficiaries will be more relevant to Medicare reforms that would affect only newly eligible beneficiaries.

## METHODS

### Model

Consistent with other studies, we assume that Medicare beneficiaries choose a plan to maximize their utility.<sup>9,10</sup> We use this framework to model 2 decisions that most beneficiaries make, using a 2-stage nested logit model: stage 1) whether to enroll in FFS or a private MA plan; and stage 2) for those opting for MA, which plan to choose. Our focus is on beneficiary choice of health insurance for full

### Take-Away Points

Our findings suggest that Medicare Advantage plans have a limited incentive to aggressively price their products, and seem to compete primarily over reduced beneficiary cost sharing.

- Beneficiaries with lower income are more sensitive to plan premiums and cost sharing, and higher-income beneficiaries tend to choose plans with wider networks.
- A large percentage of the Medicare population would probably not switch to plans with low premiums even if reforms resulted in a greater number of such options.
- Policies increasing premium differences between plans and the level of awareness of those differences might be needed to increase competitive pressures for beneficiaries to select lower-cost plans.

medical coverage, so we do not model the choice of supplemental health insurance for those choosing the FFS branch (Medigap). In the results, predicted probabilities are calculated zeroing out the person-level effects of stage 2, which explains why these percentages may differ from unconditional sample means. Additional details about the model and estimating concerns can be found in the [eAppendix](#) (available at [www.ajmc.com](http://www.ajmc.com)).

### Data

Our analysis begins with the 2008 Medicare Current Beneficiary Survey (MCBS), a nationally representative sample of the Medicare population ( $n = 11,099$ ). We excluded 24% of beneficiaries who were not aged 65 through 100 years at the end of 2008, or who died during the year. We also excluded beneficiaries receiving financial assistance or subsidies to choose particular types of plans that are not available to the broader population, including 38% who either reported having employer-based coverage (whether primary or secondary) or who had Medicaid. The latter criterion removes many beneficiaries eligible for the Part D low-income subsidy program, which reduces or eliminates their Part D premium.

Using county identifiers and the 2008 Medicare Advantage Bid Pricing Tool (BPT), which provides details on MA plan rebates, we link each beneficiary in our MCBS sample to information about every MA plan available to them. For example, if an MA plan submits a bid to cover beneficiaries for \$800 per month in an area where the benchmark is \$1000, the plan would receive \$150 (75% of the difference) to spend on rebates. The restricted-use version of the BPT shows how the plan allocates rebates among additional benefits, cost-sharing reductions, or premium reductions, providing more detail than the public use version used in previous research.<sup>11</sup> MA carriers may overstate expenses in their BPT submissions, implying that the true cost of rebated benefits would be somewhat lower than stated in the BPT.<sup>12</sup> However, plans must charge beneficiaries the exact premium they submit on the BPT, so measurement error

will affect our coefficients for rebated benefits but not for premiums. As explained below, our principal finding that beneficiaries are more sensitive to benefits than to premiums is strengthened because of this potential measurement error, which would bias the coefficients for benefits toward 0 but not those for premiums.

Using administrative data from the MA program, we linked each MA enrollee in our sample to their MA plan, which improves upon previous studies done without this link.<sup>6</sup> We excluded 4% of beneficiaries who reported that they were in MA, but could not be matched using the beneficiary-to-plan link. A comparison of these beneficiaries with those who were linked to plans across the 23 variables used in the choice of FFS or MA analysis (below) showed that beneficiaries were less likely to be linked if they were female, not married, or in the youngest age cohort (aged 65-75 years).

After removing 1% of beneficiaries who were enrolled in special needs MA plans—which serve individuals with chronic or disabling conditions—or those linked to employer plans but who reported otherwise, our estimating sample contained 3679 observations. Of these, the 1039 MA enrollees support our analysis of MA plan choice, and after linking these beneficiaries to their plan choices in the BPT, formed a sample of 48,963 beneficiary-plan combinations.

