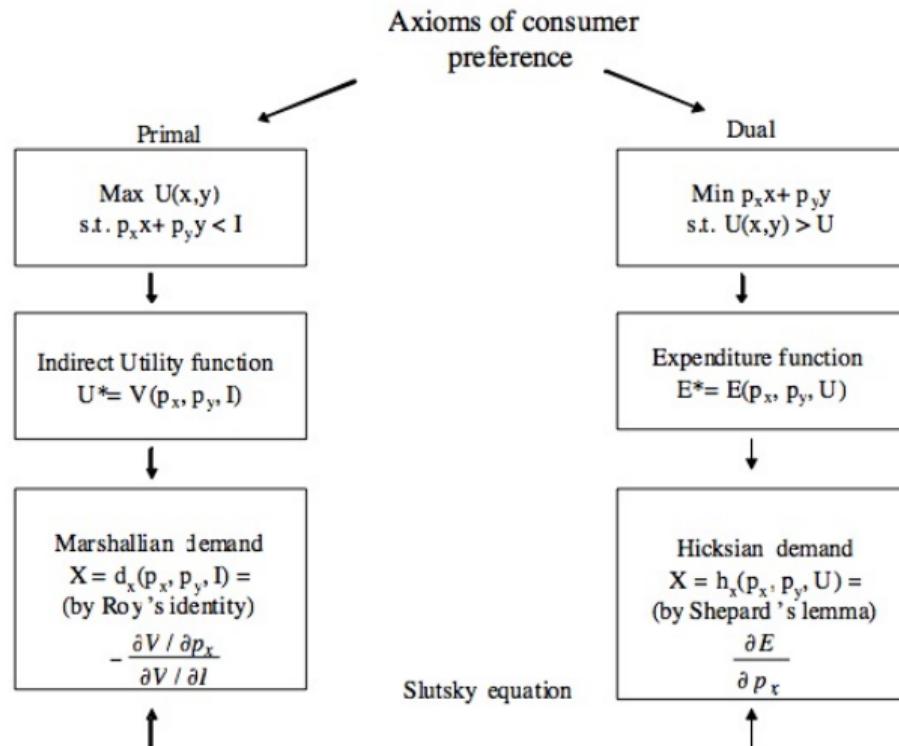


14.03 Microeconomic Theory & Public Policy Fall 2022

Lecture 5. Individual Demand (Part II)

David Autor (prof), MIT Economics and NBER
Jonathan Cohen (TA), MIT Economics

Theory roadmap



The Indirect Utility Function (review)

Indirect Utility Function

- For any
 - Budget constraint
 - Utility function
 - Set of prices

we obtain a set of optimally chosen quantities:

$$x_1^* = x_1(p_1, p_2, \dots, p_n, I)$$

...

$$x_n^* = x_n(p_1, p_2, \dots, p_n, I)$$

- These quantities solve the problem

$$\max U(x_1, \dots, x_n) \text{ s.t. } PX \leq I$$

and yield (indirect) utility

$$U(x_1^*(p_1, \dots, p_n, I), \dots, x_n^*(p_1, \dots, p_n, I)) \equiv V(p_1, \dots, p_n, I).$$

Indirect Utility Function

- The “Indirect Utility Function.”, $V(\cdot)$, is the value of maximized utility under given prices and income
- **Remember the distinction:**
 - Direct utility: utility from consumption of (x_1, \dots, x_n)
 - Indirect utility: utility obtained when facing (p_1, \dots, p_n, I)

Indirect Utility Function

- The consumer's choice problem

$$\begin{aligned}\max U(x, y) &= x^5 y^5 \\ s.t. p_x x + p_y y &\leq I\end{aligned}$$

Indirect Utility Function

- The consumer's choice problem

$$\begin{aligned}\max U(x, y) &= x^5 y^5 \\ s.t. p_x x + p_y y &\leq I\end{aligned}$$

- Write the Lagrangian

$$L = x^5 y^5 + \lambda(I - p_x x - p_y y)$$

Indirect Utility Function

- The consumer's choice problem

$$\begin{aligned}\max U(x, y) &= x^5 y^5 \\ \text{s.t. } p_x x + p_y y &\leq I\end{aligned}$$

- Write the Lagrangian

$$L = x^5 y^5 + \lambda(I - p_x x - p_y y)$$

- Half of the budget goes to each good

$$x^*(p_x, p_y, I) = \frac{I}{2p_x}, y^*(p_x, p_y, I) = \frac{I}{2p_y}$$

Indirect Utility Function

- The consumer's choice problem

$$\begin{aligned}\max U(x, y) &= x^{.5}y^{.5} \\ \text{s.t. } p_x x + p_y y &\leq I\end{aligned}$$

- Write the Lagrangian

$$L = x^{.5}y^{.5} + \lambda(I - p_x x - p_y y)$$

- Half of the budget goes to each good

$$x^*(p_x, p_y, I) = \frac{I}{2p_x}, y^*(p_x, p_y, I) = \frac{I}{2p_y}$$

- Thus, a consumer with $U(x, y) = x^{0.5}y^{0.5}$, budget I , and facing prices p_x and p_y will choose x^* and y^* and obtain utility:

$$U(x^*, y^*) = \left(\frac{I}{2p_x}\right)^{.5} \left(\frac{I}{2p_y}\right)^{.5}.$$

Indirect Utility Function

- Thus, the indirect utility for this consumer is

$$V(p_x, p_y, I) = U(x^*(p_x, p_y, I), y^*(p_x, p_y, I)) = \left(\frac{I}{2p_x}\right)^{.5} \left(\frac{I}{2p_y}\right)^{.5}$$

- Why bother calculating the indirect utility function?

- It saves time
 - » Instead of recalculating the utility level for every set of prices and budget constraints, we can plug in prices and income to get consumer utility
 - Will be useful later for analyzing demand and consumer well-being

The Carte Blanche Principle

The Carte Blanche Principle

- Implication of consumer theory – consumers make optimal choices given
 - Prices, constraints, and income.
- Carte Blanche principle:
 - Consumers are always weakly better off receiving a cash transfer than an in-kind transfer of identical monetary value
 - Why?

In-Kind Transfers

- Examples of in-kind transfers given to U.S. citizens:
 - Food Stamps, housing vouchers, health insurance, subsidized educational loans, child care services, job training, etc.
- Economic theory suggests
 - Relative to equivalent cash transfer, in-kind transfers *constrains* consumer choice
 - If consumers are rational, constraints on choice cannot be beneficial
- Consider a consumer with income $I = 100$ choosing between food and housing at normalized prices $p_f = 1, p_h = 1$ per unit:

$$\begin{aligned} & \max_{f,h} U(f, h) \\ & \text{s.t. } f + h \leq 100 \end{aligned}$$

In-Kind Transfers

- The government decides to provide a housing subsidy of 50
 - Consumer can now purchase up to 150 units of housing but no more than 100 units of food
- The consumer's problem is:

$$\begin{aligned} & \max_{f,h} U(f, h) \\ \text{s.t. } & f + h \leq 150 \\ & h \geq 50 \end{aligned}$$

- Alternatively, if the government had provided 50 dollars in cash, the problem would be:

$$\begin{aligned} & \max_{f,h} U(f, h) \\ \text{s.t. } & f + h \leq 150. \end{aligned}$$

In-Kind Transfers

- The government's transfer therefore has two components:
 1. An expansion of the budget set from I to $I' = I + 50$.
 2. The imposition of the constraint that $h \geq 50$.
- The canonical economist's question is:

Why do both (1) and (2) when you can just do (1) and potentially improve consumer welfare at no additional cost to the government?

Preference question: Cash versus in-kind transfers?

Please consider the following program that the federal government is considering permanently adopting to help low-income Americans. The program would be funded by an across-the-board income-tax rate increase.

