The Value of Automatic Enrollment: Evidence from the Oregon Health Insurance Experiment

Daniel Kwiatkowski
Washington and Lee University

Sasha Ruby
JPMorganChase Institute

October 2026

Preliminary. Please do not cite.

Abstract

This paper revisits a classic rationale for conditioning in-kind transfers on affirmative application: take-up may be advantageously self-targeted on financial need, thereby concentrating benefits among the neediest. But take-up may also be disadvantageously self-targeted on willingness to pay – especially where the transfer subsidizes a normal good or displaces alternatives used most by the neediest. In Medicaid, using the Oregon Health Insurance Experiment, we find voluntary participants exhibit greater need but lower willingness to pay. Our estimates imply that automatic enrollment raises the surplus generated by Medicaid from $270 to $390 per eligible. Accounting for need alone, automatic enrollment would reduce surplus.

Daniel Kwiatkowski: dkwiatkowski@wlu.edu
Sasha Ruby: nathaniel.ruby@gmail.com
We are very grateful to Lee Lockwood, John Pepper, Derek Wu, and Timothy Layton for their guidance and Charlie Rafkin for helpful feedback. This material is based upon work supported by the Bankard Fund for Political Economy Pre-Doctoral Fellowship.

1 Introduction

In the United States, participation in means-tested in-kind transfer programs is voluntary, and a substantial share of eligible individuals do not participate. The classic rationale for requiring an affirmative application, rather than enrolling eligible individuals automatically, is self-targeting: those who choose to participate differ from those who do not on characteristics that eligibility rules do not capture (Nichols and Zeckhauser, 1982). Consistent with this rationale, Rafkin et al. (forthcoming) show that across a range of U.S. transfer programs, eligible participants have greater financial need than observably similar eligible non-participants.

This rationale is incomplete. Eligible individuals differ in their willingness to pay for in-kind transfers, and the neediest need not exhibit the highest willingness to pay. Willingness to pay may fall with need for two reasons. First, if the transfer displaces an informal alternative to which lower-income individuals have greater access, then the transfer relaxes the neediest's budget constraint by less. Second, if the transferred good is normal, then higher-income eligible individuals consume more of it absent the transfer and therefore have their budget constraint relaxed by more. If the willingness to pay for an in-kind transfer falls with need then the choice between voluntary enrollment and automatic enrollment involves a trade-off between concentrating benefits among the neediest and extending benefits to those with the highest willingness to pay.

In this paper, we quantify the welfare implications of this trade-off in Medicaid, where the informal alternative to coverage – uncompensated care – increases with need.[1] Using data from the Oregon Health Insurance Experiment (OHIE), we compare voluntary participants (individuals who enroll under voluntary enrollment) and auto-induced participants (individuals who would enroll only under automatic enrollment) along their financial need and willingness to pay for coverage. Building on these comparisons, we develop a welfare framework that quantifies the ex-ante surplus – the insurance value from receiving coverage in higher marginal-utility states less the cost of provision – generated by Medicaid under both enrollment regimes.

The OHIE provides the variation necessary to model the decision to participate, and participant behavior, under both voluntary and automatic enrollment. The experiment assigned the opportunity to apply for Medicaid by lottery, creating experimental variation in participation. The experiment yields three choice groups: always-takers (who enroll regardless

[1] Lockwood (forthcoming) shows that uncompensated care through charity care, sliding-scale discounts, and unpaid debt increases with need.

of whether they win the lottery), compliers (who enroll only if they win the lottery), and never-takers (who do not enroll even if they win the lottery). These choice groups map naturally to voluntary and automatic enrollment: always-takers and compliers participate under voluntary enrollment and never-takers participate only under automatic enrollment.[2]

We begin with a descriptive analysis of how Medicaid-eligible individuals select into coverage. We focus on selection on household income, which captures redistributive need, and selection on out-of-pocket medical spending – a lower bound on the willingness to pay for Medicaid. We document two facts. First, out-of-pocket medical spending rises with household income among Medicaid-eligible individuals. We show that this variation arises in part because eligible individuals have access to alternative sources of coverage (such as implicit insurance through charity care, provider discounts, and unpaid medical bills).[3] Second, individuals who voluntarily enroll in Medicaid have lower incomes and lower out-of-pocket spending than individuals who would enroll only under automatic enrollment. Together, these facts imply that advantageous selection into Medicaid on need coincides with disadvantageous selection on out-of-pocket spending. Automatic enrollment would therefore extend coverage to individuals who are less disadvantaged but have higher without-Medicaid out-of-pocket spending.

Building on these facts, we develop a sufficient-statistics style model, in the spirit of Deshpande and Lockwood (2022), to quantify the welfare implications of expanded enrollment. The approach highlights the importance of four objects in determining the ex-ante surplus generated by Medicaid: marginal utility of consumption; without-Medicaid out-of-pocket health spending; and without- and with-Medicaid total health spending. The OHIE identifies these objects for compliers but not for always-takers or never-takers. We address this challenge by estimating marginal treatment response (MTR) functions that combine the experimental variation from the OHIE with a latent index participation model (Heckman and Vytlacil, 1999). This approach allows us to recover the relevant outcomes for voluntary participants and auto-induced participants and therefore evaluate Medicaid under both enrollment regimes.

The MTR estimates are consistent with the selection patterns suggested by the descriptive analysis. We find advantageous selection on marginal utility – voluntary participants exhibit a higher redistributive markup (3.9) than auto-induced participants (2.7) – and disadvantageous selection on willingness to pay – voluntary participants exhibit lower willingness to pay

[2]Our results are robust to an alternative interpretation in which only always-takers participate under voluntary enrollment and compliers and never-takers participate only under automatic enrollment.

[3]The importance of these informal channels in reducing the out-of-pocket costs of medical care is documented in Lockwood (forthcoming).

for coverage ($560) than auto-induced participants ($770). We further find meaningful selection on cost: voluntary participants generate more without- and with-Medicaid total health spending ($3,680 and $4,610) than auto-induced participants ($2,610 and $3,500). Medicaid for voluntary participants generates $530 of surplus per recipient per year while Medicaid for auto-induced participants generates $240 of surplus per recipient per year. These findings imply that not only does Medicaid generate considerable ex-ante surplus under voluntary enrollment, but expanding from voluntary enrollment to automatic enrollment would further increase this surplus. These conclusions are robust to how we define eligibility for Medicaid and the value of induced medical care.

We decompose the surplus from auto-induced participants into a mechanical effect and a selection effect. The mechanical effect captures the per-participant surplus that automatic enrollment would generate if Medicaid generated the same surplus for auto-induced participants as it does for voluntary participants. The selection effect captures the departure from that benchmark. We further decompose the selection effect to assess the relative importance of selection on need and selection on willingness-to-pay. We find that selection on need reduces auto-induced per-participant surplus by $790 while selection on willingness-to-pay raises auto-induced per-participant surplus by $680. Although smaller in magnitude, the willingness-to-pay channel determines the sign of auto-induced surplus: absent its contribution, auto-induced participants would generate approximately −$440 rather than $240 per recipient, and automatic enrollment would reduce rather than raise per-eligible surplus.

There are several points worth emphasizing when interpreting our results. First, our analysis, like most welfare analyses, takes other policies as given. Other components of the safety net, particularly uncompensated care, play a large role in determining the value of Medicaid. Second, our main analysis focuses on the blanket automatic enrollment of Medicaid-eligible individuals but our framework and methodology are well-suited to also evaluate other forms of automatic enrollment, which we revisit in Section 5.4. This analysis does not speak to the implications of other reforms – such as changes to eligibility determination – that might alter how individuals select into Medicaid or how they behave once enrolled. Third, while our results are specific to the OHIE, the two empirical patterns upon which they rest are well-documented: selection into Medicaid is advantageous on need (Rafkin et al., forthcoming) and willingness-to-pay for health insurance falls as need rises (Finkelstein et al., 2019b; Lockwood, forthcoming).

On its own, the first pattern – advantageous selection into Medicaid on need – suggests that expanding enrollment would decrease the per-eligible surplus generated by Medicaid. The second pattern complicates this conclusion. Although expanding enrollment weakens redis-

tributive targeting on need, it also extends coverage to individuals with greater willingness to pay for Medicaid. We find that this disadvantageous selection on willingness-to-pay is strong enough that automatic enrollment increases the total surplus generated by Medicaid.

Our primary contribution is to quantify the welfare consequences of moving from voluntary to automatic enrollment. We build on a literature that captures the value of in-kind transfer programs using sufficient-statistics style frameworks (Lieber and Lockwood, 2019; Deshpande and Lockwood, 2022; Rafkin et al., forthcoming).[4] These frameworks depend on only a few objects: need, willingness to pay for the transfer, and cost. They also carry an account of selection, since the difference in surplus between any two groups of participants decomposes into selection on each of these objects.

We show that the welfare consequences of automatic enrollment depend jointly on selection on value – on need and on willingness to pay – and on selection on cost. On value, existing work has largely evaluated selection on need alone (Deshpande and Lockwood, 2022; Rafkin et al., forthcoming), capturing advantageous selection on need but missing selection on willingness to pay.[5] On cost, voluntary and auto-induced participants differ in both out-of-pocket and total health spending, both of which contribute to the costs of enrollment (Shepard and Wagner, 2025).

Evaluating selection along these margins requires the welfare-relevant objects not only for compliers, whose outcomes the OHIE identifies directly, but also for always-takers and never-takers, whose counterfactual outcomes are not identified by the experiment alone. Each choice group is essential to this comparison: voluntary participants are always-takers and compliers while auto-induced participants are never-takers. We recover these objects by combining the lottery with a latent-index model of participation and estimating marginal treatment response functions within the marginal treatment effects framework (Heckman and Vytlacil, 1999; Kline and Walters, 2016; Mogstad et al., 2018). This yields the value of Medicaid under each enrollment regime.

[4]There is also a broader positive literature that documents how the composition of participants in these programs changes as enrollment rules change, without directly evaluating the welfare consequences of increased participation. See Bhargava and Manoli (2015) on the EITC; Deshpande and Li (2019) on disability insurance; and Homonoff and Somerville (2021) and Wu and Meyer (forthcoming) on SNAP recertification.

[5]Lieber and Lockwood (2019) show that program value depends on both need and willingness to pay; we show that selection on both margins determines the welfare implications of enrollment policy.

2 The Oregon Health Insurance Experiment

The Oregon Health Insurance Experiment (OHIE) both reveals how Medicaid-eligible individuals select into coverage and provides the variation necessary to assess the positive and normative implications of voluntary and automatic enrollment.

Experimental Variation. Conducted between March 2008 and September 2008, the OHIE used a lottery to expand Medicaid coverage to low-income, uninsured non-senior adults (ages 19–64) who were not otherwise categorically eligible for Medicaid.[6] The expansion offered comprehensive medical benefits with no patient cost-sharing and minimal to no monthly premiums (Finkelstein et al., 2012). Random assignment through the lottery serves as an instrument for Medicaid participation.[7] Registration for the lottery was open and unscreened, so many lottery registrants were not in fact Medicaid-eligible. We restrict attention to individuals with household incomes below 150% of the Federal Poverty Line, whom we treat as likely eligible.[8]

Participation was incomplete – many eligible individuals selected by the lottery chose not to participate and many not selected by the lottery managed to participate through other channels. This imperfect compliance generates three choice groups: always-takers, who participate whether or not they are selected by the lottery; compliers, who participate if selected by the lottery but not otherwise; and never-takers, who do not participate even when selected by the lottery. In the baseline analysis, always-takers and compliers correspond to participants under voluntary enrollment while never-takers correspond to individuals who would participate only under automatic enrollment.

We draw on four sources of data: the lottery registration form, which records sex, age, metropolitan area residence, and language preference; state administrative records, which provide indicators for pre-randomization SNAP and TANF participation; an initial survey conducted shortly after randomization, which records race and household composition; and a follow-up survey conducted approximately one year after randomization, which we use for the welfare analysis. We provide additional details about the data from the OHIE in

[6] Individuals who were categorically eligible for Medicaid – including low-income children, pregnant women, individuals with disabilities, and TANF families – were covered under Oregon's OHP Plus program. The OHIE expanded access to a distinct program, OHP Standard, which covered low-income adults without categorical eligibility.

[7] The probability of winning the lottery varied with the number of household members who entered. Following Kowalski (2023), we restrict the sample to individuals who were the only member of their household to enter the lottery.

[8] This definition of likely-eligible individuals is imperfect due to income measurement error, the timing of income measurement, and additional eligibility criteria used in the OHIE. We assess robustness to alternative eligibility definitions.

Appendix A.

3 Descriptive Analysis: Selection into Medicaid

Our goal in this section is to characterize how financial need and out-of-pocket health costs vary across eligible individuals and how self-selection into the program changes the composition of participants along these dimensions. We document two facts that together imply that automatic enrollment would lower the average need of participants while raising the financial protection the program provides per participant.

Finding 1: Out-of-pocket medical spending is increasing in household income; uncompensated care is decreasing in household income. Figure 1a plots average out-of-pocket medical spending against household income for all Medicaid-eligible individuals. Out-of-pocket medical spending rises with household income. Figure 1b provides an explanation for this relationship: uncompensated care – total health spending net of out-of-pocket medical spending – falls with household income. This residual likely reflects the availability of charity care, provider discounts, and unpaid medical bills that substitute for formal insurance coverage.[9] Because the neediest eligible individuals are already substantially shielded from out-of-pocket medical costs, Medicaid delivers more incremental financial protection to less needy individuals – precisely because they bear more of their medical costs themselves.

Finding 2: Voluntary participants have lower incomes and lower out-of-pocket medical spending than auto-induced participants. The individuals who select into Medicaid voluntarily are concentrated at the bottom of the income distribution. This is consistent with the well-documented pattern that eligible individuals self-target on financial need in Medicaid (Rafkin et al., forthcoming). Figure 2a shows the distribution of household income separately for voluntary and auto-induced participants. Approximately 19% of voluntary participants report zero income compared to 10% of auto-induced participants. Mean household income is $6,570 for voluntary participants compared to $10,490 for auto-induced participants. Given the out-of-pocket spending–income gradient established in Figure 1a, this difference in income implies a corresponding difference in out-of-pocket spending. Figure 2b confirms this directly. Nearly 50% of voluntary participants report zero out-of-pocket medical spending compared to 42% of auto-induced participants. Mean out-of-pocket medical spending is $660 for voluntary participants compared to $830 for auto-induced participants. The individuals who are most likely to participate in Medicaid voluntarily are those with the

[9] See Mahoney (2015); Finkelstein et al. (2019b); and Lockwood (forthcoming).

lowest out-of-pocket medical spending.[10] This pattern complicates the common concern that automatic enrollment would extend coverage to individuals who do not need the program – the individuals to whom it would extend coverage are less needy but bear substantially more of their medical costs out of pocket.

Findings 1 and 2 together establish the central trade-off. Among eligible individuals, out-of-pocket spending rises with income, and those who select into Medicaid voluntarily have greater need but lower out-of-pocket exposure. Whether automatic enrollment raises or lowers the surplus Medicaid generates depends on the relative magnitudes of these offsetting patterns and on how the cost of coverage varies across participants. Neither is settled by the descriptive comparison: weighing need against willingness to pay requires a normative framework, and cost requires an object these comparisons cannot deliver.[11]

Robustness. These patterns are robust to alternative eligibility definitions, sample restrictions, and grouping schemes. The descriptive facts are qualitatively unchanged when eligibility is defined at 100% or 200% of the Federal Poverty Line (Appendix Figures C.2 and C.3) and when the sample is expanded to include individuals who report Medicaid participation despite not meeting our baseline eligibility criteria, or when no eligibility restrictions are imposed (Appendix Figures C.4 and C.5). To address the concern that differences across groups reflect causal effects of Medicaid rather than differences that are present prior to enrollment, we restrict attention to individuals who report no insurance coverage at the time of the initial survey and find that the patterns are largely unchanged (Appendix Figure C.6). Finally, these findings also hold under an alternative grouping scheme in which only always-takers are voluntary participants and both compliers and never-takers are auto-induced participants (Appendix Figure C.7).

External Validity. The individuals who registered for the OHIE are not representative of the national Medicaid-eligible population (Finkelstein et al., 2012). The external validity of this analysis hinges on whether selection into Medicaid among OHIE registrants resembles selection into Medicaid nationally. Table 1 shows that it does. In the OHIE, we split lottery winners by whether they enrolled in Medicaid and report their characteristics at the 0-month survey. For a national comparison, we take Medicaid-eligible adults (household heads and spouses) in the PSID who are not enrolled in wave t and split them by whether

[10] We assess robustness to the possibility that the lower out-of-pocket spending among voluntary participants reflects the causal effect of Medicaid coverage rather than differences in without-Medicaid out-of-pocket spending.