### Determinants of Choosing FFS or MA (stage 1)

Various features of each MA market may influence beneficiaries' choice of whether to enroll in FFS or MA. (eAppendix Tables 1 and 2 provide summary statistics for the variables in our model.) In counties where benchmarks are high relative to carriers' costs of providing benefits, plans will tend to offer more rebates, thus attracting beneficiaries to the MA sector. Our analysis includes the average amount rebated to beneficiaries in each county across all MA plans, as well as the number of plans available in the county—both of which increase the likelihood that beneficiaries will be able to find a plan that suits their taste. We also include the squared number of plans to test whether, beyond a certain number of plans, individuals are less likely to choose MA—a possible indication that the costs of obtaining information about a large number of plans exceed the benefits of participating in MA.

To control for 2 important (and potentially offsetting) pathways to MA take-up, our model includes average FFS spending in the county in 2008. Per capita FFS spending in a county is highly correlated with higher premiums for Medigap supplemental coverage, and thus FFS spending may be positively related to MA take-up.<sup>13</sup> However, higher per

capita FFS spending usually indicates more intensive service use, and therefore is potentially associated with a preference for FFS among beneficiaries in certain areas.

Beneficiaries' preferences for MA may be associated with their personal characteristics. Previous research has found that lower-income beneficiaries and those reporting better health status are more likely to choose MA plans. In addition to these variables, we also control for age, gender, marital status, race, ethnicity, and educational attainment. Additionally, we include the best available proxy for financial assets in our data: whether a beneficiary owned a second home.

### Determinants of Choosing an MA Plan (stage 2)

Using the MA plan's monthly premium (including any additional amount for Part D coverage), we estimated a premium elasticity using an approach adopted in other studies.<sup>6</sup> We also included several plan characteristics that reflect the amount the MA plan allocates to enhancements to the FFS benefit package, including reductions in cost sharing or additional benefits not covered in the FFS package, such as hearing, vision, and dental care. (Because many MA plans have no enrollee premium, in eAppendix Table 3 we show the sensitivity of our results to including an indicator variable for so-called "zero premium" plans; the results are not dissimilar from our key findings.) Finally, we included an indicator for whether the MA plan offered a Part D prescription drug plan.

We also assessed the effect on plan choice when MA plans applied rebates to reduce the Part D or Part B premiums. Thus, in addition to measuring the direct effect of the premium that beneficiaries observe, we are also able to control for whether their premiums were reduced because of rebates. Excluding these controls for rebates would bias the coefficient for the main premium variable that we use to develop our premium elasticity.

A potential concern with our empirical approach is that insurers may set premiums and benefits to appeal to beneficiary preferences, causing rebates—at least in part—to be associated with unobservable characteristics of beneficiaries and confounding the analysis. Our conclusions, however, were insensitive to including indicator variables for the 15 largest MA insurers, implying that insurer pricing strategies are not systematically correlated with unobserved components of beneficiary demand.<sup>14</sup>

## RESULTS

In this section we discuss results from the 2 stages of our model: the choice of MA or FFS, and the choice of

■ **Table 1. Effects on Enrollment Resulting from Changes in Selected Determinants of Plan Choice<sup>a</sup>**

	Entire Sample			Subsample With Only 65- to 70-year-olds		
	Marginal effect	Statistical significance	Standard deviation	Marginal effect	Statistical significance	Standard deviation
<b>Stage 1</b>						
Change in predicted probability in MA (compared with FFS) resulting from:		(n = 3679)		(n = 850)		
An increase of 1 standard deviation in monthly rebate available, on average, in MA plans	0.032	*	\$24.75	0.027		\$26.42
1 additional MA plan available in the county	0.007	**	n/a	0.008	**	n/a
<b>Stage 2</b>						
Change in predicted probability of enrollment in a particular MA plan (compared with other available plans) resulting from an increase of 1 standard deviation in:		(n = 1039)		(n = 281)		
Monthly premium	-0.027	**	\$44.65	-0.037	**	\$42.68
Monthly amount spent by plan for cost sharing	0.070	**	\$42.77	0.083	**	\$42.77
Monthly amount spent by plan for supplemental benefits	-0.003		\$32.68	-0.010		\$31.42
Monthly amount spent by plan to lower Part D premium	0.008	**	\$8.14	0.010		\$8.66
Monthly amount spent by plan to lower Part B premium	-0.011	**	\$14.44	-0.033	*	\$15.95
FFS indicates traditional Medicare fee-for-service; MA, Medicare Advantage. *denotes significance at 5% level; **denotes significance at 1% level. <sup>a</sup> Authors' calculations of Medicare Current Beneficiary Survey (MCBS), 2008, and Medicare Advantage Bid Pricing Tool, 2008. Sample includes beneficiaries surveyed by the MCBS in 2008, aged between 65 and 100 years, who had Medicare coverage and who did not have employer-based or Medicaid supplemental coverage. Plan choices exclude special needs plans and employer-sponsored plans.						