Figure A-1

Benefit Offered	Every year, each American below the poverty line receives \$2,000, in a separate account, that can be used to pay for healthcare, housing, and food costs only.
Total Cost	\$2,000 per year per American below the poverty line.

Figure A-2

Benefit Offered	Every year, each American below the poverty line receives \$2,000 in cash to spend on whatever they choose.
Total Cost	\$2,000 per year per American below the poverty line.

Congress has decided to give \$2K annually to every adult every citizen whose income is below the poverty level. Would you prefer that...

- A The \$2K can be spent only on necessities: *Housing, transportation, food-at-home, clothing, utilities, healthcare, and education*
- B The \$2K can be spent as desired (unrestricted cash)
- C No preference
- D Other (please be prepared to explain)

**The demand for subsidized health insurance (Finkelstein,
Hendren, and Shepard, 2019)**

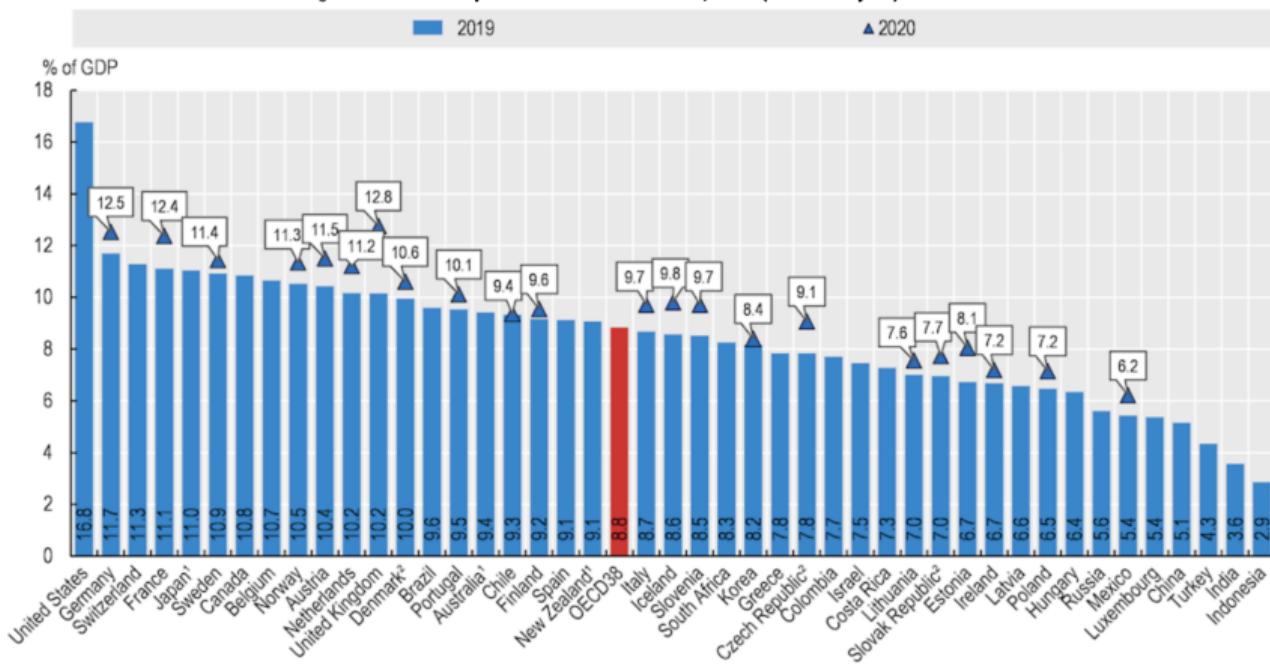
Health insurance provision in the United States

Relative to other industrialized countries, U.S. has unique institutional arrangements for providing healthcare and health insurance

1. Spends a far larger share of Gross Domestic Product on healthcare than any other country
2. Health insurance for working-age adults is primarily provided through employers as a 'fringe benefit' rather than through either a public insurance system or a direct-to-household system
3. A substantial fraction of U.S. adults lacks health insurance

Annual health care expenditure as a share of GDP across OECD countries

Figure 7.1. Health expenditure as a share of GDP, 2019 (or nearest year) and 2020



1. OECD estimates for 2019. 2. OECD estimates for 2020.

Source: OECD Health Statistics 2021, WHO Global Health Expenditure Database.

Estimated fraction of U.S. nonelderly adults without health insurance

Figure 1

Number of Uninsured and Uninsured Rate among the Nonelderly Population, 2008-2019



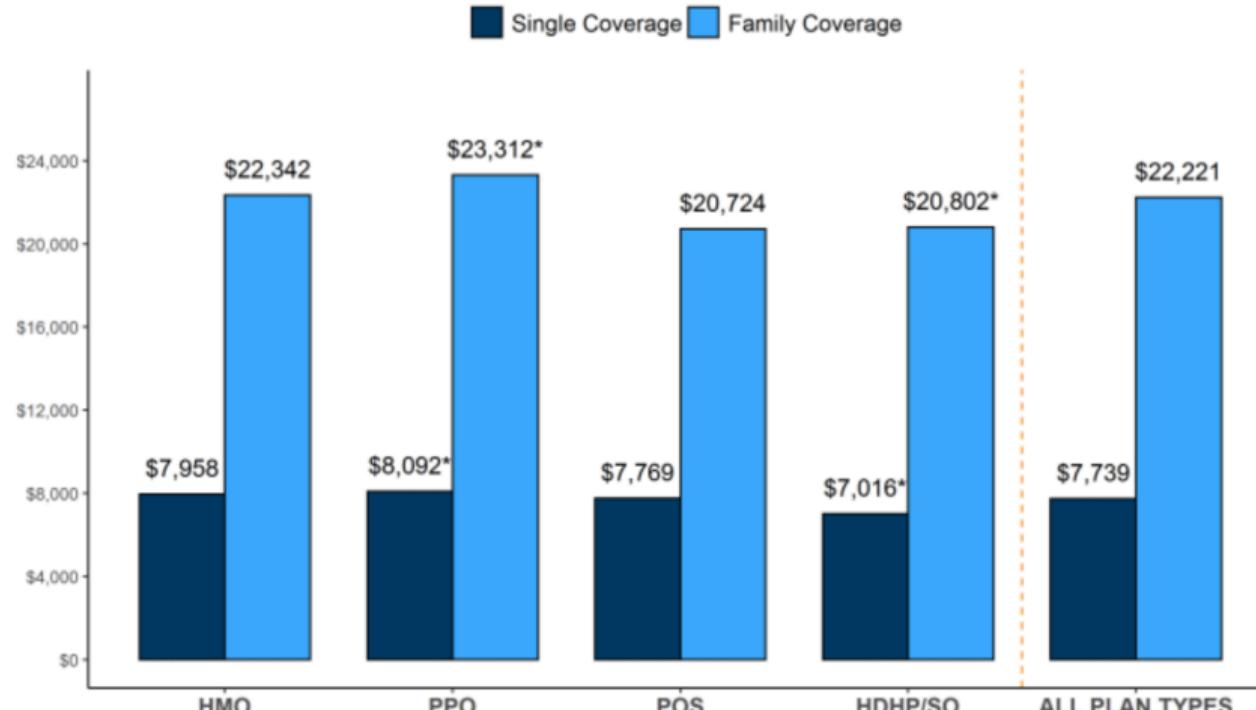
NOTE: Includes nonelderly individuals ages 0 to 64.

SOURCE: KFF analysis of 2008-2019 American Community Survey, 1-Year Estimates.

KFF

Consistent with high U.S. per capita healthcare expenditures, health insurance is quite expensive

Average Annual Premiums for Covered Workers, Single and Family Coverage, by Plan Type, 2021



Health insurance premium subsidies common in U.S.