[11] The cost of coverage depends on how total medical spending responds to enrollment – a causal effect rather than a difference in means and one the lottery identifies only for compliers. Section 4.5 recovers this causal effect for always-takers and never-takers by combining the lottery with a model of program participation.

they are enrolled in wave $t+1$, two years later: those who enroll are PSID voluntary participants, and those who do not are PSID auto-induced participants. We again report characteristics before enrollment, in wave t. Both populations advantageously select into Medicaid on financial need. OHIE and PSID voluntary participants have lower household incomes ($6,570 and $13,070) than auto-induced participants ($10,490 and $14,520), and PSID voluntary participants also have lower consumption ($18,930 versus $26,190). Both populations also disadvantageously select into Medicaid on out-of-pocket medical spending: OHIE and PSID voluntary participants spend less out of pocket ($660 and $410) than auto-induced participants ($830 and $710).

4 Welfare Framework and Estimation

Our goal is to quantify the ex-ante surplus generated by Medicaid coverage under voluntary and automatic enrollment: the extent to which the value of coverage to individuals in high marginal utility states exceeds its cost, including the costs from behavioral distortions. Like any welfare analysis, ours depends on assumptions that map observable choices into unobservable surplus. In our case, the key assumptions are that individuals optimize given their budget constraint and that Medicaid affects individuals only through that constraint. In the empirical implementation, we make additional assumptions when estimating counterfactual outcomes.

4.1 Participation

We evaluate Medicaid from behind the veil, from the perspective of an individual who does not yet know which state of the world they will occupy: a taxpaying state, in which they help finance the program, or an eligible state, in which they meet Medicaid's eligibility criteria and may receive coverage. We index eligible states by observed characteristics X and an unobserved scalar ν; we do not distinguish among taxpaying states but instead summarize these states by the average marginal utility of income they deliver.

Within eligible states, participation is determined by the decision to enroll. Following Vytlacil (2002), let $D \in \{0,1\}$ denote Medicaid participation and $Z \in \{0,1\}$ lottery assignment, so that

$$D = \mathbf{1}\{\nu \leq \psi(X,Z)\}, \tag{1}$$

where ν captures (unobserved) resistance to participation. We assume monotonicity – lottery

selection weakly increases participation in all states – and full independence of Z conditional on X.

4.2 Value and Cost

Let Ω denote a set of eligible states (X, ν). The value and cost of coverage are functions of the state, so each welfare object below is an expectation over the states in Ω, which we write $\mathbb{E}[\,\cdot \mid \Omega\,]$.

Ex-Ante Individual Value. The ex-ante value of Medicaid in states Ω is

$$EAWTP(\Omega) = \mathbb{E}[\mu\, WTP \mid \Omega]\,, \tag{2}$$

where $\mu \equiv \lambda/\Lambda_\tau$ is the redistributive markup (λ the marginal utility of income in the state and Λ_τ its average across taxpaying states), and WTP is ex-post willingness to pay for coverage. The two terms play distinct roles: WTP measures how many dollars of resources coverage delivers in a given state, and μ converts these dollars into taxpaying-state dollars, marking them up in the states where a dollar is worth most. Medicaid coverage is more valuable the larger the transfer and the higher the marginal utility of the states in which the transfer occurs.

Ex-Ante Direct Cost. Medicaid imposes a direct fiscal cost equal to government spending on participants' medical care:

$$EAG(\Omega) = \mathbb{E}[G \mid \Omega]\,, \tag{3}$$

where G is the ex-post direct cost of providing Medicaid coverage.

Ex-Ante Externalities. Medicaid participation generates externalities beyond individual benefits in participating states and direct government costs. We consider ex-ante social externalities, which capture the value of spillovers to parties other than the government and ex-ante fiscal externalities, which capture changes in government revenue beyond the direct cost of Medicaid coverage

$$EASE(\Omega) = \mathbb{E}[SE \mid \Omega] \quad \text{and} \quad EAFE(\Omega) = \mathbb{E}[FE \mid \Omega]\,, \tag{4}$$

where SE and FE are the corresponding ex-post social and fiscal externalities.

Per-Participant Surplus. Our preferred welfare measure is the ex-ante surplus from

Medicaid in states Ω relative to taxpaying states of the world:

$$\sigma(\Omega) = EAWTP(\Omega) - \frac{1}{g} ENC(\Omega), \tag{5}$$

where $ENC(\Omega) \equiv EAG(\Omega) - EAFE(\Omega) - EASE(\Omega)$ is the ex-ante net public cost of coverage – direct government spending net of the public and provider outlays that Medicaid displaces – and $1/g$ is the value delivered per dollar of government spending through the income tax and transfer system, where g is the "inverse-optimum weight" of Hendren (2020). The first term, $EAWTP(\Omega)$, is the ex-ante value of Medicaid coverage in Ω-states, measured in taxpaying-state dollars. The second term, $\frac{1}{g}ENC(\Omega)$, which we refer to as the cost-equivalent value, is the value of instead returning that cost through the tax and transfer system, in the taxpaying states where Medicaid is financed.[12] The difference, $\sigma(\Omega)$, is the value the government generates by providing Medicaid in Ω-states rather than returning its net cost to the taxpaying states that financed it. The surplus is positive if and only if Medicaid delivers more value in Ω-states than the individual would receive in taxpaying states from that cost-equivalent return.

4.3 Enrollment Regimes

We aggregate per-participant ex-ante surplus to evaluate two enrollment regimes. Let $\Omega_{VP} \equiv \{(X, \nu) : \nu \leq \psi(X, 1)\}$ denote the eligible states in which the individual participates voluntarily and $\Omega_{AP} \equiv \{(X, \nu) : \nu > \psi(X, 1)\}$ denote the set of states in which the individual participates only under automatic enrollment.[13] We evaluate each regime using per-eligible surplus. The per-eligible surplus under an enrollment regime is equal to the probability of participation multiplied by per-participant surplus. Let π_{VP} and π_{AP} denote the probabilities of Ω_{VP} and Ω_{AP} conditional on eligibility.

Voluntary Enrollment. Per-eligible surplus under voluntary enrollment is

$$s_{VE} = \pi_{VP} \cdot \sigma(\Omega_{VP}). \tag{6}$$

Per-eligible surplus under voluntary enrollment depends only on the value and cost of providing coverage to voluntary participants.

[12] Both the fiscal and social externalities enter at $1/g$. Both represent third-party funding of care that Medicaid displaces. We treat displaced third-party funding as a single quantity and do not assign different social values according to which residual payer bore this funding.

[13] For brevity, we refer to states in Ω_{VP} as voluntary participants and states in Ω_{AP} as auto-induced participants.

Automatic Enrollment. Per-eligible surplus under automatic enrollment depends on the value and cost of providing coverage to both voluntary and auto-induced participants

$$s_{AE} = \pi_{VP} \cdot \sigma(\Omega_{VP}) + \pi_{AP} \cdot \sigma(\Omega_{AP}). \tag{7}$$

Automatic enrollment increases per-eligible surplus, relative to voluntary enrollment, if and only if auto-induced per-participant surplus is positive – that is, if and only if $\sigma(\Omega_{AP}) > 0$.

Decomposition. The two regimes differ only in the surplus generated by auto-induced participants, $\sigma(\Omega_{AP})$. To understand what determines its sign, we decompose it into the surplus auto-induced participants would generate if they resembled voluntary participants, plus a series of terms that capture selection along each welfare-relevant dimension:

$$\sigma(\Omega_{AP}) = \underbrace{\sigma(\Omega_{VP})}_{\text{Mechanical}} + \underbrace{\overline{WTP} \cdot \Delta\mu}_{\text{Selection on Markup}} + \underbrace{\overline{\mu} \cdot \Delta WTP}_{\text{Selection on WTP}} + \Delta\text{Cov} - \underbrace{\tfrac{1}{g}\Delta ENC}_{\text{Selection on Cost}} \tag{8}$$

where $\overline{\mu}$ is the midpoint of $\mathbb{E}[\mu|\Omega_{VP}]$ and $\mathbb{E}[\mu|\Omega_{AP}]$, and $\overline{WTP}$ is the midpoint of $\mathbb{E}[WTP|\Omega_{VP}]$ and $\mathbb{E}[WTP|\Omega_{AP}]$. $\Delta\mu \equiv \mathbb{E}[\mu \mid \Omega_{AP}] - \mathbb{E}[\mu \mid \Omega_{VP}]$ and $\Delta WTP \equiv \mathbb{E}[WTP \mid \Omega_{AP}] - \mathbb{E}[WTP \mid \Omega_{VP}]$ capture differences in the mean redistributive markup and mean willingness to pay between auto-induced and voluntary participants, $\Delta ENC \equiv ENC(\Omega_{AP}) - ENC(\Omega_{VP})$ captures the difference in per-participant net cost, and $\Delta\text{Cov} \equiv \text{Cov}(\mu, WTP \mid \Omega_{AP}) - \text{Cov}(\mu, WTP \mid \Omega_{VP})$ captures the change in within-group covariance between the redistributive markup and willingness to pay.[14] The sign of $\sigma(\Omega_{AP})$ depends on whether the mechanical surplus is large enough to absorb the net selection effect.

4.4 Empirical Implementation

Marginal Utility. We model marginal utility as a power function of equivalized household consumption, $\lambda = c^{-\gamma}$ where γ is the coefficient of relative risk aversion.[15] Because the OHIE does not include a direct measure of consumption, we impute marginal utility for Medicaid participants and eligible non-participants from the Panel Study of Income Dynamics

[14] Because weighted value is the product of the redistributive markup and willingness to pay, the attribution of the change in weighted value to each component is not unique. In particular, the second-order term $\Delta\mu \cdot \Delta WTP$ will be split between the two first-order effects differently based on the initial point around which the Taylor expansion is taken. We choose here to expand around the midpoints, $\overline{\mu}$ and $\overline{WTP}$. This has the effect of splitting the second-order term equally between the two channels. We provide additional detail about this decomposition in Appendix B.

[15] Following the National Academy of Sciences (Citro and Michael, 1995), we construct equivalized consumption by dividing household consumption by the equivalence scale $e_h = (N_{h,\text{adult}} + 0.7N_{h,\text{child}})^{0.7}$, where $N_{h,\text{adult}}$ and $N_{h,\text{child}}$ denote the numbers of adults and children in household h. This equivalence scale provides a measure of the household's living standard that reflects economies of scale in consumption.

(PSID), based on a range of characteristics, most importantly Medicaid participation.[16] In the baseline analysis, we impose a consumption floor at the 5$^{\text{th}}$ percentile of the equivalized consumption distribution.[17] We measure the value of Medicaid coverage in taxpaying-state dollars. In the baseline analysis, we use Medicaid-ineligible individuals as a proxy for individuals with positive income-tax liability. We set the coefficient of relative risk aversion equal to two in the baseline analysis. The coefficient of relative risk aversion determines the level of the redistributive markup and is therefore a key determinant of how program value changes with enrollment. We report welfare estimates for $\gamma \in \{1, 2, 3\}$ in Appendix D.

Ex-Post Willingness to Pay. To first order, individual ex-post willingness to pay for Medicaid is equal to counterfactual without-Medicaid out-of-pocket health spending

$$WTP = oop_0. \tag{9}$$

This is the amount an individual would spend on medical care in the absence of Medicaid.[18] This measure captures only the financial protection value of Medicaid. It excludes any additional value from improved access to care or increased utilization that individuals may derive from coverage (Nyman, 1999; Finkelstein et al., 2019a; Acquatella and Marone, 2025). To the extent that Medicaid provides value beyond financial protection, our baseline measure understates the true willingness to pay and therefore understates the surplus generated by Medicaid. We assess robustness to alternative measures of willingness to pay that incorporate a share of the additional utilization induced by Medicaid in Appendix D.

Ex-Post Government Cost. The direct cost of Medicaid to the government is equal to individual with-Medicaid total health spending

$$G = care_1. \tag{10}$$

This measure captures the cost of medical care delivered to participants and does not include administrative costs associated with program operation.[19]

Ex-Post Externalities. We restrict attention to externalities that arise from uncompen-

[16] See Appendix A for a more detailed discussion of this imputation.

[17] The consumption floor protects against mis-measured low consumption values unduly affecting the results, given the sensitivity of marginal utility to low consumption under constant relative risk aversion.

[18] This first-order approximation follows from the envelope theorem under the assumption that individuals optimize given their budget constraint and that Medicaid affects individuals only through that constraint. See Appendix B for a derivation.

[19] Administrative costs likely differ across enrollment regimes – automatic enrollment would eliminate application processing costs but might introduce additional costs associated with verifying eligibility and managing a larger enrolled population.

sated care. Without Medicaid, individuals incur total medical spending $care_0$ of which they pay oop_0 out of pocket. The remainder, $care_0 - oop_0$, constitutes uncompensated care borne by both providers and the government. Medicaid displaces this uncompensated care, generating savings for providers (a social externality) and for the government (a fiscal externality). We assume that providers bear a fixed share $\phi \in [0, 1]$ of uncompensated care costs, which implies

$$SE = \phi(care_0 - oop_0) \quad \text{and} \quad FE = (1 - \phi)(care_0 - oop_0). \tag{11}$$

We set $\phi = 0.635$, following Garthwaite et al. (2018), who estimate that hospitals absorb between \$0.60 and \$0.67 in lost profits for every \$1 increase in uncompensated care costs.

Enrollment Regimes. The empirical objects defined above yield a simplification of per-participant surplus:

$$\sigma(\Omega) = \mathbb{E}[\mu \cdot oop_0 \mid \Omega] - \frac{1}{g}\,\mathbb{E}[care_1 - care_0 + oop_0 \mid \Omega]. \tag{12}$$

Therefore, surplus depends on four objects: the redistributive markup, without-Medicaid out-of-pocket spending, without-Medicaid total spending, and with-Medicaid total spending. These are the parameters whose variation with selection into Medicaid determines the welfare implications of expanding from voluntary to automatic enrollment.

4.5 Estimation

The estimation that follows recovers all four objects for voluntary participants and auto-induced participants. Doing so requires counterfactual without and with-Medicaid outcomes. The OHIE identifies these outcomes only for compliers – individuals whose Medicaid participation is shifted by the lottery.[20]

We address this challenge using marginal treatment response (MTR) functions (Heckman and Vytlacil, 1999; Mogstad et al., 2018). For each outcome, we specify the expected value of Y as a function of observed characteristics X and unobserved resistance to participation ν. The MTR functions are identified by combining the experimental variation from the lottery with the structure of the latent index participation model. For each value of X, the lottery generates two values of the propensity score – one for lottery winners and one for lottery losers – providing a pair of moment conditions. These moments, combined with parametric

[20] Kline and Walters (2016) show that complier outcomes alone would suffice to evaluate a marginal change in the probability of Medicaid participation, but not to evaluate Medicaid under a given enrollment regime.

restrictions on the MTR functions, identify the functions over the full support of ν. The welfare-relevant objects – expected outcomes for voluntary participants and for auto-induced participants – are then obtained by integrating the estimated MTR functions over X and the appropriate range of ν.

We parameterize the MTR functions following Brinch et al. (2017) and impose shape restrictions following Mogstad et al. (2018): the functions are additively separable in X and ν, linear in X, and specified with second-order Bernstein polynomial basis functions in a normalization of ν. We constrain out-of-pocket and total health spending to be non-negative and require with-Medicaid total spending to weakly exceed without-Medicaid total spending for all (X, ν), reflecting the assumption that Medicaid does not reduce total medical utilization. We further assume that the redistributive markup does not vary with treatment – that Medicaid does not affect a participant's consumption – so that the markup is a function of state alone.[21] The full specification is in Appendix B, and we assess sensitivity to each of these restrictions in Appendix D.

5 Results

We present our results in three steps. We first characterize how auto-induced and voluntary participants differ along each welfare-relevant dimension, quantifying the selection into Medicaid that the descriptive analysis could only sign. We then evaluate per-participant surplus for each group, which determines the surplus Medicaid generates under voluntary and automatic enrollment. Finally, we decompose per-participant surplus for auto-induced participants along each dimension of selection, which allows us to ask what an evaluation that accounted for selection on need alone would conclude about expanded enrollment.

5.1 Selection into Medicaid

Table 2 reports per-participant parameter estimates and welfare estimates for voluntary and auto-induced participants. The redistributive markup is 3.9 for voluntary participants and 2.7 for auto-induced participants. Without-Medicaid out-of-pocket spending is \$560 for voluntary participants and \$770 for auto-induced participants. These findings are consistent with the out-of-pocket–income gradient established in the descriptive analysis: voluntary participants exhibit higher need but lower out-of-pocket spending than auto-induced participants. We further find that both without- and with-Medicaid total spending are higher for

[21] This assumption is standard in welfare analyses of transfer programs (Deshpande and Lockwood, 2022; Rafkin et al., forthcoming).

voluntary participants ($3,680 and $4,610) than for auto-induced participants ($2,610 and $3,500), reflecting greater medical utilization among needier individuals.