a specific MA plan. We compute marginal effects for selected determinants in both parts. Regression results for all specifications are available in eAppendix Table 3.

### Choice of FFS Versus MA (stage 1)

Our analysis suggests Medicare beneficiaries respond to the characteristics of local MA markets when deciding whether to choose MA or FFS. An increase of 1 standard deviation (\$25) in the average monthly rebate available in the county (compared with a nationwide sample mean of \$54) would lead to a 3.2–percentage point increase in the probability that a person would choose MA (Table 1). That represents a sizable effect given that approximately 31% of beneficiaries in our estimating sample chose MA rather than FFS in 2008.

Beneficiaries are also sensitive to the number of MA plans available in their county. Each additional MA plan in a county is associated with an increase in the probability of MA enrollment of 0.7 percentage points (Table 1). We calculated the predicted probability of choosing MA over the range of plans available in our sample (1 to 114) using the coefficients for the number of plans and that number squared

(eAppendix Table 3). The inflection point where each additional plan predicts a lower likelihood of MA enrollment is about 87 plans, which does not suggest that a large number of plans inhibits the choice of the MA program.

The choice of MA or FFS is also related to demographic characteristics (full results available in eAppendix Table 3). Older beneficiaries (aged 86 years or more) and those reporting themselves to be in relatively poorer health are less likely to choose MA.

### Choice of a Particular MA Plan (stage 2)

The results from our second stage relate to determinants of Medicare beneficiaries' choice of a particular MA plan. An increase of 1 standard deviation in the monthly premium (\$45) reduces the predicted probability that a specific plan is chosen by 2.7 percentage points compared with the mean predicted probability of 92.5%. The implied premium elasticity from the monthly MA premium coefficient is -0.20. Other papers have calculated sensitivity to plan premiums by estimating the effect of a \$5 increase in monthly plan premiums, which in our case would reduce the probability of choosing a plan by 0.4 percentage

■ **Table 2.** Effect of Premiums and Cost Sharing on Probability of Enrollment, by Beneficiary Annual Income<sup>a</sup>

Change in predicted probability of enrollment in a particular MA plan resulting from an:				
	Increase of 1 SD in monthly plan premium	Statistical significance	Increase of 1 SD in amount spent by plan to reduce cost sharing	Statistical significance
	(n = 1039)		(n = 1039)	
Annual income:				
<\$20,000	-0.036	**	0.085	**
\$20,000 to <\$30,000	-0.024	**	0.066	**
\$30,000 to <\$40,000	-0.026	**	0.074	**
≥\$40,000	-0.019	**	0.051	**

MA indicates Medicare Advantage.  
 \*denotes significance at 5% level; \*\*denotes significance at 1% level.  
<sup>a</sup>Authors' calculations of Medicare Current Beneficiary Survey (MCBS), 2008, and Medicare Advantage Bid Pricing Tool, 2008. Sample includes beneficiaries surveyed by the MCBS in 2008 aged between 65 and 100 years who had Medicare coverage, who did not have employer-based or Medicaid supplemental coverage. Plan choices exclude special needs plans and employer-sponsored plans.

points. This inelastic response to MA premiums is similar to prior results for the elderly.<sup>3,6</sup>

Table 1 also shows that beneficiaries appear to choose MA plans that spend more to reduce cost sharing, but they are insensitive to the amount spent on supplemental benefits. An increase of 1 SD (\$43) in insurer spending to reduce beneficiary cost sharing increases the predicted probability of choosing such a plan by 7 percentage points. Beneficiaries appear roughly 2 to 3 times more responsive to reductions in cost sharing than they are to reductions in premiums.