The subsidy schedule for Massachusetts Commonwealth Care, 2009–2013

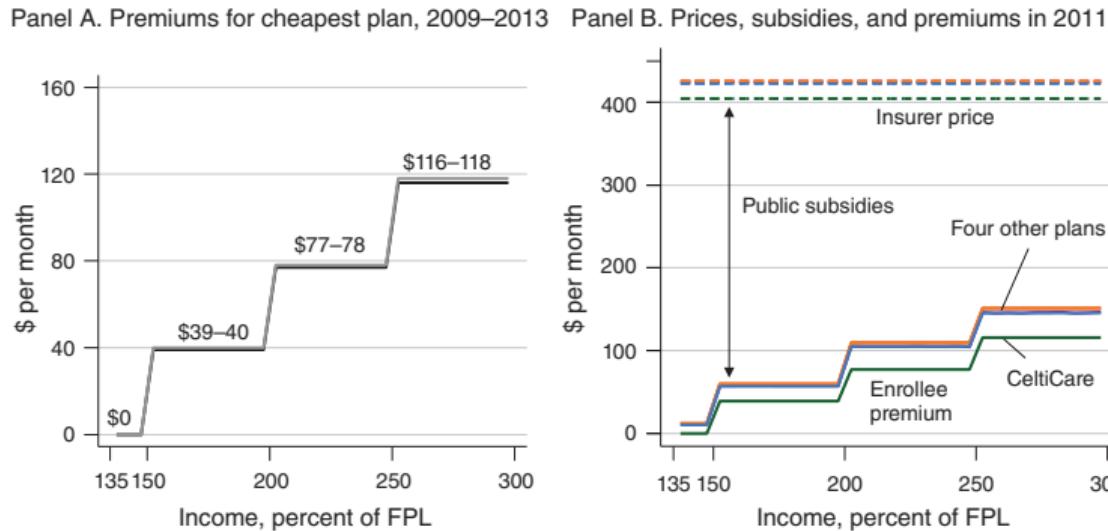


FIGURE 2. INSURER PRICES AND ENROLLEE PREMIUMS IN COMM CARE MARKET

Notes: Panel A plots enrollee premiums for the cheapest plan by income as a percent of FPL, noting the thresholds (150 percent, 200 percent, and 250 percent of FPL) where the amount increases discretely. The black lines show the values that applied in 2009–2012; the gray lines show the (slightly higher) values for 2013. Panel B shows insurer prices (dotted lines) and enrollee premiums (solid lines) for the five plans in 2011. In this year, four insurers set prices within \$3 of a \$426/month price cap, while CeltiCare set a lower price (\$405) and therefore had lower enrollee premiums.

Subsidizing health insurance premiums: Questions for discussion

1. Why should (or why do) governments subsidize health insurance premiums?

Subsidizing health insurance premiums: Questions for discussion

1. Why should (or why do) governments subsidize health insurance premiums?
2. Is this an in-kind transfer (like food stamps, AKA snap)?

Subsidizing health insurance premiums: Questions for discussion

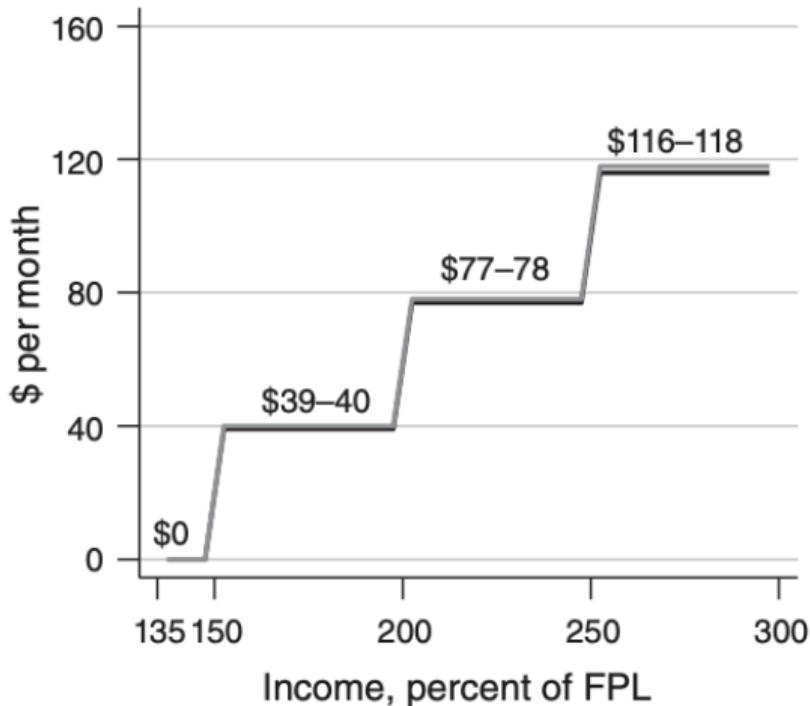
1. Why should (or why do) governments subsidize health insurance premiums?
2. Is this an in-kind transfer (like food stamps, AKA snap)?
3. Would 'cashing out' the subsidy be a better policy?

Subsidizing health insurance premiums: Questions for discussion

1. Why should (or why do) governments subsidize health insurance premiums?
2. Is this an in-kind transfer (like food stamps, AKA snap)?
3. Would 'cashing out' the subsidy be a better policy?
4. What information would you like to have available to aid your decision?

Why is the jumpy subsidy schedule useful for learning about WTP for healthcare?

Panel A. Premiums for cheapest plan, 2009–2013



Interlude: Using discontinuities to learn about causal effects

Using discontinuities to learn about causal effects

- Arbitrary cutoffs are necessary for administration
- Why are they useful for economists?

Using discontinuities to learn about causal effects

- Arbitrary cutoffs are necessary for administration
- Why are they useful for economists?
- Define a variable X that is used to determine the cutoff above/below which a person (or unit) i is or is not assigned to treatment.
 - X could be the percentage of voters for candidate A
 - X could be the exact hour/minute/second of birth.
- We will refer to X as the *running variable*, and we'd like that variable to be continuous

Using discontinuities to learn about causal effects

- Imagine there are two underlying relationships between potential outcomes and treatment, represented by $E[Y_{i1}|X_i]$ and $E[Y_{i0}|X_i]$

Using discontinuities to learn about causal effects

- Imagine there are two underlying relationships between potential outcomes and treatment, represented by $E[Y_{i1}|X_i]$ and $E[Y_{i0}|X_i]$
- Thus at each value of X_i , the causal effect of treatment is

$$E[T|X_i = x] = E[Y_{i1}|X_i = x] - E[Y_{i0}|X_i = x]$$

Using discontinuities to learn about causal effects

- Imagine there are two underlying relationships between potential outcomes and treatment, represented by $E[Y_{i1}|X_i]$ and $E[Y_{i0}|X_i]$
- Thus at each value of X_i , the causal effect of treatment is
$$E[T|X_i = x] = E[Y_{i1}|X_i = x] - E[Y_{i0}|X_i = x]$$
- Let's say that individuals to the right of a cutoff c (e.g., $X_i \geq 0.5$) are exposed to treatment, while those to the left ($X_i < 0.5$) are denied treatment
- We therefore observe $E[Y_{i1}|X_i]$ to the right of the cutoff and $E[Y_{i0}|X_i]$ to the left of the cutoff