The two margins move in opposite directions, and the value of Medicaid consequently declines much less than selection on need alone would suggest. The ex-ante value for Medicaid ($EAWTP$) falls from $2,110 for voluntary participants to $2,000 for auto-induced participants. Evaluating surplus also requires the cost-equivalent value of coverage – what participants would receive were the net cost of their coverage instead returned through the tax and transfer system. The cost-equivalent value is modestly higher for auto-induced participants ($1,760) than for voluntary participants ($1,580), despite their lower total medical spending. Voluntary participants' lower out-of-pocket spending means a larger share of their without-Medicaid care constitutes uncompensated care borne by providers and the government. When Medicaid covers these individuals, it substitutes for that uncompensated care, generating savings that reduce the net cost to the government. Auto-induced participants bear more of their costs out of pocket, so covering them displaces less uncompensated care and yields smaller savings. Altogether, per-participant surplus is $530 for voluntary participants and $240 for auto-induced participants. For both groups, Medicaid delivers more value than a cost-equivalent tax cut, so per-participant surplus is positive.

5.2 Voluntary vs. Automatic Enrollment

Table 3 compares the two enrollment regimes from the perspective of an individual who is eligible for Medicaid. Under voluntary enrollment, the expected willingness to pay is $280. Under automatic enrollment, the expected willingness to pay is $660. The increase in willingness to pay is due, overwhelmingly, to increased program participation. We find that the ex-ante value of Medicaid rises from $1,060 to $2,060. The cost-equivalent value also rises from $790 to $1,670. Therefore, surplus rises from $270 to $390. That automatic enrollment increases surplus follows directly from the fact that per-participant surplus is positive for auto-induced participants.

5.3 Decomposition

Our results show that automatic enrollment increases surplus despite extending coverage to individuals with substantially less financial need. This finding reflects two opposing selection patterns: advantageous selection on need reduces surplus and disadvantageous selection on willingness to pay raises it. The decomposition below quantifies the contribution of each margin to the surplus generated by automatic enrollment.

Table 4 decomposes per-participant surplus for auto-induced participants into a mechanical component and a selection component. The mechanical component is $530, equal to per-participant surplus for voluntary participants: the surplus auto-induced participants would generate if they were identical to voluntary participants. We focus our attention on the selection component. Selection on the redistributive markup reduces per-participant surplus by $790 while selection on willingness to pay raises per-participant surplus by $680. Although the willingness-to-pay channel is smaller in magnitude, it is decisive for the sign: absent it, auto-induced participants would generate −$440 per participant, and automatic enrollment would reduce the surplus generated by Medicaid.

5.4 Policy Implications

Our results show that selection into Medicaid operates on two margins that move in opposite directions, and that the disadvantageous selection on willingness to pay is strong enough to overturn the presumption that expanding enrollment would lower the value of the program. These findings bear on several of the central questions in the debate over means-tested coverage.

Does automatic enrollment decrease the surplus generated by Medicaid? No. The concern that automatic enrollment might lower the surplus generated by Medicaid rests on a real pattern: as we show, auto-induced participants exhibit less financial need than voluntary participants. But these auto-induced participants also exhibit greater willingness to pay for coverage, because they face higher without-Medicaid out-of-pocket medical spending. We show quantitatively that this disadvantageous selection on willingness-to-pay offsets the advantageous selection on need such that automatic enrollment increases the surplus generated by Medicaid.

This conclusion comes with a caveat. Auto-induced participants generate positive surplus, but considerably less than voluntary participants. The marginal value of public funds (MVPF) – which, following Finkelstein et al. (2019a), counts the provider share of displaced uncompensated care as a benefit rather than a reduction in cost – is therefore lower for auto-induced participants (1.08) than for voluntary participants (1.14), so the MVPF of the program falls slightly as enrollment expands, from 1.14 under voluntary enrollment to 1.12 under automatic enrollment (Appendix Table D.8). What falls is not the surplus but the rate at which each additional dollar of public spending converts into it.

Can targeted automatic enrollment do better than blanket automatic enrollment? Potentially yes. Because the redistributive markup and willingness to pay vary

systematically with observable characteristics, the surplus generated by expanding enrollment depends on *which* eligible non-participants are induced to participate. We use our framework to evaluate targeted expansions that auto-enroll specific subpopulations rather than the eligible population as a whole. Appendix Table D.8 considers several such policies: auto-enrolling individuals who speak a language other than English, who live in rural areas, or who already receive SNAP or TANF.[22] Each targeted expansion produces a different combination of participation, value, and cost. We find that auto-enrolling eligible non-participants who already receive SNAP or TANF generates more surplus than blanket auto-enrollment: among non-participants, this group combines a high redistributive markup with willingness to pay that does not fall correspondingly, weakening the negative relationship between need and willingness to pay that holds across eligible individuals generally.

Is Medicaid, under either voluntary or automatic enrollment, the most cost-effective way to deliver value to recipients? Likely no. That Medicaid delivers more value than a cost-equivalent tax cut delivered in taxpaying states, under both regimes, does not imply that an equivalent expenditure could not deliver more. The reason is the same one that drives our main results: eligible individuals already receive partial insurance in the form of uncompensated care, and Medicaid is largely a substitute for this insurance. This has two consequences. First, it lowers the value of coverage relative to its cost. Because eligible individuals pay only a fraction of their medical costs out of pocket, the financial protection Medicaid provides is well below the spending it finances. The care Medicaid induces does not close the gap. Revealed preference suggests that any care induced by Medicaid is worth little: recipients declined it when facing only their out-of-pocket share of the price, which was itself a small fraction of the cost of care. Second, Medicaid directs resources away from the states in which these resources are worth the most. Uncompensated care is most available to the poorest eligible individuals, who have the highest marginal utility of consumption, so willingness to pay for coverage is lowest precisely where the redistributive markup is highest. Medicaid delivers its largest ex-post transfers to recipients whose dollars are worth least, which lowers $EAWTP$ below what the same expenditure would achieve if its incidence were flat or progressive.

Neither point implies that Medicaid is worth less than a cost-equivalent return through the tax and transfer system – our estimates say it is not, under either regime. Instead, they imply that Medicaid likely delivers less surplus than alternatives whose value is not eroded by the insurance participants implicitly hold.

[22] We consider these characteristics because they are observed at baseline in the OHIE and would plausibly be available to an administrator designing an enrollment rule. They are not intended as an exhaustive set of targeting margins.

6 Conclusion

Debates over in-kind transfer programs often turn on a tension between reach and targeting. Expanding enrollment draws in eligible individuals who are less needy than those who participate voluntarily, and thereby potentially reduces the net value of the program. We study this tension in Medicaid, where the argument, though grounded in a real pattern of selection, is incomplete. Selection on need raises the value of the program by directing transfers toward those who need them most. But the neediest also have the greatest access to uncompensated care, such that they exhibit lower willingness to pay for Medicaid. The second force offsets the first such that automatic enrollment would increase the value of Medicaid.

This tradeoff between need and willingness to pay is likely not specific to Medicaid. It rests on two conditions. First, eligible individuals must self-select into the program on the basis of need, so that voluntary participants are needier than non-participants. Second, absent the program, spending on the covered good must decline with need, as it would if the good is normal or if higher-need individuals have greater access to other sources of the good. Willingness to pay for the program then also declines with need. Wherever both conditions hold, the choice between voluntary and automatic enrollment turns on two margins rather than one. The relevant question is not whether automatically enrolled individuals are less needy than voluntary participants (under these conditions they will be) but how much their higher willingness to pay offsets their lower need.

References

Acquatella, Angelique and Victoria Marone, "The Risk Protection Value of Moral Hazard," 2025. Working paper.

Bhargava, Saurabh and Dayanand Manoli, "Psychological Frictions and the Incomplete Take-Up of Social Benefits: Evidence from an IRS Field Experiment," *American Economic Review*, 2015, *105* (11), 3489–3529.

Brinch, Christian N., Magne Mogstad, and Matthew Wiswall, "Beyond LATE with a Discrete Instrument," *Journal of Political Economy*, 2017, *125* (4), 985–1039.

Citro, Constance F. and Robert T. Michael, *Measuring Poverty: A New Approach*, Washington, DC: National Academy Press, 1995.

Deshpande, Manasi and Lee M. Lockwood, "Beyond Health: Nonhealth Risk and the Value of Disability Insurance," *Econometrica*, 2022, *90* (4), 1781–1810.

_ **and Yue Li**, "Who Is Screened Out? Application Costs and the Targeting of Disability Programs," *American Economic Journal: Economic Policy*, 2019, *11* (4), 213–248.

Finkelstein, Amy, Nathaniel Hendren, and Erzo F. P. Luttmer, "The Value of Medicaid: Interpreting Results from the Oregon Health Insurance Experiment," *Journal of Political Economy*, 2019, *127* (6), 2836–2874.

_ , _ , **and Mark Shepard**, "Subsidizing Health Insurance for Low-Income Adults: Evidence from Massachusetts," *American Economic Review*, 2019, *109* (4), 1530–1567.

_ , **Sarah Taubman, Bill Wright, Mira Bernstein, Jonathan Gruber, Joseph P. Newhouse, Heidi Allen, and Katherine Baicker**, "The Oregon Health Insurance Experiment: Evidence from the First Year," *Quarterly Journal of Economics*, 2012, *127* (3), 1057–1106.

Garthwaite, Craig L., Tal Gross, and Matthew J. Notowidigdo, "Hospitals as Insurers of Last Resort," *American Economic Journal: Applied Economics*, 2018, *10* (1), 1–39.

Heckman, James J. and Edward J. Vytlacil, "Local Instrumental Variables and Latent Variable Models for Identifying and Bounding Treatment Effects," *Proceedings of the National Academy of Sciences*, 1999, *96* (8), 4730–4734.

Hendren, Nathaniel, "Measuring Economic Efficiency Using Inverse-Optimum Weights," *Journal of Public Economics*, 2020, *187*, 104198.

Homonoff, Tatiana and Jason Somerville, "Program Recertification Costs: Evidence from SNAP," *American Economic Journal: Economic Policy*, 2021, *13* (4), 271–298.

Kline, Patrick and Christopher R. Walters, "Evaluating Public Programs with Close Substitutes: The Case of Head Start," *Quarterly Journal of Economics*, 2016, *131* (4), 1795–1848.

Kowalski, Amanda E., "Reconciling Seemingly Contradictory Results from the Oregon Health Insurance Experiment and the Massachusetts Health Reform," *Review of Economics and Statistics*, 2023, *105* (3), 646–664.

Lieber, Ethan M. J. and Lee M. Lockwood, "Targeting with In-Kind Transfers: Evidence from Medicaid Home Care," *American Economic Review*, 2019, *109* (4), 1461–1485.

Lockwood, Lee M., "Health Insurance and Consumption Risk," *Review of Economics and Statistics*, forthcoming.

Mahoney, Neale, "Bankruptcy as Implicit Health Insurance," *American Economic Review*, 2015, *105* (2), 710–746.

Mogstad, Magne, Andres Santos, and Alexander Torgovitsky, "Using Instrumental Variables for Inference about Policy Relevant Treatment Parameters," *Econometrica*, 2018, *86* (5), 1589–1619.

Nichols, Albert L. and Richard J. Zeckhauser, "Targeting Transfers through Restrictions on Recipients," *American Economic Review*, 1982, *72* (2), 372–377.

Nyman, John A., "The Value of Health Insurance: The Access Motive," *Journal of Health Economics*, 1999, *18* (2), 141–152.

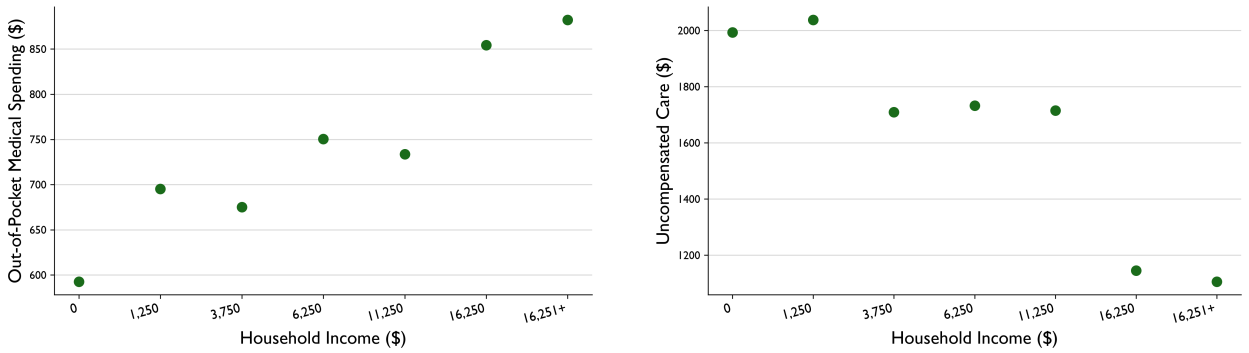
Rafkin, Charlie, Adam Solomon, and Evan Soltas, "Self-Targeting in U.S. Transfer Programs," *Journal of Political Economy*, forthcoming.

Shepard, Mark and Myles Wagner, "Do Ordeals Work for Selection Markets? Evidence from Health Insurance Auto-Enrollment," *American Economic Review*, 2025, *115* (3), 772–822.

Vytlacil, Edward J., "Independence, Monotonicity, and Latent Index Models: An Equivalence Result," *Econometrica*, 2002, *70* (1), 331–341.

Wu, Derek and Bruce D. Meyer, "Certification and Recertification in Welfare Programs: What Happens When Automation Goes Wrong?," *American Economic Journal: Economic Policy*, forthcoming.

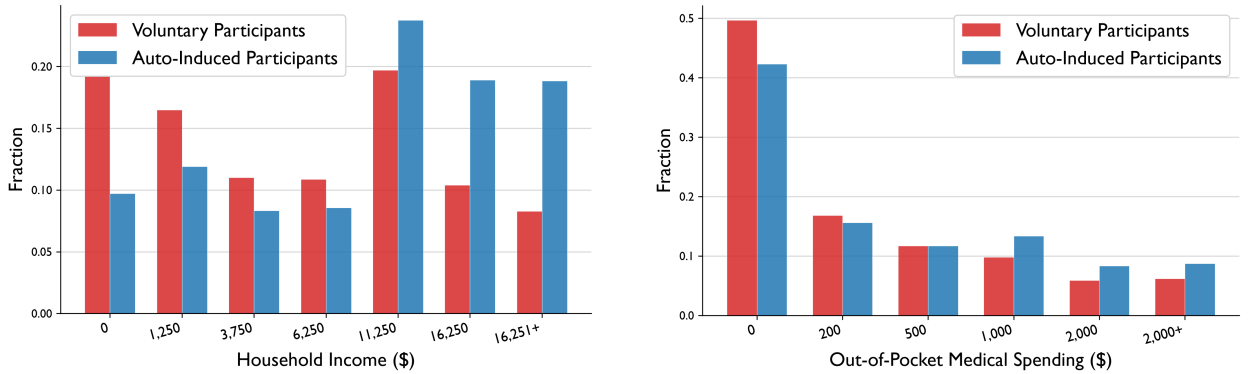
Tables & Figures



(a) Out-of-Pocket Medical Spending by Household Income

(b) Uncompensated Care by Household Income

Figure 1 – **Finding 1: Out-of-pocket medical spending is increasing in household income; uncompensated care is decreasing in household income.** *Notes*: Binned scatter plots of mean out-of-pocket medical spending by household income bin and mean uncompensated care, the difference between total health spending and out-of-pocket medical spending, by household income, restricted to individuals with household income below 150% of the Federal Poverty Line. Both total health spending and out-of-pocket medical spending are measured at the 0-month survey.



(a) Household Income (by Take-Up)

(b) Out-of-Pocket Medical Spending (by Take-Up)

Figure 2 – **Finding 2: Voluntary participants have lower income and lower out-of-pocket medical spending than auto-induced participants.** *Notes*: Histogram of household income and out-of-pocket medical spending, separately for voluntary participants ($Z = 1, D = 1$) and auto-induced participants ($Z = 1, D = 0$), restricted to individuals with household income below 150% of the Federal Poverty Line. Both household income and out-of-pocket medical spending are measured at the 0-month survey.