Table 1 suggests beneficiaries favor plans that reduce their Part D premiums. A reduction of 1 standard deviation in the Part D premium (\$8) results in a 0.8–percentage point increase in enrollment. Beneficiaries appear to avoid plans that reduce their Part B premiums, but few plans (6%) offer this rebate, which may also be associated with other plan features that beneficiaries dislike that we cannot observe in our data.

The plan choice behavior of beneficiaries aged 65 through 70 years is not especially different from that of the broader elderly Medicare population. Table 1 shows that an increase of 1 standard deviation in the monthly MA premium (\$43) for this group would change the predicted probability of choosing a plan by only 3.7 percentage points, which is a small amount relative to the mean predicted probability of 90% for that sample. (Our estimated price elasticity for this group is  $-0.22$ .)

Beneficiaries with lower incomes are more sensitive to plan premiums and cost sharing. Beneficiaries with an annual income of less than \$20,000 appear twice as sensitive to health plan premiums as beneficiaries with incomes above

\$40,000. In **Table 2**, the change in the predicted likelihood of choosing a particular plan changes from  $-3.6$  to  $-1.9$  percentage points with an increase of 1 standard deviation in premiums (\$45). A potential explanation for the varying sensitivity by income is that higher-income beneficiaries are choosing plans with wider networks or other characteristics. As **Table 3** shows, higher-income beneficiaries are more likely to choose preferred provider organization or private FFS plans, and less likely to choose a health maintenance organization plan.

## DISCUSSION

Using detailed data from the MA program, we find that beneficiaries are more sensitive to the benefit features of plans than they are to premiums. Indeed, our estimated premium elasticities are small—even for the younger beneficiaries, whom one would expect to be more sensitive to premiums than older beneficiaries. These findings indicate that MA plans currently have a limited incentive to aggressively price their products, and confirm the anecdotal evidence that they compete primarily over reduced beneficiary cost sharing.

Our results also highlight a potential tension between increased competitiveness of the Medicare plan choice environment and ensuring that lower-income beneficiaries are not subject to excessive financial burdens. Our findings show that, when choosing among plans, lower-income beneficiaries are more sensitive to both cost sharing and premiums than those with higher incomes. If policy makers choose to insulate lower-income beneficiaries from certain financial inducements to choose cost-effective plans, the beneficiaries who are the most

■ **Table 3.** Type of Medicare Advantage Plan Chosen, Overall and by Beneficiary Annual Income<sup>a</sup>

	Sample Size	Plan Type Chosen		
		HMO	PPO	PFFS
Overall	1039	74%	10%	16%
By annual income:				
<\$20,000	314	78%	8%	14%
\$20,000 to <\$30,000	291	76%	7%	16%
\$30,000 to <\$40,000	171	74%	8%	18%
≥\$40,000	263	68%	15%	18%

HMO indicates health maintenance organization; PFFS, private fee-for-service; PPO, preferred provider organization.

<sup>a</sup>Authors' calculations of Medicare Current Beneficiary Survey (MCBS), 2008, and Medicare Advantage Bid Pricing Tool, 2008. Sample includes beneficiaries surveyed by the MCBS in 2008 aged between 65 and 100 years who had Medicare coverage, who did not have employer-based or Medicaid supplemental coverage.

Percentages may not sum to 100% because of rounding.

responsive to incentives would also be the most insulated from them. Reforms to Medicare would involve striking some balance between increased competition and adequate consumer protections.

The finding of beneficiary responsiveness to rebates is also important to bear in mind as policy makers consider further reductions to MA benchmarks. With lower benchmarks, and therefore reduced rebates, more beneficiaries may end up in FFS, where utilization levels tend to be higher. This finding is also important for premium support proposals because if federal contributions were uniform across the private and FFS sectors, private plans may have a reduced ability to offer rebates, although comparability between plans, particularly with regard to their premiums, may be enhanced.