Relationship b/w GPA in Econ 1+2 and Econ major at UCSC in 2008-12

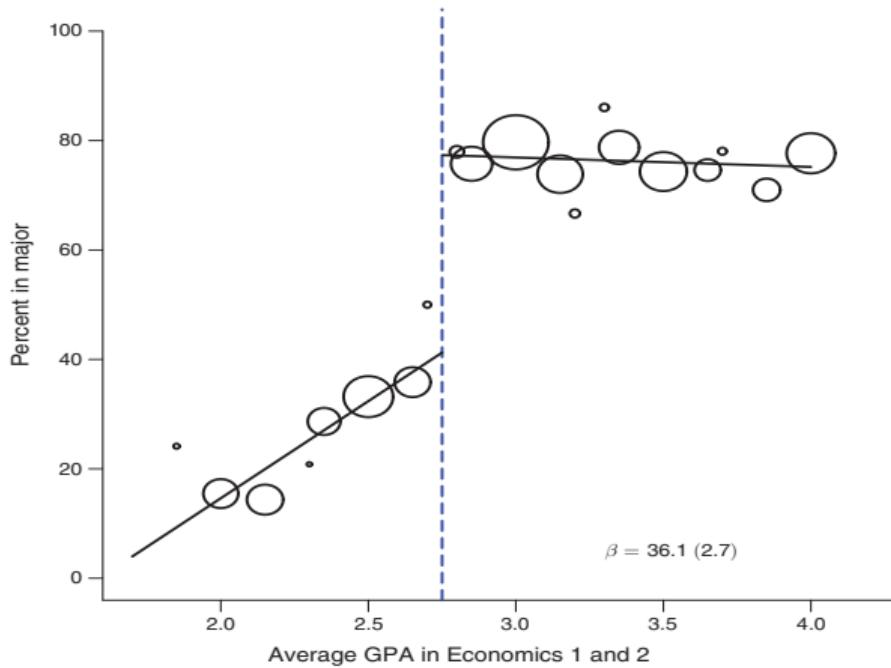


FIGURE 1. THE EFFECT OF THE UCSC ECONOMICS GPA THRESHOLD ON MAJORING IN ECONOMICS

Notes: Each circle represents the percent of economics majors (y-axis) among 2008–2012 UCSC students who earned a given EGPA in Economics 1 and 2 (x-axis). The size of each circle corresponds to the proportion of students who earned that EGPA. EGPA below 1.8 are omitted, leaving 2,839 students in the sample. Fit lines and beta estimate (at the 2.8 GPA threshold) from linear RD specification; standard error (clustered by EGPA) in parentheses.

Using discontinuities to learn about causal effects

- Consider units i that are arbitrarily close (within ε) to threshold. Plausibly:

$$\lim_{\varepsilon \downarrow 0} E[Y_{i1}|X_i = c + \varepsilon] = \lim_{\varepsilon \uparrow 0} E[Y_{i1}|X_i = c + \varepsilon],$$

$$\lim_{\varepsilon \downarrow 0} E[Y_{i0}|X_i = c + \varepsilon] = \lim_{\varepsilon \uparrow 0} E[Y_{i0}|X_i = c + \varepsilon].$$

- That is, for units that are *almost identical*, we may be willing to assume that had both been treated (or not treated), their outcomes would have been arbitrarily similar

Using discontinuities to learn about causal effects

- Consider units i that are arbitrarily close (within ε) to threshold. Plausibly:

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$$\lim_{\varepsilon \downarrow 0} E[Y_{i0}|X_i = c + \varepsilon] = \lim_{\varepsilon \uparrow 0} E[Y_{i0}|X_i = c + \varepsilon].$$

- That is, for units that are *almost identical*, we may be willing to assume that had both been treated (or not treated), their outcomes would have been arbitrarily similar
- If this assumption is plausible, we can form a **Regression Discontinuity** estimate of the causal effect of treatment on outcome Y using the contrast:

$$\hat{T} = \lim_{\varepsilon \downarrow 0} E[Y_i|X_i = c + \varepsilon] - \lim_{\varepsilon \uparrow 0} E[Y_i|X_i = c + \varepsilon],$$

Using discontinuities to learn about causal effects

- Consider units i that are arbitrarily close (within ε) to threshold. Plausibly:

$$\lim_{\varepsilon \downarrow 0} E[Y_{i1}|X_i = c + \varepsilon] = \lim_{\varepsilon \uparrow 0} E[Y_{i1}|X_i = c + \varepsilon],$$

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- That is, for units that are *almost identical*, we may be willing to assume that had both been treated (or not treated), their outcomes would have been arbitrarily similar
- If this assumption is plausible, we can form a **Regression Discontinuity** estimate of the causal effect of treatment on outcome Y using the contrast:

$$\hat{T} = \lim_{\varepsilon \downarrow 0} E[Y_i|X_i = c + \varepsilon] - \lim_{\varepsilon \uparrow 0} E[Y_i|X_i = c + \varepsilon],$$

which in the limit is equal to:

$$T = E[Y_{i1} - Y_{i0}|X_i = c]$$

Tada! Our regression discontinuity estimator

GPA in Econ 1+2 in '07/08 v. annual earnings '17/18, UCSC ugrads

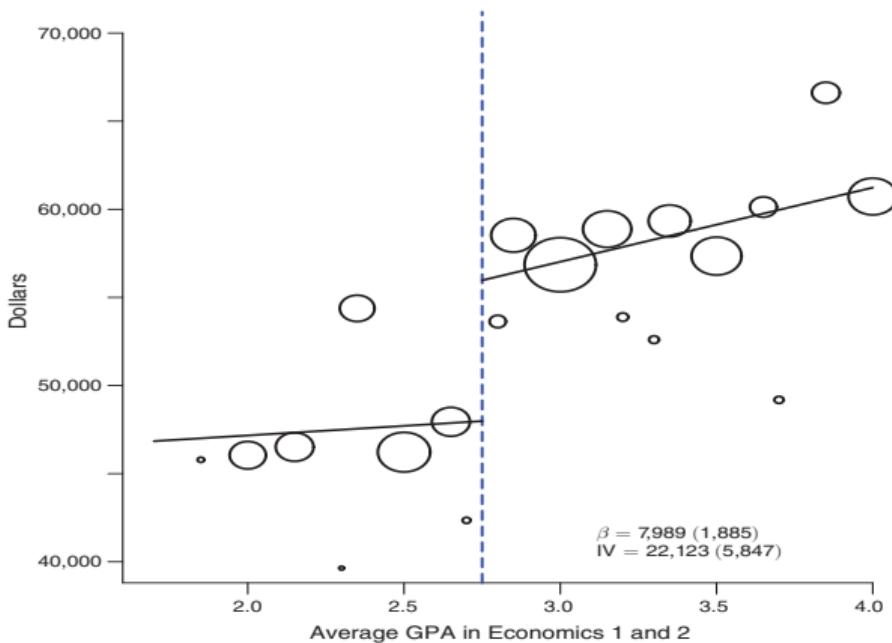


FIGURE 2. THE EFFECT OF THE UCSC ECONOMICS GPA THRESHOLD ON ANNUAL WAGES

Notes: Each circle represents the mean 2017–2018 wages (y-axis) among 2008–2012 UCSC students who earned a given EGPA in Economics 1 and 2 (x-axis). The size of each circle corresponds to the proportion of students who earned that EGPA. 2017–2018 wages are the mean EDD-covered California wages in those years, omitting zeroes. Wages are CPI adjusted to 2018 and winsorized at 2 percent above and below. EGPAAs below 1.8 are omitted, leaving 2,446 students with observed wages. Fit lines and beta estimate (at the 2.8 GPA threshold) from linear RD specification and instrumental variable specification (with majoring in economics as the endogenous variable); standard errors (clustered by EGPA) in parentheses.