Table 1: External Validity

	OHIE		PSID	
	Voluntary Participants	Auto-Induced Participants	Voluntary Participants	Auto-Induced Participants
Panel A: Demographics				
Share white	0.847	0.825	0.554	0.665
Share female	0.613	0.618	0.649	0.536
Share age 50 or older	0.272	0.285	0.316	0.332
Household size	2.79	2.93	2.94	2.82
Panel B: Financial Need and Out-of-Pocket Exposure				
Household income ($)	6,573	10,490	13,069	14,516
Consumption ($)	–	–	18,927	26,194
Out-of-pocket medical spending ($)	658	825	410	713
Observations	3,375	3,144	2,547	14,506

Notes: Pre-coverage characteristics of Medicaid-eligible individuals by subsequent participation. The OHIE data are lottery winners ($Z = 1$) with household income below 150% of the Federal Poverty Line, measured at the 0-month survey and split by Medicaid participation ($D = 1$, voluntary participants; $D = 0$, auto-induced participants). The PSID data are household heads aged 19–64 with household income below 150% of the Federal Poverty Line who are not enrolled in Medicaid in survey wave t, split by Medicaid enrollment in wave $t+1$ (two years later); characteristics are measured in wave t. PSID waves 1999–2019, weighted by family weight. Out-of-pocket medical spending is annualized and excludes prescription drugs: in the OHIE, it is reported spending on medical care over the previous six months and then doubled; in the PSID, it is spending on hospital and nursing home care, doctor visits, outpatient surgery, and dental care in the prior calendar year. In both, out-of-pocket spending above twice the 99th percentile is set to missing. Dollar amounts are in 2009 dollars.

Table 2: Per-Participant Value, Cost, and Surplus by Group

	Voluntary Participants	Auto-Induced Participants	Difference
Panel A: Parameter Estimates			
Redistributive Markup	3.85 (0.01)	2.66 (0.02)	−1.19 (0.03)
Without-Medicaid Out-of-Pocket Spending	557 (61)	766 (36)	209 (78)
Without-Medicaid Total Spending	3,683 (228)	2,606 (107)	−1,077 (271)
With-Medicaid Total Spending	4,612 (162)	3,497 (327)	−1,115 (265)
Panel B: Welfare Estimates			
Ex-Ante Value	2,113 (240)	2,002 (98)	−111 (276)
Redistributive Markup	3.85 (0.01)	2.66 (0.02)	−1.19 (0.03)
Willingness to Pay	557 (61)	766 (36)	209 (78)
Cost-Equivalent Value	1,578 (322)	1,761 (304)	183 (107)
Per-Participant Surplus	534 (386)	241 (311)	−294 (215)

Notes: Per-participant parameter estimates and welfare estimates for voluntary and auto-induced Medicaid participants. Voluntary participants are always-takers and compliers; auto-induced participants are never-takers. The sample is restricted to individuals with household income below 150% of the Federal Poverty Line. Ex-ante value equals $\mathbb{E}[\mu \cdot WTP \mid \Omega]$. Net government cost equals $\mathbb{E}[care_1 - care_0 + oop_0 \mid \Omega]$; cost-equivalent value equals net government cost divided by g, the inverse-optimum weight. Per-participant surplus equals ex-ante value less cost-equivalent value. Bootstrapped standard errors in parentheses.

Table 3: Per-Eligible Welfare Under Voluntary vs. Automatic Enrollment

	Voluntary Enrollment	Automatic Enrollment	Difference
Panel A: Parameter Estimates			
Redistributive Markup	3.85 (0.01)	3.26 (0.01)	−0.59 (0.02)
Without-Medicaid Out-of-Pocket Spending	557 (61)	661 (31)	105 (39)
Without-Medicaid Total Spending	3,683 (228)	3,145 (116)	−538 (134)
With-Medicaid Total Spending	4,612 (162)	4,055 (221)	−557 (131)
Panel B: Welfare Estimates			
Ex-Ante Value	1,058 (121)	2,057 (120)	1,000 (54)
Willingness to Pay	279 (31)	661 (31)	383 (19)
Cost-Equivalent Value	790 (160)	1,670 (309)	879 (156)
Per-Eligible Surplus	267 (193)	388 (334)	120 (155)
Participation Share	0.50	1.00	

Notes: Parameter estimates and welfare estimates under voluntary and automatic enrollment. Panel A reports participation-weighted average primitives for participants under each regime. Panel B reports per-eligible welfare estimates, where each object is scaled by the participation share π. Ex-ante value equals $\pi \cdot \mathbb{E}[\mu \cdot WTP \mid \Omega]$. Net government cost equals $\pi \cdot \mathbb{E}[care_1 - care_0 + oop_0 \mid \Omega]$; cost-equivalent value equals net government cost divided by g, the inverse-optimum weight. Per-eligible surplus equals $\pi \cdot \sigma(\Omega)$. Bootstrapped standard errors in parentheses.

Table 4: Decomposition of Auto-Induced Per-Participant Surplus

	Per-Participant Surplus
Mechanical (Voluntary Participant Surplus)	534 (386)
Selection	−294 (215)
Selection on Redistributive Markup	−786 (43)
Selection on Willingness to Pay	682 (253)
Selection on Covariance	−7 (8)
Selection on Cost	−183 (107)
Auto-Induced Participant Surplus	241 (311)
Absent Selection on Willingness to Pay	−441 (391)

Notes: Decomposition of per-participant surplus for auto-induced participants following equation (8). The mechanical component equals per-participant surplus for voluntary participants. The selection component is decomposed into contributions from the redistributive markup, willingness to pay, within-group covariance, and cost-equivalent value. The final row reports auto-induced surplus absent the willingness-to-pay channel, i.e., auto-induced surplus less the selection-on-willingness-to-pay term. Bootstrapped standard errors in parentheses.

Appendices for Online Publication

A: Data

B: Theory

C: Additional Descriptive Figures & Tables

D: Additional Welfare Figures & Tables

A Data Appendix

A.1 Oregon Health Insurance Experiment (OHIE)

In 2008, the state of Oregon conducted a lottery for the opportunity to apply for the Oregon Health Plan (OHP) Standard, a Medicaid expansion program for low-income adults otherwise ineligible for public insurance. Eight lottery drawings took place from March to September 2008; those selected were offered the opportunity to apply for OHP Standard coverage for themselves and their household members. The data include information collected from a lottery request form at registration, matched state administrative records on program participation, a survey fielded between June and November 2008, shortly after randomization (the initial survey), and a follow-up survey mailed in seven waves in July and August 2009, approximately one year after the lottery drawings (the one-year survey).[23] The probability of treatment differs by the number of household members who entered the lottery, and the probability of being sampled for the one-year survey differs by survey wave. We restrict all analyses to individuals who were the only member of their household to enter the lottery. The welfare analysis weights observations by the one-year survey weights, and the propensity score and the MTR functions include indicators for one-year survey wave.

Samples and Eligibility. The descriptive analysis (Section 3) uses respondents to the initial survey, with eligibility, household income, and spending measured in the initial survey. The welfare analysis (Sections 4) uses respondents to the one-year survey with a positive survey weight and non-missing participation, total medical spending, out-of-pocket spending, and covariates, with eligibility measured using household income reported in the one-year survey. In both cases, the baseline sample consists of individuals with household income below 150% of the Federal Poverty Line.

Participation. Medicaid participation D is an indicator for enrollment in any OHP program (OHP Standard or OHP Plus) at any point between the individual's lottery notification date and September 30, 2009, from state administrative records.

Covariates. The covariates are drawn from three sources. From the lottery request form completed at registration, we use indicators for female sex, age 50 or older, metropolitan area (defined by whether the individual's ZIP code falls within a census-defined metropolitan statistical area), and non-English language preference. From state administrative records matched to lottery registrants, we use indicators for SNAP receipt and TANF receipt prior

[23] Responses to the one-year survey were collected through March 2010.

to lottery notification. From the surveys, we use self-reported race and the number of adults and children in the household, where household size is capped at 20, children are capped at household size minus one, and the number of adults is defined as the residual. The welfare analysis takes race and household composition from the one-year survey; the descriptive analysis takes them from the initial survey. The propensity score and the MTR functions condition on the indicators for white, female, age 50 or older, SNAP receipt, TANF receipt, metropolitan area, non-English language preference, and one-year survey wave. Household composition enters only the imputation of marginal utility (Appendix A.2), as indicators for one, two, and three or more children and for two, three, and four or more adults.

Out-of-Pocket Medical Spending. Both surveys ask about out-of-pocket spending over the prior six months. In the initial survey, we use reported out-of-pocket spending on medical care excluding prescription drugs, so that it pairs with the measure of total medical spending excluding prescription drugs used in the descriptive analysis.[24] In the one-year survey, we use the total out-of-pocket spending question, which covers doctor visits, emergency room visits, prescription drugs, and other care. In both surveys, responses below zero or above twice the 99th percentile are set to missing, and the remaining responses are doubled to annualize. We additionally construct the out-of-pocket price as the ratio of annualized out-of-pocket spending to annualized total medical spending for individuals with positive total spending.

Total Medical Spending. Total medical spending is constructed from survey-reported utilization combined with average per-unit spending estimates from the 2002–2007 Medical Expenditure Panel Survey (MEPS) for non-elderly adults (ages 19–64) living below 100% of the Federal Poverty Line and covered by public insurance (Finkelstein et al., 2012). Both surveys record the number of outpatient doctor visits, emergency room visits, and hospital stays over the prior six months and the number of current prescription medications; the corresponding MEPS unit costs are \$150 per doctor visit, \$435 per emergency room visit, \$7,523 per hospital stay, and \$156 of six-month spending per prescription. Utilization counts are truncated at twice the 99th percentile, the product of counts and unit costs is summed across categories, and the sum is doubled to annualize; total spending is missing if any included category is missing. The welfare analysis uses all four categories, matching the one-year out-of-pocket measure, which includes prescription drugs. The descriptive analysis excludes prescription drugs, matching the initial-survey out-of-pocket measure.

[24] The initial survey also records out-of-pocket spending on prescription drugs, asked as a monthly amount, and a total that includes them.

A.2 Panel Study of Income Dynamics (PSID)

The Panel Study of Income Dynamics (PSID) is a longitudinal sfurvey of U.S. families conducted biennially since 1997. We use interview waves from 1999 to 2019, corresponding to income and expenditure data for calendar years 1998 to 2018. Each observation is an adult in a survey wave: we keep household heads and their spouses or long-term cohabiting partners, each with their own sex, age, race, and Medicaid status, and with household-level income, consumption, size, location, and program receipt shared within the household. The PSID provides measures of non-medical consumption that the OHIE does not collect, which we use to impute the marginal utility of consumption for the OHIE population.

Eligibility and Sample Restrictions. We construct Medicaid eligibility proxies using total household income relative to Federal Poverty Line (FPL) thresholds, restricting to non-elderly adults aged 19 to 64. Total household income is the sum of labor income (earnings of the head and spouse), unearned income (Social Security, unemployment compensation, workers' compensation, child support, alimony, rent, dividends, interest, trust income, veterans' pensions, IRAs, retirement and other pensions, and miscellaneous income), and transfer income (TANF, SSI, other welfare, help from relatives, and help from others). All income components are bottom-coded at zero and top-coded at the 99th percentile. FPL thresholds are merged by calendar year, household size (capped at 9), and state of residence, with separate thresholds for Alaska, Hawaii, and the contiguous United States. Our baseline specification treats adults with household income at or below 150% of the FPL as eligible, to match our baseline OHIE income eligibility criterion. Medicaid enrollment is identified from health insurance type questions, which vary in reference period across survey waves: coverage at any point in the past two years (1999–2009 waves) and current coverage (2011–2019 waves). We require non-missing values for Medicaid enrollment, family weight, total expenditure, and all covariates used in the imputation. All statistics use PSID family weights.

Covariates. The PSID analogues of the OHIE covariates are indicators for white (the adult's own race), female, age 50 or older, household SNAP receipt and TANF receipt in the survey wave, residence in a metropolitan county (Beale codes 1–4), and an interview conducted in a language other than English, together with the household-composition indicators described in Appendix A.

Consumption. Household consumption is built from six expenditure categories: food, housing, transportation, education, child care, and health care. Each component is bottom-coded at zero and top-coded at its 99th percentile within each survey wave. Our base-

line measure is non-health consumption, the sum of the first five categories. All expenditure variables are deflated to 2009 dollars using the Personal Consumption Expenditures Price Index (PCEPI). Consumption is equivalized by dividing by the equivalence scale $e_h = (N_{h,\text{adult}} + 0.7N_{h,\text{child}})^{0.7}$, where $N_{h,\text{adult}}$ and $N_{h,\text{child}}$ denote the numbers of adults and children in household h (Citro and Michael, 1995).

Marginal Utility and the Redistributive Markup. We compute marginal utility separately within each survey wave. In each wave, the consumption floor is the family-weighted 5th percentile of equivalized consumption among adults aged 19 to 64 in the baseline specification, and marginal utility is equivalized consumption, bounded below by the floor, raised to the power $-\gamma$. We normalize marginal utility by its family-weighted mean in the same wave among the taxpayer reference group, adults aged 19 to 64 with household income above 150% of the FPL. The result is the redistributive markup μ for each PSID adult.

Imputation of the Redistributive Markup. To impute the markup for each OHIE respondent, we use PSID adults below the eligibility threshold (150% of the FPL in the baseline specification) who are not enrolled in Medicaid in wave t and are observed again in wave $t + 1$, two years later. We estimate a family-weighted Poisson pseudo-maximum likelihood regression of the markup on the covariates, an indicator for Medicaid enrollment in wave $t + 1$, and the interactions of every covariate with that indicator, so that $E[\mu \mid X, D] = \exp(X'\beta + D \cdot X'\delta)$. Because the markup is measured in wave t, before enrollment, the regression recovers how pre-coverage marginal utility varies with subsequent take-up, which mirrors the comparison of voluntary participants and non-participants in the OHIE. We then predict the markup for each OHIE respondent from their covariates and Medicaid participation D. Because the Poisson model is for the conditional mean of the markup itself, no retransformation is needed, and because the PSID markups are bounded by the floor, so are the predictions.

Inverse-Optimum Weight. Within each wave, we rank every adult by household income, using family weights, and assign the inverse-optimum weight that Hendren (2020) reports for that income percentile. The inverse-optimum weight g is the family-weighted average of these weights over the taxpayer reference group.

B Theory

B.1 Willingness To Pay

We derive our measure of willingness to pay following Finkelstein et al. (2019). Consider an individual who chooses consumption c and medical spending m to maximize utility $u(c, m)$ subject to the budget constraint

$$c + p(b)m = y,$$

where y is income and $p(b)$ is the out-of-pocket price of medical care under Medicaid coverage $b \in \{0, 1\}$. We assume $p(1) = 0$: Medicaid eliminates cost-sharing, consistent with OHP Standard coverage in the OHIE.

Let $V(b)$ denote indirect utility. By the envelope theorem,

$$\frac{\partial V}{\partial b} = -\lambda \cdot \frac{dp}{db} \cdot m(b), \tag{13}$$

where λ is the marginal utility of income. Dividing by λ and integrating the price change from $p(0)$ to $p(1) = 0$ gives willingness to pay as the area under the demand curve for medical care,

$$WTP = \int_0^{p(0)} m(p)\, dp.$$

We approximate this area using utilization at the price endpoints, $m(0)$ and $m(1)$, and index the approximation by a parameter $\alpha \in [0, 1]$ on the share of induced utilization that is welfare-relevant

$$WTP(\alpha) = p(0)\left[m(0) + \alpha\left(m(1) - m(0)\right)\right].$$

The first term, $p(0)m(0) = oop_0$, is participants' value for financial protection on the care they would have consumed without Medicaid. The second term, $\alpha\left(m(1) - m(0)\right)$ is the share α that participants' value for induced care due to Medicaid.

We consider three cases. In the baseline analysis, we set $\alpha = 0$, such that willingness to pay equals oop_0. This excludes any value from induced utilization, and to the extent that additional care is valuable, it understates willingness to pay and therefore understates the surplus from coverage. In the robustness analysis we set $\alpha = 0.5$ which recovers the trapezoidal approximation (Kleven (2021)), $\frac{1}{2}p(0)\left[m(0) + m(1)\right]$ and assumes that participants'

value for induced care at the average of the with- and without-Medicaid prices and set $\alpha = 1$ which assumes that participants value all induced care at the full without-Medicaid price, $p(0)\,m(1)$, an upper extreme that credits every induced unit at the most the individual would have paid for any of them.

B.2 Extensive Margin Compliers

We define treatment as an indicator for Medicaid participation, $D \in \{0, 1\}$, where $D = 1$ denotes participation at the time of measurement. This binary definition abstracts from variation in the duration or intensity of Medicaid coverage. In practice, individuals may experience different lengths of coverage, and the lottery primarily shifts the timing and likelihood of enrollment rather than assigning permanent treatment. As a result, some individuals who do not enroll following the lottery may enroll later, and some who enroll may differ in the duration of coverage they receive.