### Limitations

There are several limitations to our study. Our sample is cross-sectional and thus we cannot observe beneficiaries over time or exploit how changes in health plan premiums and benefits might affect beneficiary behavior. The components of beneficiary demand that we cannot observe may imply that our estimates of premium sensitivity are a lower bound, though our results are insensitive to controlling for the 15 largest MA insurers' strategies, suggesting this issue is not critical to our findings. A related complication is that the plan and market characteristics we use to predict beneficiary choice in 2008 are not necessarily those that existed when the beneficiaries actively chose their plan, and while our findings for younger beneficiaries were similar to those for the elderly population overall, looking at beneficiary choices in the year that they were made may produce different results. Lastly, the clustering of MA plans' bids relative to the benchmark

reduces the amount of premium variation we observe and limits our ability to extrapolate our findings to larger premium changes. Nonetheless, our findings are broadly consistent with the literature finding relatively low premium elasticities in the elderly population.

### Implications

Our findings have important implications for reforms to the Medicare plan choice environment, although the difficulty of predicting beneficiary responses obviously grows as proposed reforms depart from current financial incentives. Our results suggest, for example, that a large percentage of the Medicare population would probably not switch to plans with low premiums even if reforms resulted in a greater number of such options. Given this lack of sensitivity to premiums in the current plan choice environment, policies designed to encourage the selection of lower-cost plans may require increasing premium differences between plans and structuring those choices so that beneficiaries can easily assess them.

## CONCLUSIONS

In summary, we find that MA enrollees are relatively insensitive to premiums, but more responsive to reductions in medical cost sharing in their benefit packages. Our findings are consistent with other studies documenting MA plans' limited incentives to price their products aggressively. Efforts to heighten premium differences between plans and to increase the level of awareness of those differences might be needed to induce more beneficiaries—especially those with higher incomes—to select more competitively priced plans.

**Author Affiliations:** Congressional Budget Office (PDJ), Washington, DC; Department of Health Policy, Vanderbilt University School of Medicine (MBB), Nashville, TN.

**Source of Funding:** None.

**Author Disclosures:** The authors report no relationship or financial interest with any entity that would pose a conflict of interest with the subject matter of this article. This analysis was conducted while Dr Jacobs was an employee at the Congressional Budget Office (CBO). He is currently an employee of the Agency for Healthcare Research and Quality (AHRQ). This paper has not been subject to CBO's or AHRQ's regular review and editing process. The views expressed here are those of the authors and should not be interpreted as those of CBO, AHRQ, or HHS.

**Authorship Information:** Concept and design (PDJ, MBB); acquisition of data (PDJ, MBB); analysis and interpretation of data (PDJ, MBB); drafting of the manuscript (PDJ, MBB); critical revision of the manuscript for important intellectual content (PDJ, MBB); statistical analysis (PDJ); administrative, technical, or logistic support (PDJ); and supervision (MBB).

**Address correspondence to:** Paul D. Jacobs, PhD, Agency for Healthcare Research and Quality, 540 Gaither Rd, Rockville, MD 20850. E-mail: paul.jacobs@ahrq.hhs.gov.

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## eAppendix

### Econometric Model

This paper assumes that beneficiaries choose plans with the aim of maximizing their utility, which is separable into individual and plan characteristics. Utility is expressed as:

$$U_{ij} = \beta X_{ij} + \gamma Y_i + \varepsilon_{ij}$$

where  $U_{ij}$  is the utility individual  $i$  experiences when enrolled in plan  $j$ .  $X_{ij}$  is a matrix of plan-specific attributes, such as the plan's premium and amount the insurer contributed to reduce medical cost sharing, that vary over person  $i$ 's choices.  $Y_i$  is a matrix of person-specific attributes, such as annual income or self-reported health status, as well as market-specific attributes, such as the average amount rebated to beneficiaries in each county across all Medicare Advantage (MA) plans offering coverage in that area.  $\varepsilon_{ij}$  is a randomly distributed error term.  $\beta$  and  $\gamma$  are vectors of coefficients that we seek to estimate.