Back to Massachusetts CommCare

Sharp drops in health insurance enrollment at subsidy discontinuities

Panel A. Average monthly enrollment by income

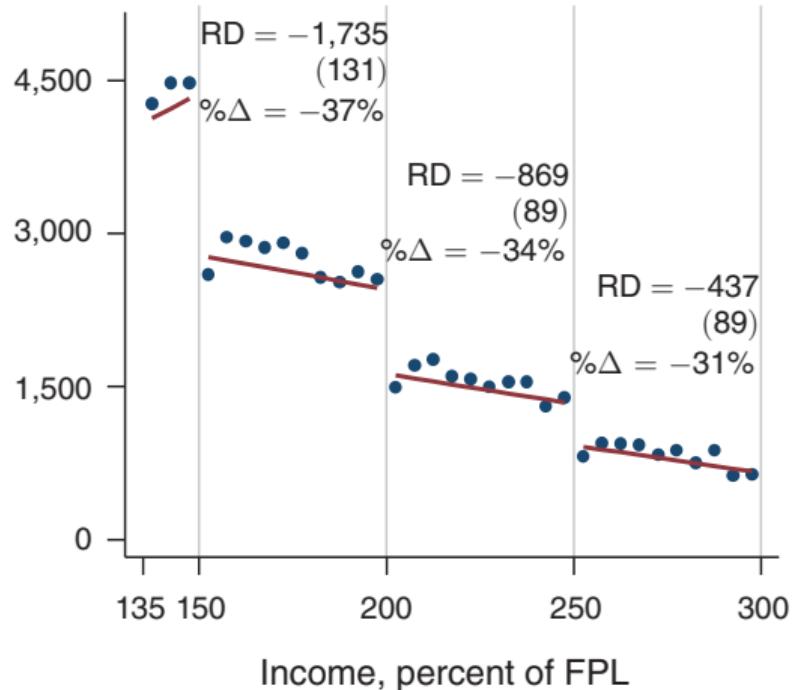


FIGURE 5. COMM CARE ENROLLMENT AND AVERAGE INSURER COSTS, 2009–2013

Enrollment in MA Commonwealth Care among the eligible population

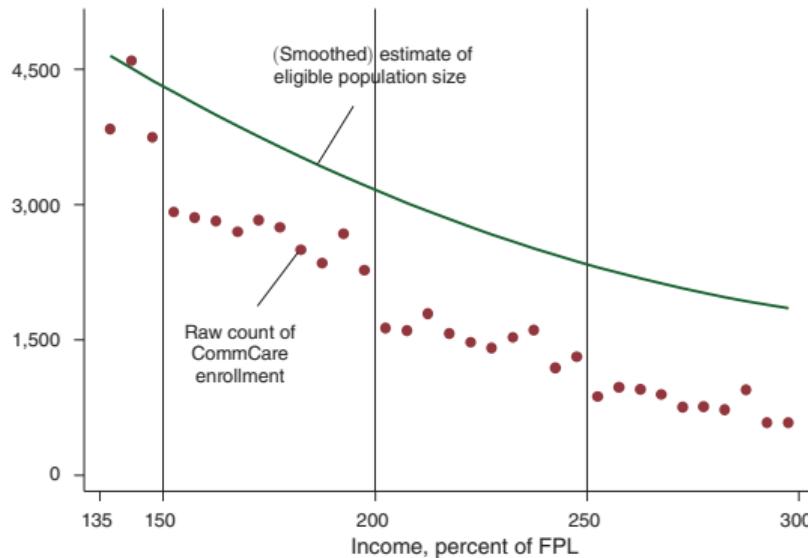
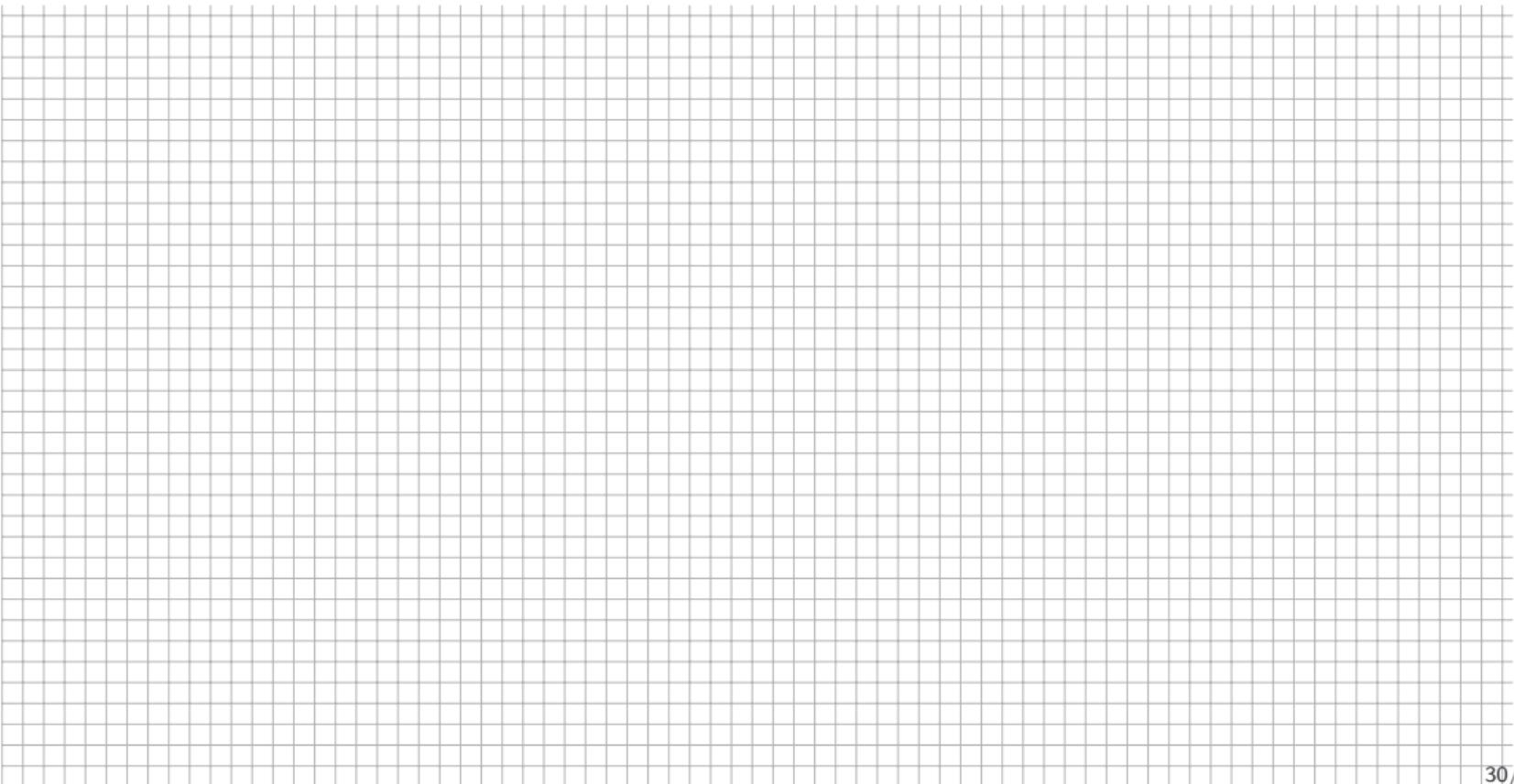


FIGURE 4. ELIGIBLE AND ENROLLED POPULATION, 2011

Notes: Figure shows our (smoothed) estimate of the CommCare-eligible population in 2011 (based on ACS data), and raw enrollment counts in CommCare in 2011 by bins of 5 percent of the FPL.