Our analysis focuses on outcomes measured approximately one year after randomization, which mitigates concerns about long-run differences in treatment duration and aligns the treatment definition with the timing of observed outcomes. To interpret the treatment effect and the marginal treatment response framework, it is useful to consider a simplifying assumption that the lottery primarily induces participation on the extensive margin. Specifically, we assume that individuals induced into Medicaid by the lottery are individuals who would not have participated otherwise:

$$D(1) > D(0) \implies D(0) = 0.$$

Under this assumption, the instrument shifts individuals from non-participation to participation, rather than increasing the intensity or duration of participation among individuals who would already receive some coverage. This assumption simplifies the interpretation of the marginal treatment response framework by allowing the unobserved resistance to treatment, ν, to capture variation in the decision to participate, without separately modeling variation in treatment intensity. In particular, we assume that mean potential outcomes depend only on the extensive margin unobservable:

$$E[Y \mid \nu, X],$$

and not on additional unobserved determinants of treatment intensity. While this abstraction ignores potential variation in the duration of coverage, it is standard in analyses of the

Oregon Health Insurance Experiment and is supported by the short-run focus of the outcome measures (Rose and Shem-Tov (forthcoming)). To the extent that the lottery primarily affects the timing of enrollment rather than long-run coverage status, this assumption provides a reasonable approximation for the purposes of our welfare analysis.

B.3 Marginal Treatment Effect Estimation

Our marginal treatment effect (MTE) and marginal treatment response (MTR) estimation follows Brinch et al. (2017) and Mogstad et al. (2018). We begin with a latent index model of Medicaid participation. Let ν_i denote an individual's unobserved resistance to treatment, which we assume is distributed $\nu_i \sim N(0,1)$ and independent of the instrument Z_i conditional on observed characteristics X_i. Treatment status is determined by the threshold-crossing rule

$$D_i = \mathbf{1}\{\nu_i \leq \psi(X_i, Z_i)\},$$

where $\psi(X_i, Z_i)$ is a propensity index that depends on observables and the instrument. We estimate the propensity score $\pi(X_i, Z_i) = \Phi(\psi(X_i, Z_i))$ by a probit of D_i on Z_i and X_i, weighted by the one-year survey weights.

We assume the instrument satisfies relevance and exclusion: it shifts participation through $\psi(X_i, Z_i)$, but does not directly affect potential outcomes. Potential outcomes are given by

$$E[Y_i(d) \mid X_i, \nu_i] = m_d(X_i, \nu_i), \quad d \in \{0, 1\},$$

where m_0 and m_1 are the MTR functions. These functions characterize how expected outcomes vary with both observed characteristics and unobserved resistance to treatment, and imply the marginal treatment effect

$$MTE(X_i, \nu_i) = m_1(X_i, \nu_i) - m_0(X_i, \nu_i).$$

This structure delivers a set of moment conditions that link the unobserved MTR functions to observable data. Let $\phi(\cdot)$ denote the standard normal density and $\Phi(\cdot)$ its CDF. Then the observed conditional means of outcomes for treated and untreated individuals can be

written as truncated expectations over ν_i:

$$E[Y_i \mid D_i = 1, X_i, Z_i] = \frac{1}{\pi(X_i, Z_i)} \int_{-\infty}^{\psi(X_i, Z_i)} m_1(X_i, \nu)\, \phi(\nu)\, d\nu,$$
$$E[Y_i \mid D_i = 0, X_i, Z_i] = \frac{1}{1 - \pi(X_i, Z_i)} \int_{\psi(X_i, Z_i)}^{\infty} m_0(X_i, \nu)\, \phi(\nu)\, d\nu.$$

The MTR functions m_0 and m_1 are then identified by requiring that they reproduce these observable moments across values of X_i and Z_i. We impose additive separability between observables and unobservables in the MTR functions:

$$m_d(X_i, \nu_i) = X_i' \beta_d + K_d(\nu_i).$$

This assumption implies that unobserved resistance affects outcomes through a common function K_d that does not vary with X_i. We flexibly parameterize the K_d functions with Bernstein polynomials on the normalization $u = \Phi(\nu)$:

$$K_d(\nu) = \sum_{j=0}^{n} \alpha_{dj} \binom{n}{j} \Phi(\nu)^j \big(1 - \Phi(\nu)\big)^{n-j}.$$

In our baseline specification we estimate Bernstein polynomials of order $n = 2$; we explore $n = 3$ and $n = 4$ in Appendix Table D.5.

We estimate the parameters by constrained weighted least squares, fitting the MTR functions to the survey-weighted mean outcomes in each cell defined by D, Z, and X, with each cell weighted by its total survey weight. The constraints are the shape restrictions in Section 4.5: out-of-pocket and total health spending are non-negative; with-Medicaid total spending weakly exceeds without-Medicaid total spending for all (X, ν); and each MTR function is monotonic in ν, with without-Medicaid out-of-pocket spending increasing in ν and without- and with-Medicaid total spending and the redistributive markup decreasing in ν. Appendix Tables D.6 and D.7 relax the last two restrictions. Ex-ante value requires $E[\mu \cdot oop_0 \mid \Omega]$. In the baseline analysis, we compute it as the product of the separately estimated MTR functions for μ and oop_0, which imposes $\mathrm{Cov}(\mu, oop_0 \mid X, \nu) = 0$.

B.4 Decomposition

We are interested in decomposing the change in the function $f(\Omega) \equiv \mathbb{E}[WTP|\Omega]\mathbb{E}[\mu|\Omega]$ as Ω moves from Ω_{VP} to Ω_{AP}. The difference is

$$\begin{aligned}\Delta &\equiv \mathbb{E}[WTP|\Omega_{AP}]\mathbb{E}[\mu|\Omega_{AP}] - \mathbb{E}[WTP|\Omega_{VP}]\mathbb{E}[\mu|\Omega_{VP}] \\ &= \mathbb{E}[WTP|\Omega_{VP}]\Delta\mu + \mathbb{E}[\mu|\Omega_{VP}]\Delta WTP + \Delta WTP\Delta\mu\end{aligned}$$

We could consider *first* adjusting the WTP and then changing μ, thereby attributing the second-order term to the selection on μ, in which case we would decompose the difference as

$$\Delta = \mathbb{E}[\mu|\Omega_{VP}]\Delta WTP + \mathbb{E}[WTP|\Omega_{AP}]\Delta\mu$$

or we could consider adjusting μ first and then changing WTP, attributing the second-order term to the selection on WTP, in which case we would decompose the difference as

$$\Delta = \mathbb{E}[WTP|\Omega_{VP}]\Delta\mu + \mathbb{E}[\mu|\Omega_{AP}]\Delta WTP$$

In general, we can expand around an intermediate point, θ fraction of the way from $\mathbb{E}[WTP|\Omega_{VP}]$ to $\mathbb{E}[WTP|\Omega_{AP}]$. This will ascribe θ fraction of the second-order term to selection on μ and $1-\theta$ fraction to selection on WTP. Let $\theta \in [0,1]$ and define

$$\begin{aligned}wtp_\theta &\equiv \mathbb{E}[WTP|\Omega_{VP}] + \theta\Delta WTP \\ \mu_\theta &\equiv \mathbb{E}[\mu|\Omega_{VP}] + (1-\theta)\Delta\mu\end{aligned}$$

Then the difference can be decomposed as

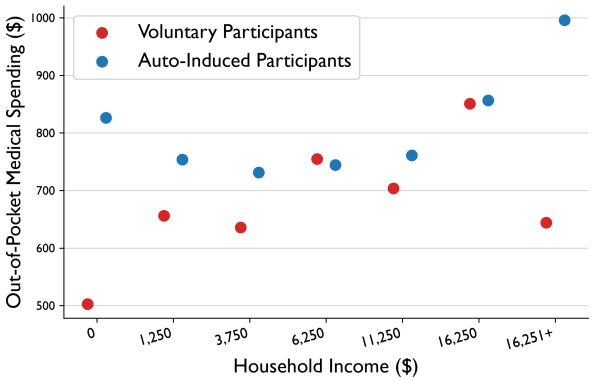
$$\Delta = WTP_\theta\Delta\mu + \mu_\theta\Delta WTP$$

In the main analysis we use $\theta = 0.5$, which is the decomposition resulting from smoothly adjusting μ and WTP simultaneously from $\mathbb{E}[\mu|\Omega_{VP}]$ and $\mathbb{E}[WTP|\Omega_{VP}]$ to $\mathbb{E}[\mu|\Omega_{AP}]$ and $\mathbb{E}[WTP|\Omega_{AP}]$, respectively, at a constant rate. This expansion around the midpoint of the voluntary participant and auto-induced participant values allocates the second-order term equally between the two selection effects. Regardless of the choice of θ, the decomposition will show advantageous selection on μ and disadvantageous selection on WTP, with the advantageous selection on marginal utility outweighing the disadvantageous selection on willingness-to-pay so that the overall selection on value is advantageous, indicating that

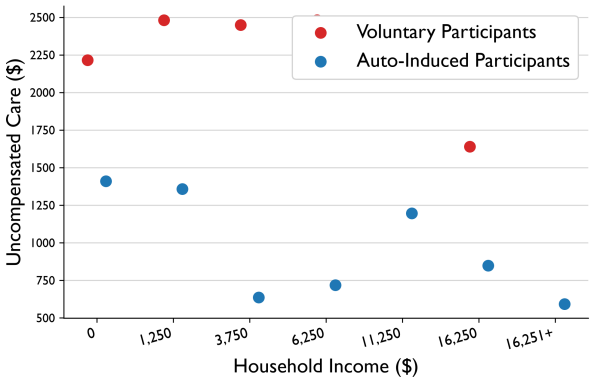
per-participant value is higher for voluntary participants than auto-induced participants.

C Additional Descriptive Figures & Tables

Figure C.1: **Finding 1: By Participant Group**

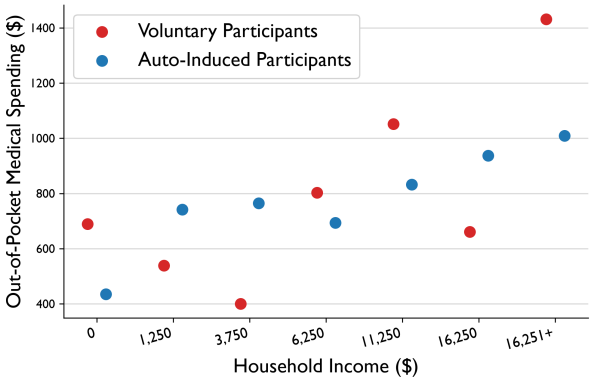


(a) Out-of-Pocket Medical Spending by Household Income

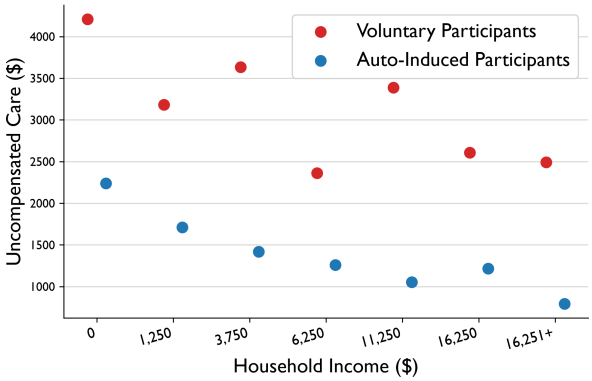


(b) Uncompensated Care by Household Income

Baseline grouping scheme. Binned scatter plots of mean out-of-pocket medical spending by household income bin and mean uncompensated care, the difference between total health spending and out-of-pocket medical spending, by household income bin for Voluntary Participants ($D = 1, Z = 1$) and Auto-Induced Participants ($D = 0, Z = 1$), restricted to individuals with household income below 150% of the Federal Poverty Line. Both total health spending and out-of-pocket medical spending are measured at the 0-month survey.



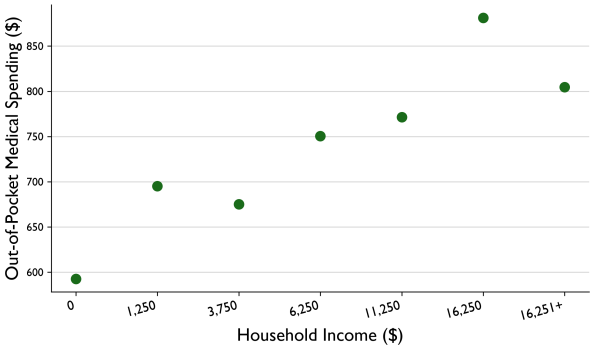
(c) Out-of-Pocket Medical Spending by Household Income



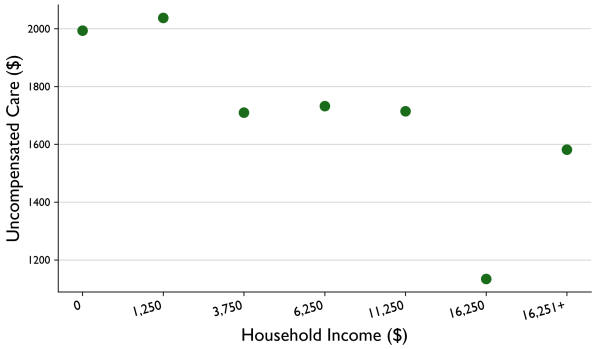
(d) Implicit Insurance by Household Income

Alternative grouping scheme. Binned scatter plots of mean out-of-pocket medical spending by household income bin and mean uncompensated care, the difference between total health spending and out-of-pocket medical spending, by household income bin for Voluntary Participants ($D = 1, Z = 0$) and Auto-Induced Participants ($D = 0, Z = 0$), restricted to individuals with household income below 150% of the Federal Poverty Line. Both total health spending and out-of-pocket medical spending are measured at the 0-month survey.

Figure C.2: **Descriptive Facts: 100% Federal Poverty Line**

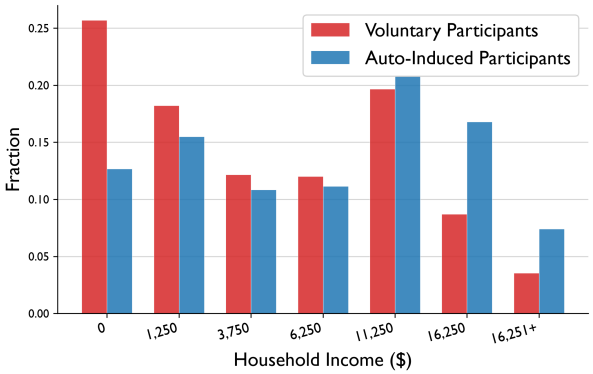


(a) Out-of-Pocket Medical Spending by Household Income

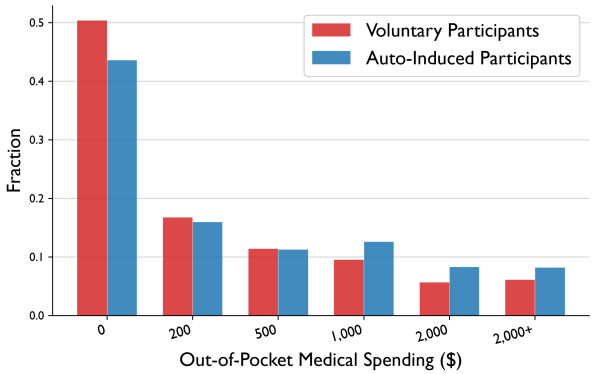


(b) Uncompensated Care by Household Income

Finding 1. — Binned scatter plots of mean out-of-pocket medical spending by household income bin and mean uncompensated care, the difference between total health spending and out-of-pocket medical spending, by household income, restricted to individuals with household income below 100% of the Federal Poverty Line. Both total and out-of-pocket health spending are measured at the 0-month survey.



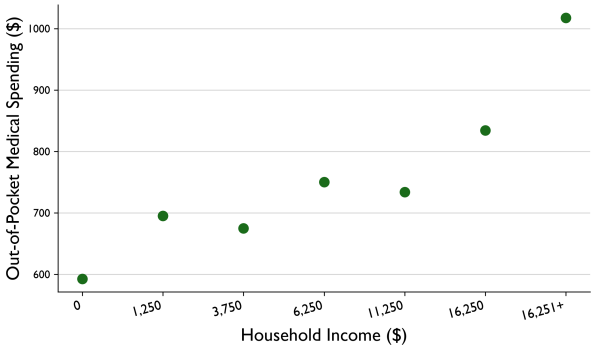
(c) Household Income (by Take-Up)



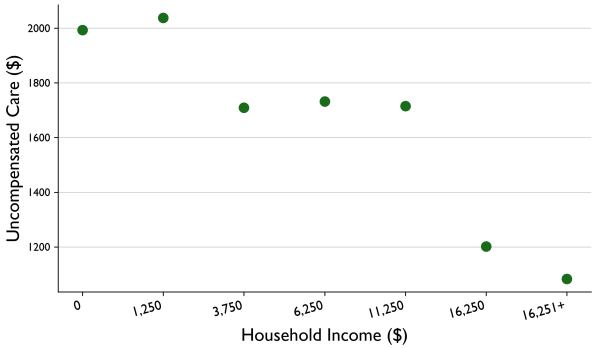
(d) Out-of-Pocket Medical Spending (by Take-Up)

Finding 2. — Histogram of household income and out-of-pocket medical spending, separately for voluntary participants ($Z = 1, D = 1$) and auto-induced participants ($Z = 1, D = 0$), restricted to individuals with household income below 100% of the Federal Poverty Line. Both household income and out-of-pocket medical spending are measured at the 0-month survey.