We estimate a 2-stage nested logit model of Medicare plan choice decision making, including the decision to choose traditional fee-for-service (FFS) Medicare or an MA plan, and for those choosing MA, which specific plan they chose. We estimate this 2-part decision using limited information maximum likelihood within a nested logit model. Another choice would have been McFadden's conditional logit choice model.<sup>1</sup> We chose the nested logit structure instead because this model partially relaxes the independence of irrelevant alternatives (IIA) assumption, which has been shown to be violated when FFS is combined with all available MA plans.<sup>2</sup>

The probability an individual  $i$  chooses a particular plan  $j$  within the MA or traditional Medicare fee-for-service (FFS) branches can be expressed as:<sup>3</sup>

$$pr_{ij} = \frac{e^{\beta X_{ji} + \gamma Y_i}}{\sum_{i=1}^I \sum_{j=1}^{J^i} e^{\beta X_{ji} + \gamma Y_i}}$$

As noted above, the  $X$  matrix contains plan-specific characteristics of choice  $j$  in branch  $i$  and the  $Y$  matrix contains characteristics, both personal- and market-specific, relating to an individual's choice of branch.

As noted in the text, because Medicare beneficiaries may obtain supplemental coverage through a former employer or through state Medicaid programs, the precise choice set for supplemental coverage is not identifiable for many beneficiaries choosing the FFS sector. Additionally, the premiums and benefits associated with some of those choices are not available. Therefore, the FFS branch is degenerate; there is only 1 plan choice modeled when FFS is chosen because the primary benefits package is consistent across beneficiaries in this branch and the information about supplemental benefits is missing.<sup>2</sup> We estimate the nested logit model describe in the main

text using Limited Information Maximum Likelihood, which is consistent but not asymptotically efficient.<sup>3</sup>

The second stage of the nested logit (modeling the determinants of which MA plan a beneficiary selects) is a conditional logit model, which estimates take-up of a plan using person-level effects. This stage relies on variation in plan characteristics rather than individual characteristics and thus removes unobserved person-specific factors that may be related to the demand for health insurance. This modeling choice should allay concerns about the endogeneity of premium or benefit variables.

After estimating the above model, a key parameter of interest will be the premium elasticity that is implied by the coefficient on monthly MA plan premium. That elasticity is calculated as follows<sup>2</sup>:

$$\varepsilon = \beta * OOP\_Prem * [(1 - pr(plan = j)) + \theta * (1 - pr(sector = i) * pr(plan = j))]$$

where  $\beta$  is the coefficient from the second stage for the MA plan's monthly premium,  $OOP\_Prem$  is the mean amount for that variable,  $pr(plan = j)$  is the probability that a given plan is chosen,  $pr(sector = i)$  is the probability of choosing the MA sector, and  $\theta$  is the coefficient from the first stage for the inclusive value for choosing the MA sector.

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**eAppendix Table 1.** Weighted Means for Determinants of Medicare Advantage or FFS Choice, by Sector Chosen<sup>a</sup>

<b>Sector</b>	<b>FFS</b>	<b>MA</b>
Unweighted sample size	(n = 2640)	(n = 1039)
MA plan rebate available per month to enrollees (county-level)	\$50.786	\$62
Number of MA plans available (county-level)	30	48
Per capita FFS spending per month (county-level)	\$717	\$763
Annual income, <\$20,000	37%	29%
Annual income, \$20,000 - <\$30,000	22%	28%
Annual income, \$30,000 - <\$40,000	14%	16%
Annual income, ≥\$40,000	26%	26%
Female	59%	51%
Married	50%	62%
Identify as white	87%	79%
Identify as African American	5%	6%
Identify as nonwhite, Hispanic	4%	10%
Do not identify as white, African American, or Hispanic	3%	5%
Aged 65 to 75 years	49%	54%
Aged 76 to 85 years	36%	37%
Aged 85 years or older	15%	9%
Reported health status as excellent	15%	16%
Reported health status as very good	29%	32%
Reported health status as good	30%	33%
Reported health status as fair	14%	14%
Reported health status as poor	12%	5%
Educational attainment, less than high school degree	25%	23%
Educational attainment, high school graduate	33%	32%
Educational attainment, some college	27%	30%
Educational attainment, college degree or higher	16%	15%
Owns a second home	4%	4%

FFS indicates traditional Medicare fee-for-service; MA, Medicare Advantage.