Visualizing Willingness to Pay in the Consumer Preference Diagram



Estimated H.I. demand curve: Commcare-eligible adults

Panel A. W_L (based on $1 - D_U$)

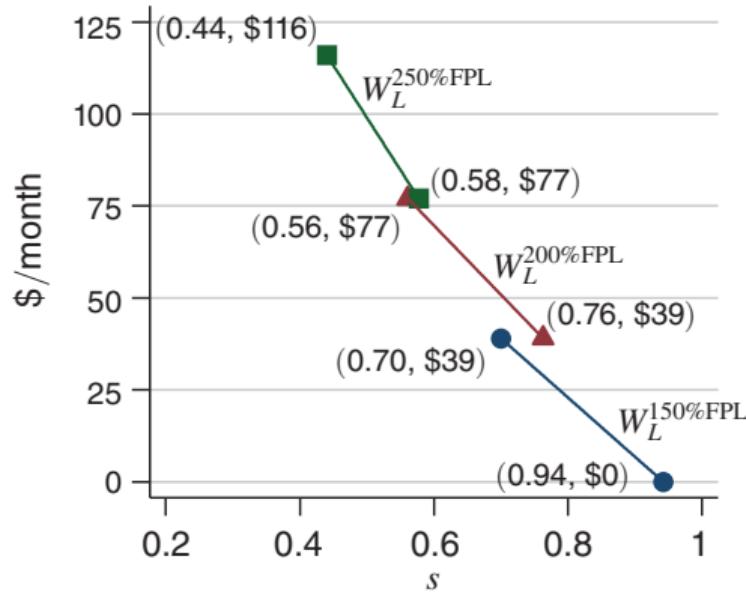


FIGURE 10. WILLINGNESS TO PAY CURVES: EMPIRICAL

Estimated H.I. demand curve: Commcare-eligible adults

Panel C. Adjusted W_L

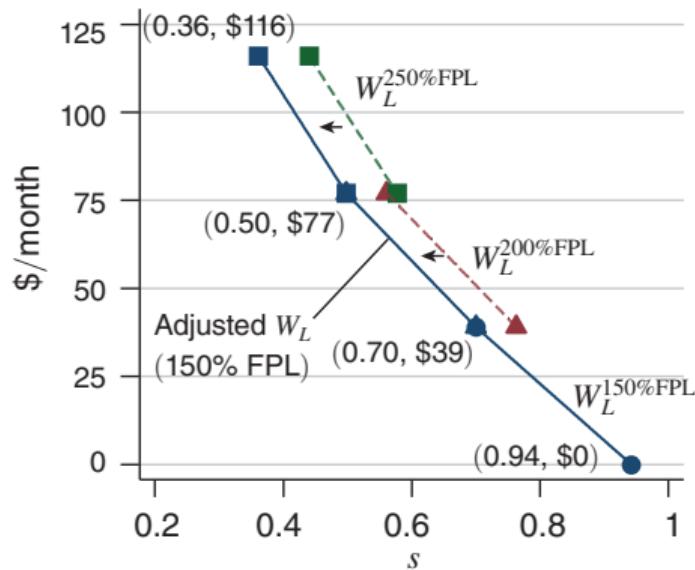


FIGURE 10. WILLINGNESS TO PAY CURVES: EMPIRICAL

Takeaways

1. How much value do beneficiaries value subsidized insurance?
2. Why don't beneficiaries value it more?
3. Would they be better off with the equivalent amount of cash?
4. Why do governments (and voters) insist on giving in-kind subsidies rather than cash transfers?

Why Is So Much Redistribution In-Kind and Not in Cash? Evidence from a Survey Experiment

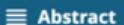
Zachary Liscow and Abigail Pershing



PDF



PDF PLUS



Abstract



Full Text



Supplemental Material



Abstract

Economists often point to the superiority of cash over in-kind transfers as a means of redistribution because recipients can choose how to use these resources. However, among the trillions of dollars of annual US transfers, redistribution is mostly in-kind. We conducted a survey experiment to help explain why.

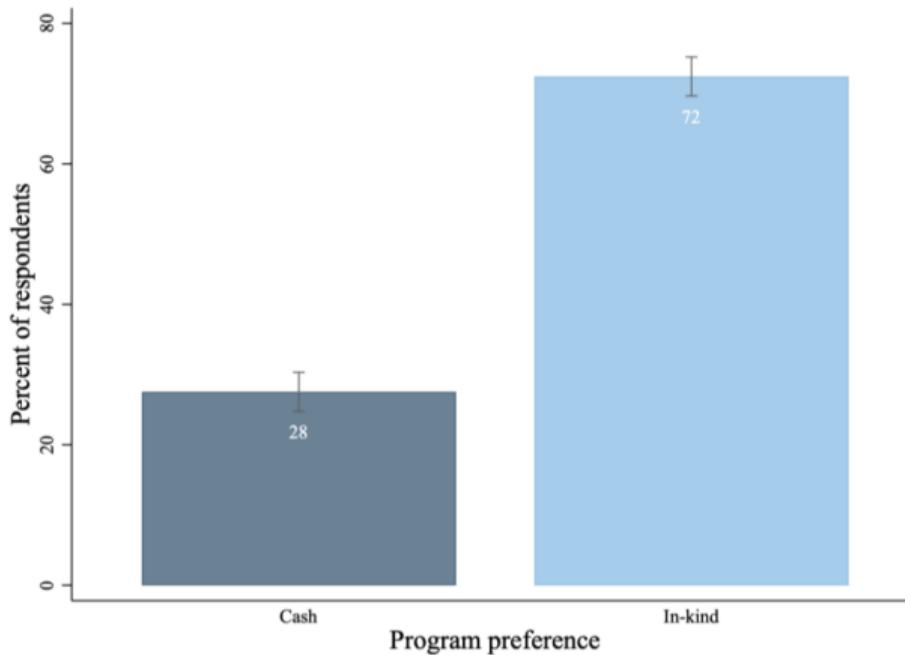


National Tax Journal
Volume 75, Number 2
June 2022

Table A1. Survey Demographics: Survey Percentages and Test of Difference with US Population

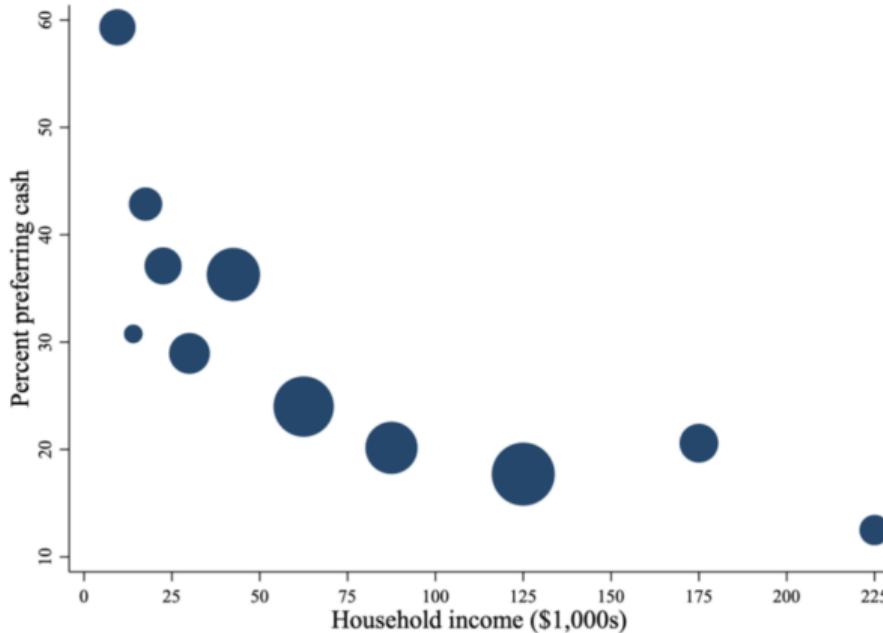
	US Population	Treatment				Yale Sample
		Control	Economics	Rights	Poor Spending	
Age						
18-34	30	30 (.98)	30 (.81)	30 (.95)	29 (.63)	98 (.00)
35-44	16	17 (.55)	17 (.84)	16 (.85)	16 (.82)	2 (.00)
45-54	16	17 (.92)	16 (.98)	16 (.80)	17 (.95)	0 (.00)
55-64	17	17 (.88)	17 (.97)	16 (.84)	18 (.43)	0 (.00)
65+	21	20 (.59)	21 (.92)	22 (.52)	20 (.95)	0 (.00)
Race						
White	60	58 (.31)	61 (.65)	61 (.64)	62 (.45)	63 (.48)
Hispanic/Latino	18	20 (.05)	18 (.92)	18 (.80)	17 (.76)	16 (.19)
Black	12	12 (.98)	12 (.85)	12 (.88)	11 (.99)	5 (.01)
Asian/Pacific Islander	6	6 (.42)	6 (.90)	6 (.61)	6 (.94)	11 (.00)
Other	4	3 (.00)	3 (.09)	4 (.23)	4 (.12)	5 (.11)
Gender						
Female	51	50 (.72)	51 (.83)	51 (.84)	49 (.31)	57 (.00)
Income						
Under \$25,000	19	19 (.72)	19 (.95)	19 (.84)	19 (.77)	6 (.00)
\$25,000-\$50,000	21	21 (.94)	21 (.91)	21 (1.00)	21 (.72)	4 (.00)
\$50,000-\$75,000	17	17 (.93)	17 (.92)	17 (.88)	17 (.85)	8 (.00)
\$75,000-\$100,000	13	13 (.68)	13 (.80)	13 (.88)	12 (.91)	9 (.07)
\$100,000+	30	30 (.90)	30 (.96)	30 (.87)	31 (.87)	72 (.00)
Political affiliation						
Republican	28	28 (.99)	28 (.99)	27 (.74)	29 (.70)	5 (.00)
Democrat	29	30 (.70)	29 (.91)	30 (.48)	28 (.61)	80 (.00)
Independent	41	40 (.49)	41 (.97)	40 (.67)	40 (.58)	9 (.00)
Education						
HS graduate or less	40	36 (.00)	37 (.10)	36 (.07)	40 (.87)	1 (.00)
Some college+	60	64 (.00)	63 (.10)	63 (.07)	60 (.87)	99 (.00)
Sample Size	1029	505	519	527	184	