Figure C.3: **Descriptive Facts: 200% Federal Poverty Line**

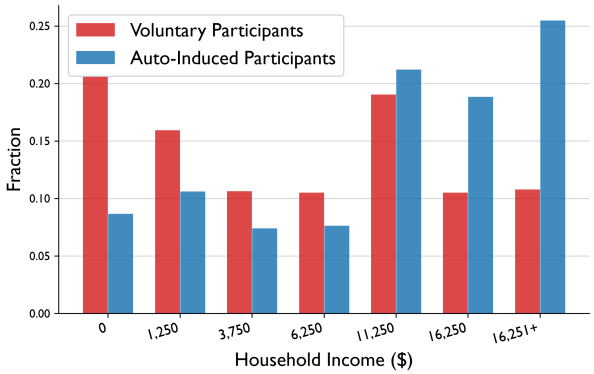


(a) Out-of-Pocket Medical Spending by Household Income

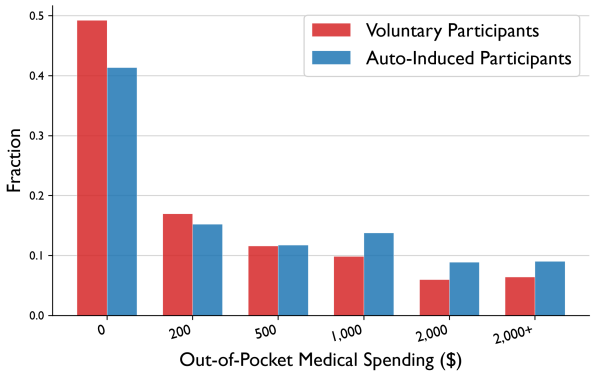


(b) Uncompensated Care by Household Income

Finding 1. — Binned scatter plots of mean out-of-pocket medical spending by household income bin and mean uncompensated care, the difference between total health spending and out-of-pocket medical spending, by household income, restricted to individuals with household income below 200% of the Federal Poverty Line. Both total and out-of-pocket health spending are measured at the 0-month survey.



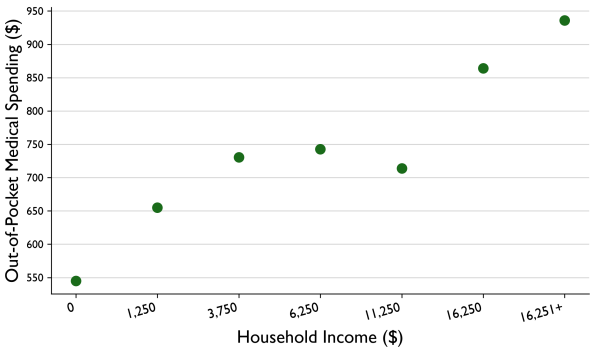
(c) Household Income (by Take-Up)



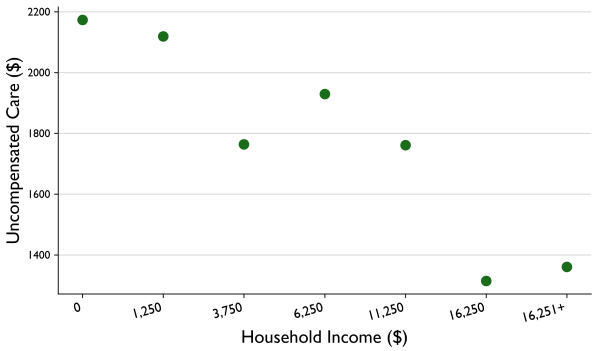
(d) Out-of-Pocket Medical Spending (by Take-Up)

Finding 2. — Histogram of household income and out-of-pocket medical spending, separately for voluntary participants ($Z = 1, D = 1$) and auto-induced participants ($Z = 1, D = 0$), restricted to individuals with household income below 200% of the Federal Poverty Line. Both household income and out-of-pocket medical spending are measured at the 0-month survey.

Figure C.4: **Descriptive Facts: Inclusive**

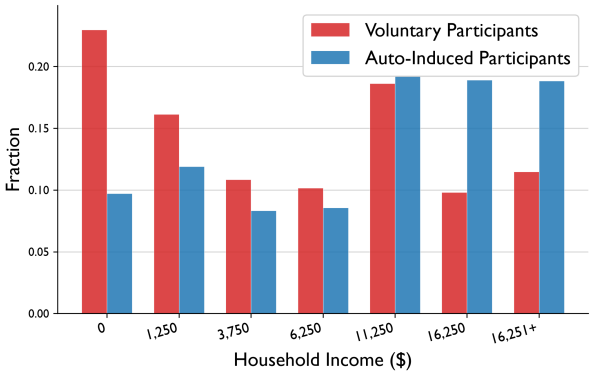


(a) Out-of-Pocket Medical Spending by Household Income

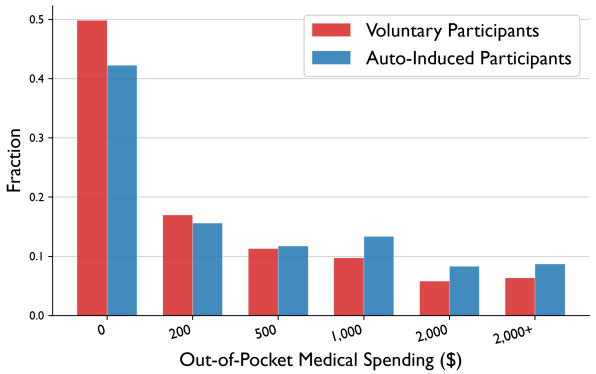


(b) Uncompensated Care by Household Income

Finding 1. — Binned scatter plots of mean out-of-pocket medical spending by household income bin and mean uncompensated care, the difference between total health spending and out-of-pocket medical spending, by household income, restricted to individuals with household income below 150% of the Federal Poverty Line or report Medicaid participation at the time of the 0-month survey. Both total health spending and out-of-pocket medical spending are measured at the 0-month survey.



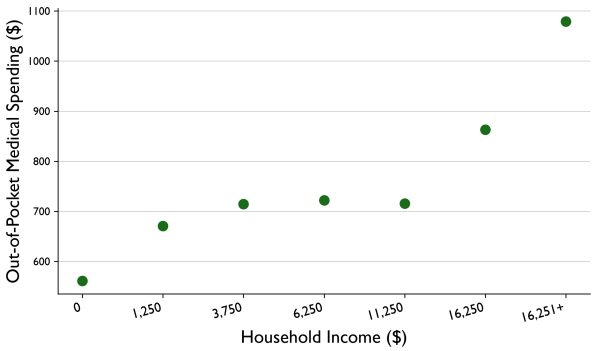
(c) Household Income (by Take-Up)



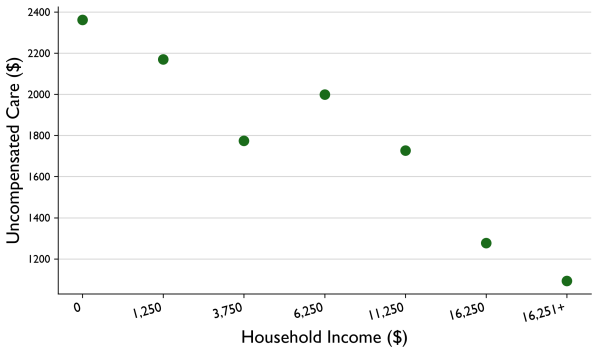
(d) Out-of-Pocket Medical Spending (by Take-Up)

Finding 2. — Histogram of household income and out-of-pocket medical spending, separately for voluntary participants ($Z = 1$, $D = 1$) and auto-induced participants ($Z = 1$, $D = 0$), restricted to individuals who either have household income below 150% of the Federal Poverty Line or report Medicaid participation at the time of the 0-month survey. Both household income and out-of-pocket medical spending are measured at the 0-month survey

Figure C.5: **Descriptive Facts: No Eligibility Restrictions**

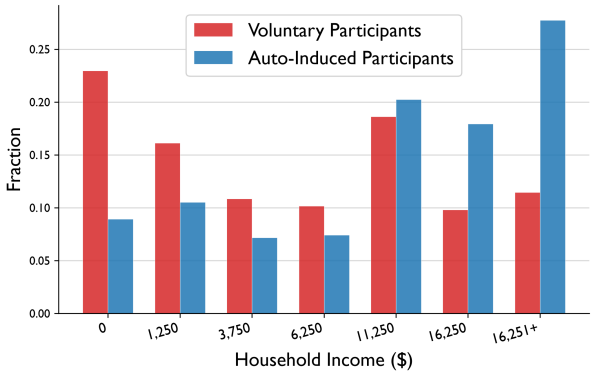


(a) Out-of-Pocket Medical Spending by Household Income

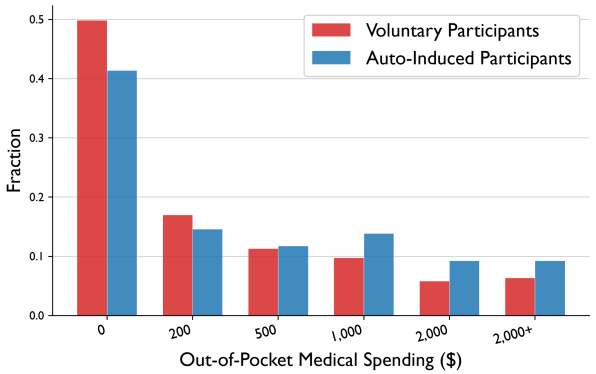


(b) Uncompensated Care by Household Income

Finding 1. — Binned scatter plots of mean out-of-pocket medical spending by household income bin and mean uncompensated care, the difference between total health spending and out-of-pocket medical spending, by household income. No eligibility restrictions imposed. Both total health spending and out-of-pocket medical spending are measured at the 0-month survey.



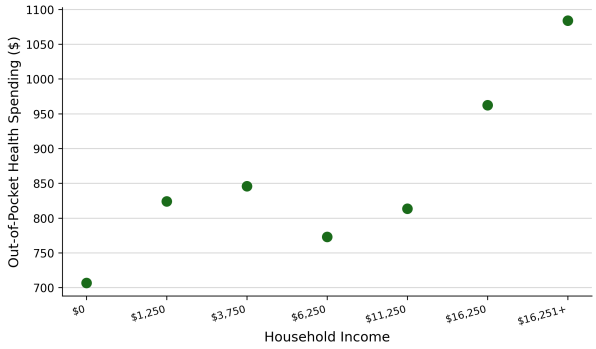
(c) Household Income (by Take-Up)



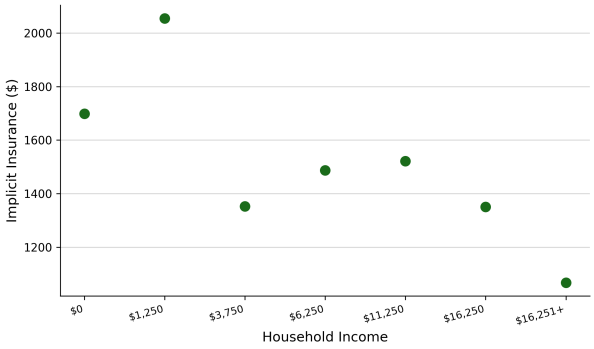
(d) Out-of-Pocket Medical Spending (by Take-Up)

Finding 2. — Histogram of household income and out-of-pocket medical spending, separately for voluntary participants ($Z = 1, D = 1$) and auto-induced participants ($Z = 1, D = 0$). No eligibility restrictions imposed. Both household income and out-of-pocket medical spending are measured at the 0-month survey.

Figure C.6: **Descriptive Facts: No Insurance at 0-Month Survey**



(a) Out-of-Pocket Medical Spending by Household Income

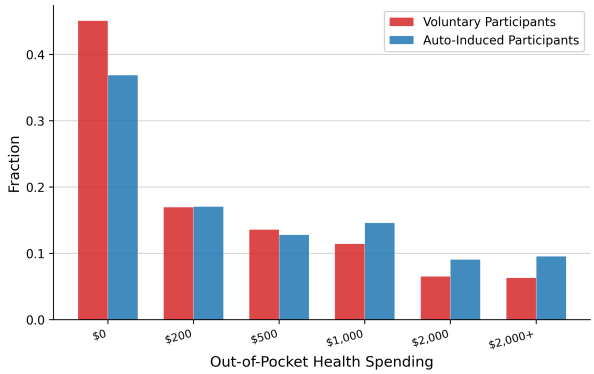


(b) Uncompensated Care by Household Income

Finding 1. — Binned scatter plots of mean out-of-pocket medical spending by household income bin and mean uncompensated care, the difference between total health spending and out-of-pocket medical spending, by household income, restricted to individuals with household income below 150% of the Federal Poverty Line who report no insurance coverage at the time of the 0-month survey. Both total health spending and out-of-pocket medical spending are measured at the 0-month survey.



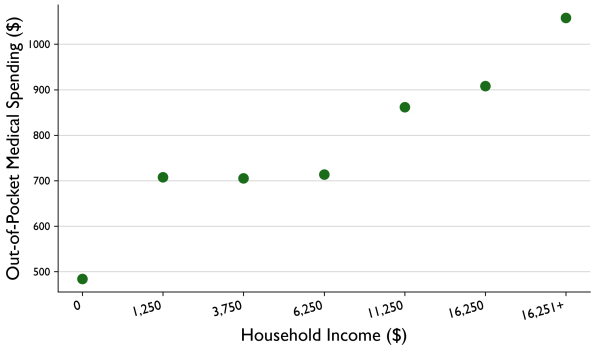
(c) Household Income (by Take-Up)



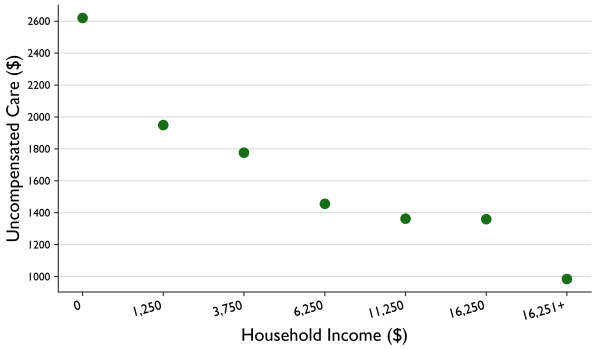
(d) Out-of-Pocket Medical Spending (by Take-Up)

Finding 2. — Histogram of household income and out-of-pocket medical spending, separately for voluntary participants ($Z = 1, D = 1$) and auto-induced participants ($Z = 1, D = 0$), restricted to individuals with household income below 150% of the Federal Poverty Line who report no insurance coverage at the time of the 0-month survey. Both household income and out-of-pocket medical spending are measured at the 0-month survey.

Figure C.7: **Descriptive Facts: Alternative Grouping Scheme**

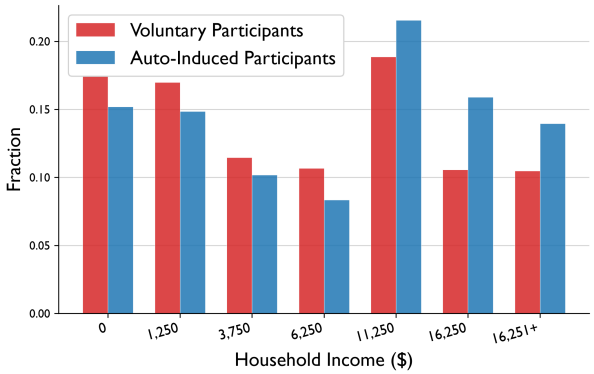


(a) Out-of-Pocket Medical Spending by Household Income

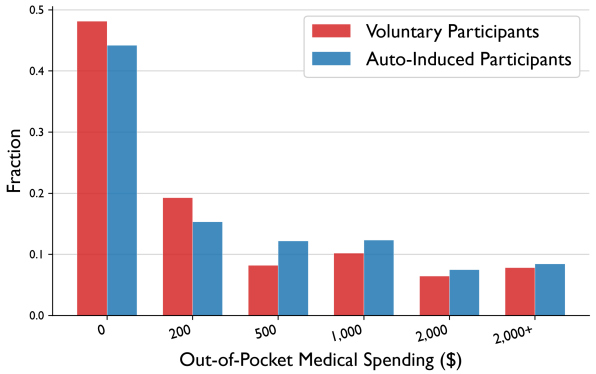


(b) Uncompensated Care by Household Income

Finding 1. — Alternative grouping scheme. Binned scatter plots of mean out-of-pocket health spending by household income bin and mean uncompensated care by household income among lottery losers ($Z = 0$), restricted to individuals with household income below 150% of the Federal Poverty Line. Out-of-pocket medical spending is measured at the 0-month survey. Uncompensated care is the difference between total health spending and out-of-pocket health spending, both measured at the 0-month survey.