<sup>a</sup>Authors' calculations of Medicare Current Beneficiary Survey (MCBS), 2008, and Medicare Advantage Bid Pricing Tool, 2008. Statistics weighted by MCBS sampling weight. Sample includes beneficiaries surveyed by the MCBS aged between 65 and 100 years, who had Medicare coverage and who did not have employer-based or Medicaid supplemental coverage.

**eAppendix Table 2.** Determinants of Medicare Advantage Plan Choice: Characteristics of Plans Available to Beneficiaries in Estimating Sample<sup>a</sup>

	<b>Mean</b>
Unweighted sample size	(n = 48,963)
Total monthly premium for MA plan including Part D coverage (if offered)	\$23.52
Percent of plans with Part D coverage	64.4%
Monthly amount spent by plan to reduce beneficiary cost sharing	\$47.50
Monthly amount spent by plan to pay for supplemental benefits	\$24.08
Monthly amount spent by plan to reduce beneficiary Part D premium	\$3.38
Monthly amount spent by plan to reduce beneficiary Part B premium	\$2.97
Percent of plans that are an HMO/POS plan	40.1%
Percent of plans that are a PPO plan	12.2%
Percent of plans that are a PFFS plan	47.7%

HMO indicates health maintenance organization; PFFS, private fee-for-service; POS, point-of-service; PPO, preferred provider organization.

<sup>a</sup>Authors' calculations of Medicare Current Beneficiary Survey (MCBS), 2008, and Medicare Advantage Bid Pricing Tool, 2008. Statistics weighted by MCBS sampling weight. Sample includes all available plan choices for Medicare Advantage (MA) enrollees surveyed by the MCBS in 2008 who were aged between 65 and 100 years, who did not have employer-based or Medicaid supplemental coverage. Sample excludes special needs plans and employer-sponsored MA plans.

**eAppendix Table 3.** Nested logit results for Medicare plan choice: logistic coefficients and statistical significance<sup>a</sup>

	Entire sample				Subsample with only 65 to 70 year-olds					
	Baseline model		Key variables interacted with income level		Plan types and interactions with premium	Including zero premium plan identifier		Baseline model		
	Logistic coefficient	Statistical significance	Logistic coefficient	Statistical significance	Logistic coefficient	Statistical significance	Logistic coefficient	Statistical significance	Logistic coefficient	Statistical significance
Choice of Medicare Advantage versus FFS	(n = 3628)		(n = 3628)		(n = 3628)		(n = 3628)		(n = 843)	
Intercept	-4.407	**	-4.442	**	-4.171	**	-4.394	**	-4.304	**
Average monthly MA plan rebate in county	0.026	**	0.023	**	0.026	**	0.027	**	0.017	
Average monthly rebate squared	0.000	*	0.000	*	0.000	**	0.000	*	0.000	
Number of MA plans available	0.077	**	0.077	**	0.071	**	0.077	**	0.075	**
Number of MA plans available squared	-0.001	**	-0.001	**	-0.001	**	-0.001	**	-0.001	**
Per capita FFS spending per month	-0.002	**	-0.001	**	-0.002	**	-0.002	**	-0.002	%
Annual personal income, <\$20,000	0.106		-0.059		0.122		0.107		0.206	
Annual personal income, \$20,000-<\$30,000	0.458	**	0.394	**	0.448	**	0.459	**	0.700	**
Annual personal income, \$30,000-<\$40,000	0.190		0.092		0.169		0.189		0.047	
Female	-0.226	*	-0.220	*	-0.199	*	-0.226	*	-0.166	
Married	0.477	**	0.477	**	0.469	**	0.477	**	0.331	
Identify as African-American	-0.010		-0.022		0.066		-0.011		-0.553	
Identify as non-white, Hispanic	0.207		0.211		0.177		0.205		0.151	
Do not identify as white, African-American, or Hispanic	0.228		0.246		0.192		0.224		-0.239	
Ages 65 to 75	0.426	**	0.414	**	0.448	**	0.427	**		
Ages 76 to 85	0.412	**	0.397	**	0.441	**	0.412	**		
Reported health status as excellent	0.932	**	0.952	**	0.952	**	0.929	**	1.168	*
Reported health status as very good	0.955	**	0.963	**	0.963	**	0.953	**	1.264	*
Reported health status as good	0.959	**	0.962	**	0.962	**	0.957	**	1.020	*
Reported health status as fair	0.775	**	0.792	**	0.789	**	0.773	**	1.234	*
Educational attainment, less than high school	0.381	**	0.388	**	0.412	*	0.383	*	0.920	**
Educational attainment, high school graduate	0.402	**	0.397	**	0.406	**	0.402	**	1.100	**
Educational attainment, some college	0.310	*	0.317	*	0.300	*	0.310	*	0.824	**
Owns a second home (asset proxy)	-0.326		-0.345		-0.343		-0.326		0.645	
Inclusive value from MA choice branch	0.000	**	0.000	*	0.002	**	0.000	**	0.000	%