Figure 1. Preference Between Cash and In-Kind Programs – General Population



Notes: The figure shows the percent of respondents preferring each of the cash and in-kind programs, when respondents are asked to choose between them. The thin bars mark 95 percent confidence intervals. Data are from control survey.

Figure A3. Preference for Cash by Income – General Population



Notes: This figure illustrates the percent preferring cash in each income bracket. Marker size is proportional to the number of observations in the income bracket, and markers are located at the midpoint of each income bracket. The coefficient of this regression is -0.16 with standard error = 0.02 (-12.53 and 1.71 respectively when using log(income)). Data are from the control survey.

Subjective beliefs question: How do the poor spend their money?

How Respondents Think the Poor Spend Money [asked in all but the below-poverty survey]

41. What percent of a cash benefit from the government do you think Americans below the poverty line would spend on necessities? Please assume that “necessities” means housing, transportation, food at home, clothing, utilities, healthcare, and education.

Slider from 0 to 100

Liscow & Pershing, 2022

What percent of the \$2K cash benefit do you think Americans below the poverty line would spend on necessities?

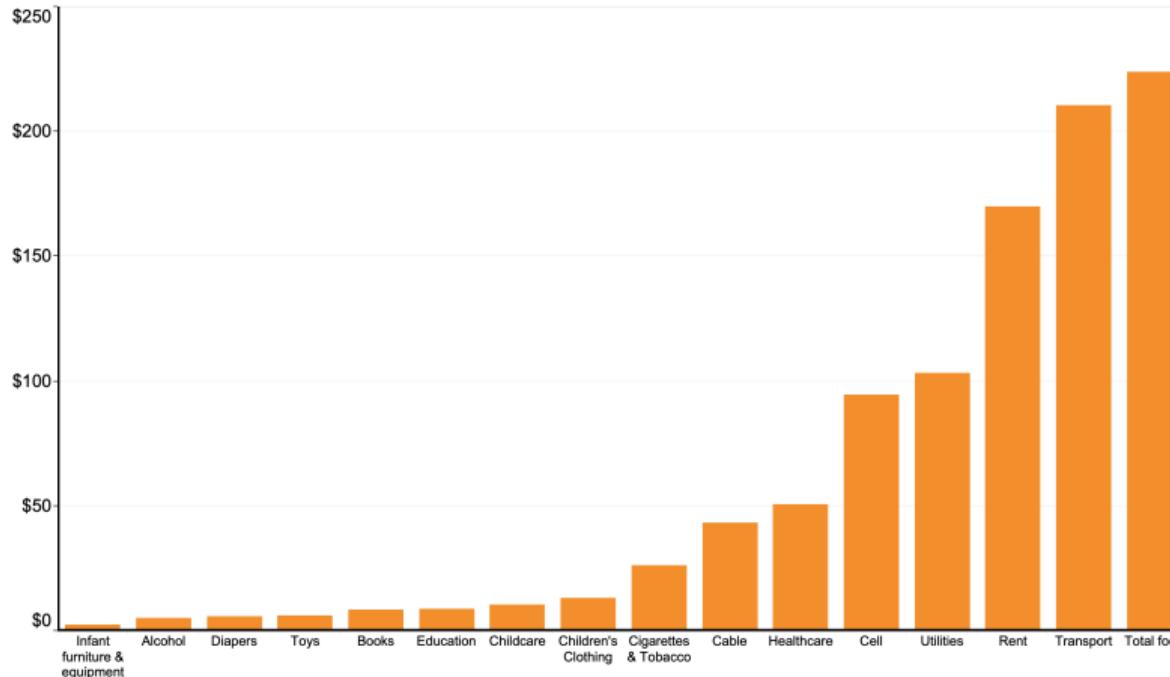
Necessities means housing, transportation, food-at-home, clothing, utilities, healthcare, and education

- A 0 - 25 %
- B 26 - 50%
- C 51 - 75%
- D 75 - 100%

Families living at/near poverty spend about 75% of income on food, transportation, rent, utilities, cellphone service

AVERAGE MONTHLY EXPENDITURES

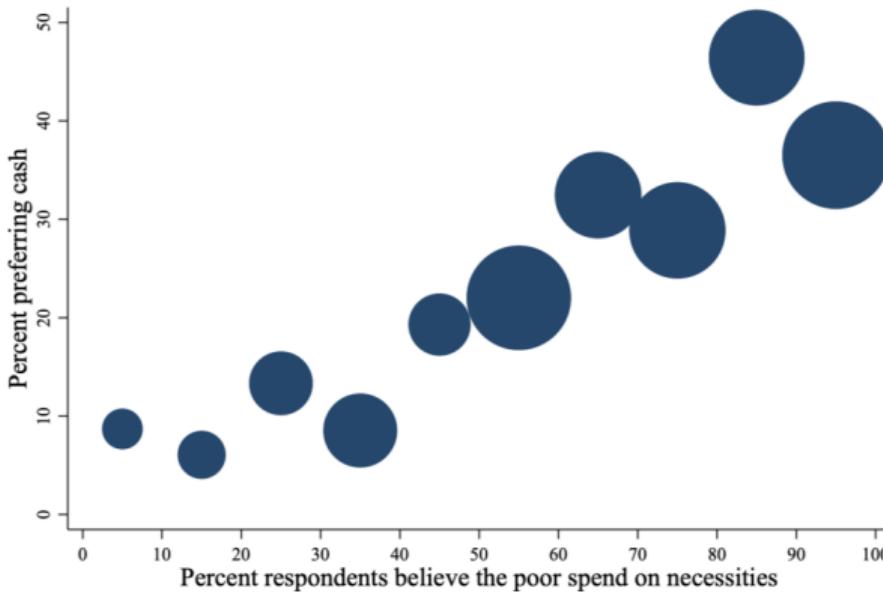
Across all households at less than 200% of the federal poverty line and with at least one child, 2015-2019