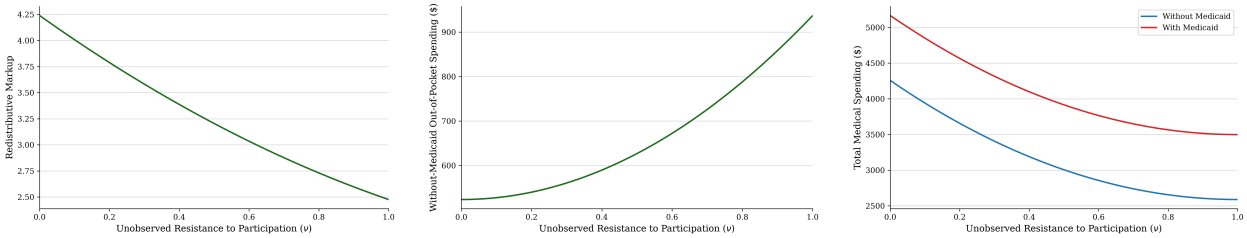
(c) Household Income (by Participant Group)



(d) Out-of-Pocket Medical Spending (by Participant Group)

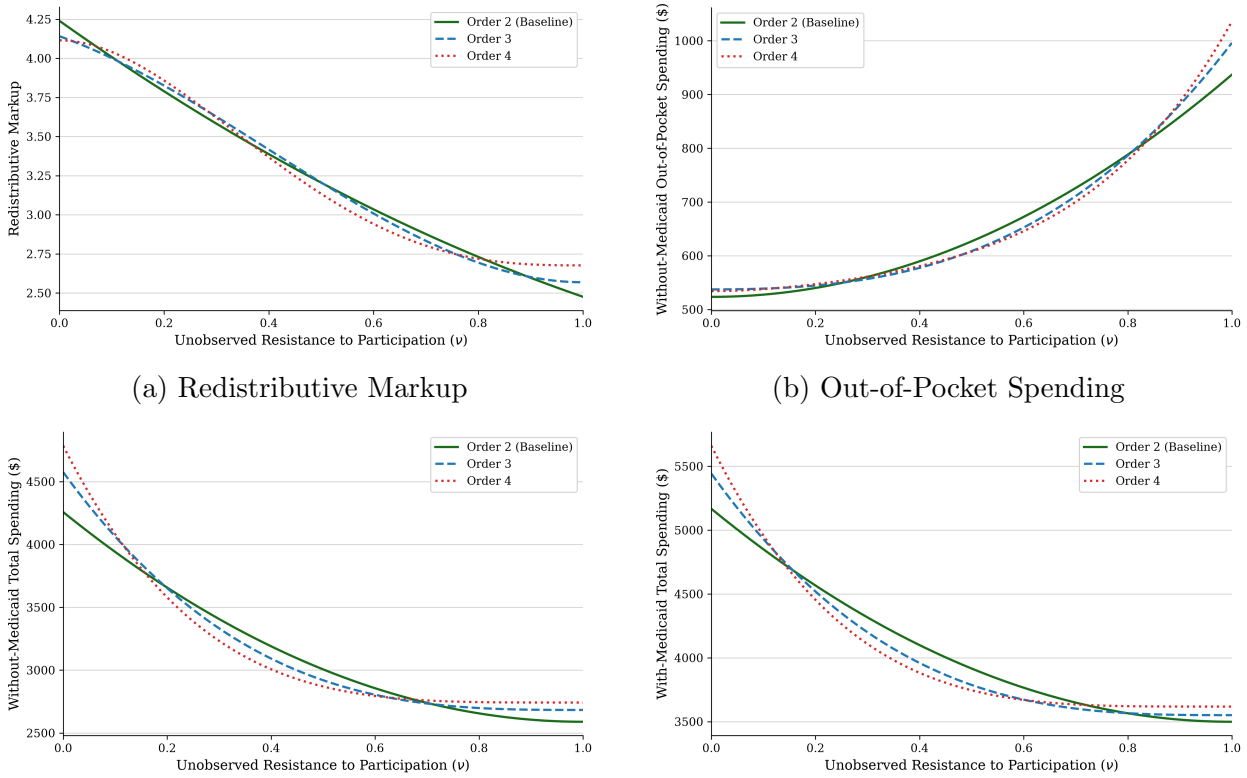
Finding 2. — Alternative grouping scheme. Histogram of household income and out-of-pocket medical spending, separately for voluntary participants ($Z = 0, D = 1$) and auto-induced participants ($Z = 0, D = 0$), restricted to individuals with household income below 150% of the Federal Poverty Line. Both household income and out-of-pocket medical spending are measured at the 0-month survey.

D Additional Welfare Figures & Tables



(a) Redistributive Markup (b) Out-of-Pocket Spending (c) Total Medical Spending

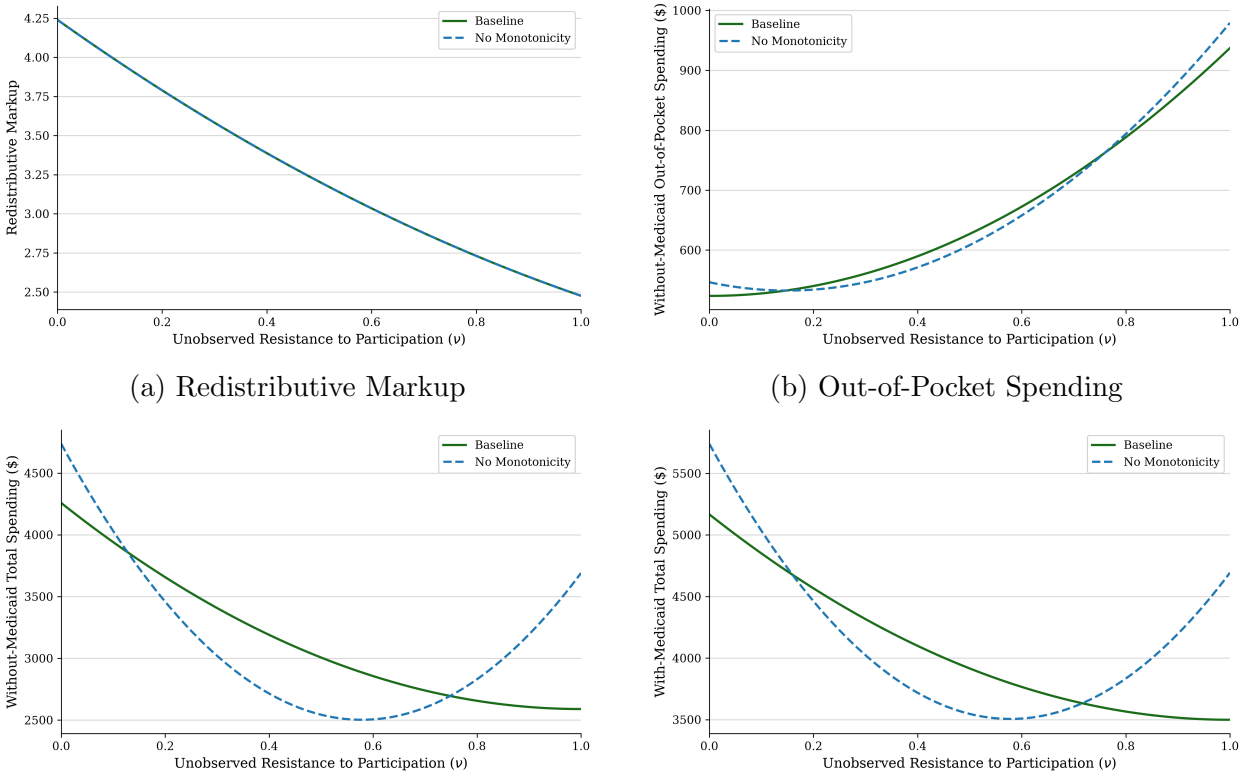
Figure D.1 – **Baseline Marginal Treatment Response Functions.** — Each panel plots an estimated MTR function evaluated at sample-mean covariates ($\bar{X}$) against unobserved resistance to participation (ν), restricted to individuals with household income below 150% of the Federal Poverty Line. Panel (a) plots the redistributive markup $\mu(\bar{X}, \nu)$. Panel (b) plots without-Medicaid out-of-pocket spending $\text{oop}_0(\bar{X}, \nu)$. Panel (c) plots without-Medicaid (blue) and with-Medicaid (red) total medical spending, $\text{care}_0(\bar{X}, \nu)$ and $\text{care}_1(\bar{X}, \nu)$. MTR functions are additively separable in X and ν, linear in X, and specified with second-order Bernstein polynomial basis functions in a normalization of ν. Outcomes are measured at the one-year follow-up survey.



(a) Redistributive Markup (b) Out-of-Pocket Spending

(c) Without-Medicaid Total Spending (d) With-Medicaid Total Spending

Figure D.2 – **Marginal Treatment Response Functions by Bernstein Order.** Each panel plots an estimated MTR function evaluated at sample-mean covariates ($\bar{X}$) against unobserved resistance to participation (ν), restricted to individuals with household income below 150% of the Federal Poverty Line, for second- (baseline), third-, and fourth-order Bernstein polynomial approximations to the MTR functions. Panel (a) plots the redistributive markup $\mu(\bar{X}, \nu)$, panel (b) without-Medicaid out-of-pocket spending $\text{oop}_0(\bar{X}, \nu)$, panel (c) without-Medicaid total spending $\text{care}_0(\bar{X}, \nu)$, and panel (d) with-Medicaid total spending $\text{care}_1(\bar{X}, \nu)$. MTR functions are additively separable in X and ν and linear in X. Outcomes are measured at the one-year follow-up survey.



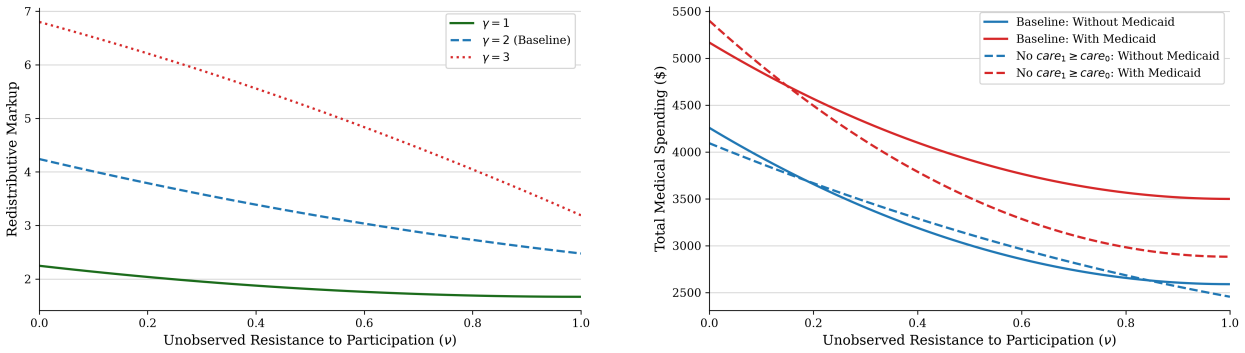
(a) Redistributive Markup

(b) Out-of-Pocket Spending

(c) Without-Medicaid Total Spending

(d) With-Medicaid Total Spending

Figure D.3 – **Marginal Treatment Response Functions without Monotonicity in ν.** Each panel plots an estimated MTR function evaluated at sample-mean covariates ($\bar{X}$) against unobserved resistance to participation (ν), restricted to individuals with household income below 150% of the Federal Poverty Line, under the baseline specification and a specification that drops the constraint that the MTR functions be monotonic in ν. Panel (a) plots the redistributive markup $\mu(\bar{X}, \nu)$, panel (b) without-Medicaid out-of-pocket spending $\text{oop}_0(\bar{X}, \nu)$, panel (c) without-Medicaid total spending $\text{care}_0(\bar{X}, \nu)$, and panel (d) with-Medicaid total spending $\text{care}_1(\bar{X}, \nu)$. MTR functions are specified with second-order Bernstein polynomial basis functions in a normalization of ν. Outcomes are measured at the one-year follow-up survey.



(a) Redistributive Markup, by γ

(b) Total Medical Spending

Figure D.4 – **Sensitivity to Risk Aversion and the Cost Monotonicity Constraint.** Panel (a) plots the redistributive markup $\mu(\bar{X}, \nu)$ against unobserved resistance to participation (ν) for coefficients of relative risk aversion $\gamma \in \{2, 3, 4\}$; only the markup varies with γ. Panel (b) plots without-Medicaid (blue) and with-Medicaid (red) total medical spending under the baseline (solid) and under a specification that drops the constraint that with-Medicaid spending weakly exceed without-Medicaid spending (dashed). Both panels evaluate MTR functions at sample-mean covariates ($\bar{X}$) and restrict to individuals with household income below 150% of the Federal Poverty Line. Outcomes are measured at the one-year follow-up survey.

Table D.1: Robustness to Eligibility Threshold

Panel I: Per-Participant

	100% FPL		150% FPL (Baseline)		200% FPL	
	Voluntary Participants	Auto-Induced Participants	Voluntary Participants	Auto-Induced Participants	Voluntary Participants	Auto-Induced Participants
Panel A: Parameter Estimates						
Redistributive Markup	4.05	2.80	3.85	2.66	3.64	2.52
Without-Medicaid Out-of-Pocket Spending	503	763	557	766	596	768
Without-Medicaid Total Spending	3,574	2,637	3,683	2,606	3,686	2,628
With-Medicaid Total Spending	4,696	3,734	4,612	3,497	4,590	3,490
Panel B: Welfare Estimates						
Ex-Ante Value	1,976	2,080	2,113	2,002	2,147	1,895
Redistributive Markup	4.05	2.80	3.85	2.66	3.64	2.52
Willingness to Pay	503	763	557	766	596	768
Cost-Equivalent Value	1,727	1,977	1,578	1,761	1,594	1,732
Per-Participant Surplus	249	103	534	241	553	163

Panel II: Per-Eligible

	100% FPL		150% FPL (Baseline)		200% FPL	
	Voluntary Enrollment	Automatic Enrollment	Voluntary Enrollment	Automatic Enrollment	Voluntary Enrollment	Automatic Enrollment
Panel A: Parameter Estimates						
Redistributive Markup	4.05	3.50	3.85	3.26	3.64	3.05
Without-Medicaid Out-of-Pocket Spending	503	617	557	661	596	686
Without-Medicaid Total Spending	3,574	3,161	3,683	3,145	3,686	3,131
With-Medicaid Total Spending	4,696	4,272	4,612	4,055	4,590	4,013
Panel B: Welfare Estimates						
Ex-Ante Value	1,105	2,022	1,058	2,057	1,022	2,015
Willingness to Pay	281	617	279	661	284	686
Cost-Equivalent Value	965	1,837	790	1,670	759	1,667
Per-Eligible Surplus	139	185	267	388	263	349
Participation Share	0.56	1.00	0.50	1.00	0.48	1.00

Notes: Parameter estimates and welfare estimates across eligibility thresholds of 100%, 150%, and 200% of the Federal Poverty Line. Panel I reports per-participant estimates for voluntary (always-takers and compliers) and auto-induced (never-takers) participants. Panel II reports per-eligible estimates under voluntary and automatic enrollment, where each object is scaled by the participation share.

Table D.2: Robustness to Consumption Floor

Panel I: Per-Participant

	1st Percentile		5th Percentile (Baseline)		10th Percentile	
	Voluntary Participants	Auto-Induced Participants	Voluntary Participants	Auto-Induced Participants	Voluntary Participants	Auto-Induced Participants
Panel A: Parameter Estimates						
Redistributive Markup	6.91	4.22	3.85	2.66	2.95	2.22
Without-Medicaid Out-of-Pocket Spending	557	766	557	766	557	766
Without-Medicaid Total Spending	3,683	2,606	3,683	2,606	3,683	2,606
With-Medicaid Total Spending	4,612	3,497	4,612	3,497	4,612	3,497
Panel B: Welfare Estimates						
Ex-Ante Value	3,768	3,145	2,113	2,002	1,622	1,677
Redistributive Markup	6.91	4.22	3.85	2.66	2.95	2.22
Willingness to Pay	557	766	557	766	557	766
Cost-Equivalent Value	1,578	1,761	1,578	1,761	1,578	1,761
Per-Participant Surplus	2,190	1,384	534	241	44	−84

Panel II: Per-Eligible

	1st Percentile		5th Percentile (Baseline)		10th Percentile	
	Voluntary Enrollment	Automatic Enrollment	Voluntary Enrollment	Automatic Enrollment	Voluntary Enrollment	Automatic Enrollment
Panel A: Parameter Estimates						
Redistributive Markup	6.91	5.56	3.85	3.26	2.95	2.58
Without-Medicaid Out-of-Pocket Spending	557	661	557	661	557	661
Without-Medicaid Total Spending	3,683	3,145	3,683	3,145	3,683	3,145
With-Medicaid Total Spending	4,612	4,055	4,612	4,055	4,612	4,055
Panel B: Welfare Estimates						
Ex-Ante Value	1,886	3,457	1,058	2,057	812	1,650
Willingness to Pay	279	661	279	661	279	661
Cost-Equivalent Value	790	1,670	790	1,670	790	1,670
Per-Eligible Surplus	1,096	1,787	267	388	22	−20
Participation Share	0.50	1.00	0.50	1.00	0.50	1.00

Notes: Parameter estimates and welfare estimates across consumption floors at the 1st, 5th, and 10th percentiles of the equivalized consumption distribution. Panel I reports per-participant estimates for voluntary (always-takers and compliers) and auto-induced (never-takers) participants. Panel II reports per-eligible estimates under voluntary and automatic enrollment, where each object is scaled by the participation share.