% = denotes significance at 10% level; \* = denotes significance at 5% level; \*\* = denotes significance at 1% level

**eAppendix Table 3.** Nested logit results for Medicare plan choice: logistic coefficients and statistical significance<sup>a</sup> (*continued*)

	Entire sample						Subsample with only 65 to 70 year-olds			
	Baseline model		Key variables interacted with income level		Plan types and interactions with premium		Including zero premium plan identifier		Baseline model	
	Logistic coefficient	Statistical significance	Logistic coefficient	Statistical significance	Logistic coefficient	Statistical significance	Logistic coefficient	Statistical significance	Logistic coefficient	Statistical significance
Choice of Medicare Advantage plan										
Total monthly premium for MA plan	-0.009	**	-0.006	**	-0.001		-0.006	**	-0.010	**
Part D coverage offered with MA plan	2.520	**	2.522	**	2.059	**	2.564	**	2.296	**
Monthly amount to reduce beneficiary cost-sharing	0.024	**	0.017	**	0.015	**	0.024	**	0.022	**
Monthly amount to pay for supplemental benefits	-0.001		-0.001		-0.010	**	-0.003		-0.004	
Monthly amount to reduce beneficiary Part D premium	0.014	**	0.014	**	0.010	*	0.009	*	0.013	%
Monthly amount to reduce beneficiary Part B premium	-0.011	**	-0.011	**	-0.013	**	-0.012	**	-0.023	*
MA premium * income, <\$20,000			-0.006	*						
MA premium * income, \$20,000-<\$30,000			-0.002							
MA premium * income, \$30,000-<\$40,000			-0.002							
Reduction in cost-sharing * income, <\$20,000			0.012	**						
Reduction in cost-sharing * income, \$20,000-<\$30,000			0.005	%						
Reduction in cost-sharing * income, \$30,000-<\$40,000			0.008	*						
Plan is a PPO					-0.765	**				
Plan is PFFS					-1.573	**				
PPO * total monthly premium					-0.007	*				
PFFS * total monthly premium					-0.004	*				
Plan has \$0 monthly premium							0.475	**		

% = denotes significance at 10% level; \* = denotes significance at 5% level; \*\* = denotes significance at 1% level

<sup>a</sup> Authors' calculations of Medicare Current Beneficiary Survey (MCBS), 2008, and Medicare Advantage Bid Pricing Tool, 2008. Sample includes beneficiaries surveyed by the MCBS in 2008 aged between 65 and 100 years who had Medicare coverage and who did not have employer-based or Medicaid supplemental coverage. Sample excludes special needs plans and employer-sponsored Medicare Advantage plans.