Table D.3: Robustness to Coefficient of Relative Risk Aversion

Panel I: Per-Participant

	$\gamma = 1$		$\gamma = 2$ (Baseline)		$\gamma = 3$	
	Voluntary Participants	Auto-Induced Participants	Voluntary Participants	Auto-Induced Participants	Voluntary Participants	Auto-Induced Participants
Panel A: Parameter Estimates						
Redistributive Markup	2.06	1.66	3.85	2.66	6.34	3.93
Without-Medicaid Out-of-Pocket Spending	557	766	557	766	557	766
Without-Medicaid Total Spending	3,683	2,606	3,683	2,606	3,683	2,606
With-Medicaid Total Spending	4,612	3,497	4,612	3,497	4,612	3,497
Panel B: Welfare Estimates						
Ex-Ante Value	1,135	1,263	2,113	2,002	3,471	2,925
Redistributive Markup	2.06	1.66	3.85	2.66	6.34	3.93
Willingness to Pay	557	766	557	766	557	766
Cost-Equivalent Value	1,578	1,761	1,578	1,761	1,578	1,761
Per-Participant Surplus	−443	−499	534	241	1,892	1,163

Panel II: Per-Eligible

	$\gamma = 1$		$\gamma = 2$ (Baseline)		$\gamma = 3$	
	Voluntary Enrollment	Automatic Enrollment	Voluntary Enrollment	Automatic Enrollment	Voluntary Enrollment	Automatic Enrollment
Panel A: Parameter Estimates						
Redistributive Markup	2.06	1.86	3.85	3.26	6.34	5.13
Without-Medicaid Out-of-Pocket Spending	557	661	557	661	557	661
Without-Medicaid Total Spending	3,683	3,145	3,683	3,145	3,683	3,145
With-Medicaid Total Spending	4,612	4,055	4,612	4,055	4,612	4,055
Panel B: Welfare Estimates						
Ex-Ante Value	568	1,199	1,058	2,057	1,738	3,198
Willingness to Pay	279	661	279	661	279	661
Cost-Equivalent Value	790	1,670	790	1,670	790	1,670
Per-Eligible Surplus	−222	−471	267	388	947	1,528
Participation Share	0.50	1.00	0.50	1.00	0.50	1.00

Notes: Parameter estimates and welfare estimates across coefficients of relative risk aversion $\gamma \in \{1, 2, 3\}$ under CRRA utility. Panel I reports per-participant estimates for voluntary (always-takers and compliers) and auto-induced (never-takers) participants. Panel II reports per-eligible estimates under voluntary and automatic enrollment, where each object is scaled by the participation share.

Table D.4: Robustness to Moral Hazard Assumption

Panel I: Per-Participant

	$\alpha = 0$ (Baseline)		$\alpha = 0.5$		$\alpha = 1.0$	
	Voluntary Participants	Auto-Induced Participants	Voluntary Participants	Auto-Induced Participants	Voluntary Participants	Auto-Induced Participants
Panel A: Parameter Estimates						
Redistributive Markup	3.85	2.66	3.85	2.66	3.85	2.66
Without-Medicaid Out-of-Pocket Spending	557	766	557	766	557	766
Without-Medicaid Total Spending	3,683	2,606	3,683	2,606	3,683	2,606
With-Medicaid Total Spending	4,612	3,497	4,612	3,497	4,612	3,497
Panel B: Welfare Estimates						
Ex-Ante Value	2,113	2,002	2,676	2,646	3,239	3,290
Redistributive Markup	3.85	2.66	3.85	2.66	3.85	2.66
Willingness to Pay	557	766	707	1,015	858	1,264
Cost-Equivalent Value	1,578	1,761	1,578	1,761	1,578	1,761
Per-Participant Surplus	534	241	1,097	885	1,660	1,529

Panel II: Per-Eligible

	$\alpha = 0$ (Baseline)		$\alpha = 0.5$		$\alpha = 1.0$	
	Voluntary Enrollment	Automatic Enrollment	Voluntary Enrollment	Automatic Enrollment	Voluntary Enrollment	Automatic Enrollment
Panel A: Parameter Estimates						
Redistributive Markup	3.85	3.26	3.85	3.26	3.85	3.26
Without-Medicaid Out-of-Pocket Spending	557	661	557	661	557	661
Without-Medicaid Total Spending	3,683	3,145	3,683	3,145	3,683	3,145
With-Medicaid Total Spending	4,612	4,055	4,612	4,055	4,612	4,055
Panel B: Welfare Estimates						
Ex-Ante Value	1,058	2,057	1,340	2,661	1,621	3,264
Willingness to Pay	279	661	354	861	430	1,060
Cost-Equivalent Value	790	1,670	790	1,670	790	1,670
Per-Eligible Surplus	267	388	549	991	831	1,595
Participation Share	0.50	1.00	0.50	1.00	0.50	1.00

Notes: Parameter estimates and welfare estimates across alternative assumptions about the share α of Medicaid-induced utilization that is welfare-relevant. Panel I reports per-participant estimates for voluntary (always-takers and compliers) and auto-induced (never-takers) participants. Panel II reports per-eligible estimates under voluntary and automatic enrollment, where each object is scaled by the participation share.

Table D.5: Robustness to Bernstein Polynomial Order

Panel I: Per-Participant

	Order 2 (Baseline)		Order 3		Order 4	
	Voluntary Participants	Auto-Induced Participants	Voluntary Participants	Auto-Induced Participants	Voluntary Participants	Auto-Induced Participants
Panel A: Parameter Estimates						
Redistributive Markup	3.85	2.66	3.86	2.65	3.85	2.66
Without-Medicaid Out-of-Pocket Spending	557	766	555	768	556	768
Without-Medicaid Total Spending	3,683	2,606	3,697	2,614	3,668	2,632
With-Medicaid Total Spending	4,612	3,497	4,583	3,464	4,563	3,488
Panel B: Welfare Estimates						
Ex-Ante Value	2,113	2,002	2,111	2,000	2,109	2,011
Redistributive Markup	3.85	2.66	3.86	2.65	3.85	2.66
Willingness to Pay	557	766	555	768	556	768
Cost-Equivalent Value	1,578	1,761	1,531	1,719	1,542	1,725
Per-Participant Surplus	534	241	580	281	567	285

Panel II: Per-Eligible

	Order 2 (Baseline)		Order 3		Order 4	
	Voluntary Enrollment	Automatic Enrollment	Voluntary Enrollment	Automatic Enrollment	Voluntary Enrollment	Automatic Enrollment
Panel A: Parameter Estimates						
Redistributive Markup	3.85	3.26	3.86	3.26	3.85	3.26
Without-Medicaid Out-of-Pocket Spending	557	661	555	661	556	662
Without-Medicaid Total Spending	3,683	3,145	3,697	3,156	3,668	3,151
With-Medicaid Total Spending	4,612	4,055	4,583	4,024	4,563	4,026
Panel B: Welfare Estimates						
Ex-Ante Value	1,058	2,057	1,057	2,056	1,056	2,060
Willingness to Pay	279	661	278	661	278	662
Cost-Equivalent Value	790	1,670	766	1,625	772	1,633
Per-Eligible Surplus	267	388	291	431	284	427
Participation Share	0.50	1.00	0.50	1.00	0.50	1.00

Notes: Parameter estimates and welfare estimates across second-, third-, and fourth-order Bernstein polynomial approximations to the MTR functions. Panel I reports per-participant estimates for voluntary (always-takers and compliers) and auto-induced (never-takers) participants. Panel II reports per-eligible estimates under voluntary and automatic enrollment, where each object is scaled by the participation share.

Table D.6: Robustness to No Monotonicity in ν

Panel I: Per-Participant

	Baseline		No Monotonicity	
	Voluntary Participants	Auto-Induced Participants	Voluntary Participants	Auto-Induced Participants
Panel A: Parameter Estimates				
Redistributive Markup	3.85	2.66	3.85	2.66
Without-Medicaid Out-of-Pocket Spending	557	766	550	770
Without-Medicaid Total Spending	3,683	2,606	3,485	2,714
With-Medicaid Total Spending	4,612	3,497	4,530	3,676
Panel B: Welfare Estimates				
Ex-Ante Value	2,113	2,002	2,087	2,009
Redistributive Markup	3.85	2.66	3.85	2.66
Willingness to Pay	557	766	550	770
Cost-Equivalent Value	1,578	1,761	1,695	1,840
Per-Participant Surplus	534	241	392	169

Panel II: Per-Eligible

	Baseline		No Monotonicity	
	Voluntary Enrollment	Automatic Enrollment	Voluntary Enrollment	Automatic Enrollment
Panel A: Parameter Estimates				
Redistributive Markup	3.85	3.26	3.85	3.26
Without-Medicaid Out-of-Pocket Spending	557	661	550	660
Without-Medicaid Total Spending	3,683	3,145	3,485	3,100
With-Medicaid Total Spending	4,612	4,055	4,530	4,104
Panel B: Welfare Estimates				
Ex-Ante Value	1,058	2,057	1,045	2,048
Willingness to Pay	279	661	275	660
Cost-Equivalent Value	790	1,670	849	1,768
Per-Eligible Surplus	267	388	196	280
Participation Share	0.50	1.00	0.50	1.00

Notes: Parameter estimates and welfare estimates across the baseline specification and a specification that drops the constraint that the MTR functions be monotonic in ν. Panel I reports per-participant estimates for voluntary (always-takers and compliers) and auto-induced (never-takers) participants. Panel II reports per-eligible estimates under voluntary and automatic enrollment, where each object is scaled by the participation share.

Table D.7: Robustness to Dropping $care_1 \geq care_0$

Panel I: Per-Participant

	Baseline		No $\text{care}_1 \geq \text{care}_0$	
	Voluntary Participants	Auto-Induced Participants	Voluntary Participants	Auto-Induced Participants
Panel A: Parameter Estimates				
Redistributive Markup	3.85	2.66	3.85	2.66
Without-Medicaid Out-of-Pocket Spending	557	766	557	766
Without-Medicaid Total Spending	3,683	2,606	3,697	2,644
With-Medicaid Total Spending	4,612	3,497	4,508	2,932
Panel B: Welfare Estimates				
Ex-Ante Value	2,113	2,002	2,113	2,002
Redistributive Markup	3.85	2.66	3.85	2.66
Willingness to Pay	557	766	557	766
Cost-Equivalent Value	1,578	1,761	1,454	1,120
Per-Participant Surplus	534	241	658	882

Panel II: Per-Eligible

	Baseline		No $\text{care}_1 \geq \text{care}_0$	
	Voluntary Enrollment	Automatic Enrollment	Voluntary Enrollment	Automatic Enrollment
Panel A: Parameter Estimates				
Redistributive Markup	3.85	3.26	3.85	3.26
Without-Medicaid Out-of-Pocket Spending	557	661	557	661
Without-Medicaid Total Spending	3,683	3,145	3,697	3,171
With-Medicaid Total Spending	4,612	4,055	4,508	3,721
Panel B: Welfare Estimates				
Ex-Ante Value	1,058	2,057	1,058	2,057
Willingness to Pay	279	661	279	661
Cost-Equivalent Value	790	1,670	728	1,288
Per-Eligible Surplus	267	388	330	770
Participation Share	0.50	1.00	0.50	1.00

Notes: Parameter estimates and welfare estimates across the baseline specification and a specification that drops the constraint that with-Medicaid total spending weakly exceed without-Medicaid total spending. Panel I reports per-participant estimates for voluntary (always-takers and compliers) and auto-induced (never-takers) participants. Panel II reports per-eligible estimates under voluntary and automatic enrollment, where each object is scaled by the participation share.

Table D.8: Alternative Auto-Enrollment Rules

	Voluntary Enrollment	Non-English	Rural	Public Assistance	Automatic Enrollment
Panel A: Per Marginal Participant					
Marginal Participant Share	0.50 (0.01)	0.03 (0.01)	0.12 (0.01)	0.25 (0.01)	0.50 (0.01)
Ex-Ante Value	2,113 (238)	1,383 (788)	2,646 (218)	2,459 (160)	2,002 (99)
Redistributive Markup	3.85 (0.02)	2.57 (0.67)	3.25 (0.03)	3.29 (0.03)	2.66 (0.02)
Willingness to Pay	557 (60)	556 (189)	830 (67)	751 (49)	766 (37)
Cost-Equivalent Value	1,578 (322)	1,529 (656)	1,862 (397)	1,802 (360)	1,761 (304)
Per-Participant Surplus	534 (385)	−146 (724)	784 (450)	656 (387)	241 (312)
MVPF	1.14 (0.10)	0.92 (1.73)	1.25 (0.14)	1.19 (0.11)	1.08 (0.10)
Panel B: Per Eligible					
Participation Share	0.50 (0.01)	0.53 (0.01)	0.62 (0.01)	0.76 (0.01)	1.00 (0.00)
Ex-Ante Value	1,058 (120)	1,098 (117)	1,379 (126)	1,684 (116)	2,057 (120)
Willingness to Pay	279 (30)	295 (29)	380 (32)	470 (29)	661 (31)
Cost-Equivalent Value	790 (163)	835 (166)	1,016 (197)	1,249 (247)	1,670 (309)
Per-Eligible Surplus	267 (194)	263 (199)	363 (234)	435 (278)	388 (334)

Notes: Welfare estimates across alternative enrollment rules. The first column is voluntary enrollment (the status quo) and the last is blanket automatic enrollment. The middle columns auto-enroll only the named subgroup of eligible non-participants – individuals whose preferred language is not English, individuals living outside the Portland metropolitan area, and individuals receiving SNAP or TANF at baseline – and leave enrollment voluntary for everyone else. Panel A reports estimates per marginal participant: for voluntary enrollment these are voluntary participants; for each other rule they are the eligible non-participants the rule newly enrolls. Marginal participant share is the share of eligible individuals who are marginal participants. The MVPF numerator is ex-ante value plus the provider share of displaced uncompensated care and the denominator is government spending net of the government share of displaced uncompensated care, both scaled by $1/g$. Panel B reports per-eligible estimates for each regime as a whole, each scaled by the regime's participation share.

References for Appendices

Brinch, Christian N., Magne Mogstad, and Matthew Wiswall, "Beyond LATE with a Discrete Instrument," *Journal of Political Economy*, 2017, *125* (4), 985–1039.

Citro, Constance F. and Robert T. Michael, *Measuring Poverty: A New Approach*, Washington, DC: National Academy Press, 1995.

Finkelstein, Amy, Nathaniel Hendren, and Erzo F. P. Luttmer, "The Value of Medicaid: Interpreting Results from the Oregon Health Insurance Experiment," *Journal of Political Economy*, 2019, *127* (6), 2836–2874.

_ , Sarah Taubman, Bill Wright, Mira Bernstein, Jonathan Gruber, Joseph P. Newhouse, Heidi Allen, and Katherine Baicker, "The Oregon Health Insurance Experiment: Evidence from the First Year," *Quarterly Journal of Economics*, 2012, *127* (3), 1057–1106.

Hendren, Nathaniel, "Measuring Economic Efficiency Using Inverse-Optimum Weights," *Journal of Public Economics*, 2020, *187*, 104198.

Kleven, Henrik Jacobsen, "Sufficient Statistics and the Welfare Effects of Tax Reforms," *Annual Review of Economics*, 2021, *13*, 27–50.

Mogstad, Magne, Andres Santos, and Alexander Torgovitsky, "Using Instrumental Variables for Inference about Policy Relevant Treatment Parameters," *Econometrica*, 2018, *86* (5), 1589–1619.

Rose, Evan K. and Yotam Shem-Tov, "On Recoding Ordered Treatments as Binary Indicators," *Review of Economics and Statistics*, forthcoming.