Source: Consumer Expenditure Survey, U.S. Census Bureau

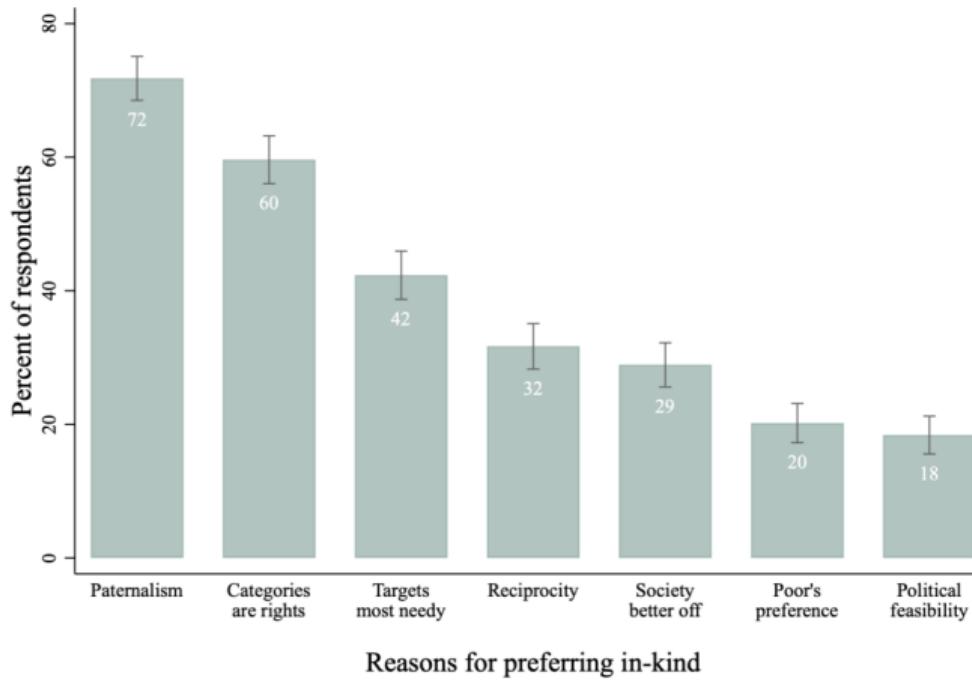
EconoFact econofact.org

Figure 2. Relationship Between Program Preference and Perception of the Poor's Spending Habits – General Population



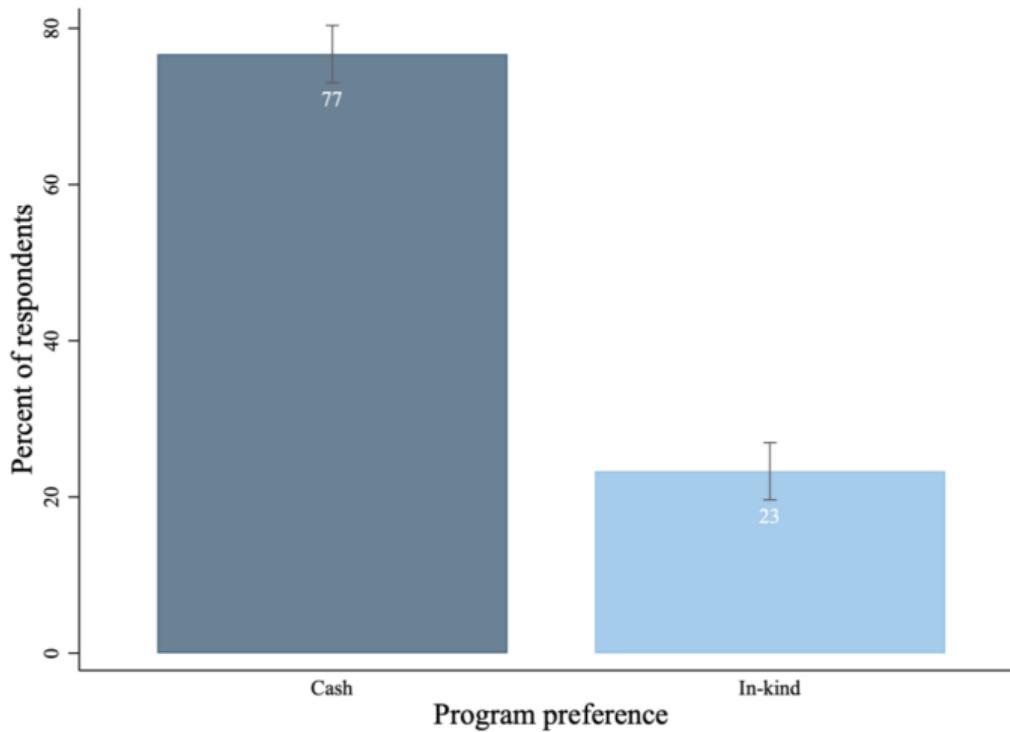
Notes: This graph shows the preference for the cash program, by respondents' perception of how much out of a cash transfer the poor would spend on necessities. Marker size is proportional to the number of observations in each decile of perceived spending on necessities. The coefficient from the regression of preferring cash on perceived spending is 0.42 (SE = 0.05). Data are from control survey.

Figure 3.a. Reasons Given for Preferring In-Kind – General Population



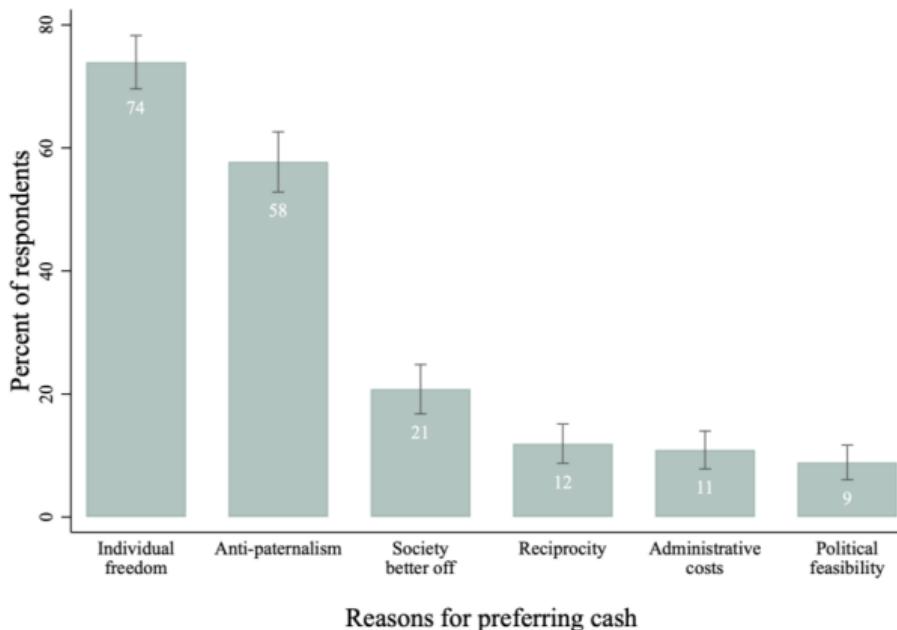
Notes: This figure shows the percentage of respondents who selected each reason for preferring in-kind, by order of popularity. “Other (please specify)” was also displayed as an option; it was chosen by 3 percent of respondents. The thin bars mark 95 percent confidence intervals. Observations are respondents preferring in-kind in the control survey.

Figure 5. Preference Between Cash and In-Kind Programs – Below-Poverty Survey



Notes: The figure shows the percent preferring each of the cash program and the in-kind program, when respondents in the below-poverty survey are asked to choose between them. The thin bars mark 95 percent confidence intervals.

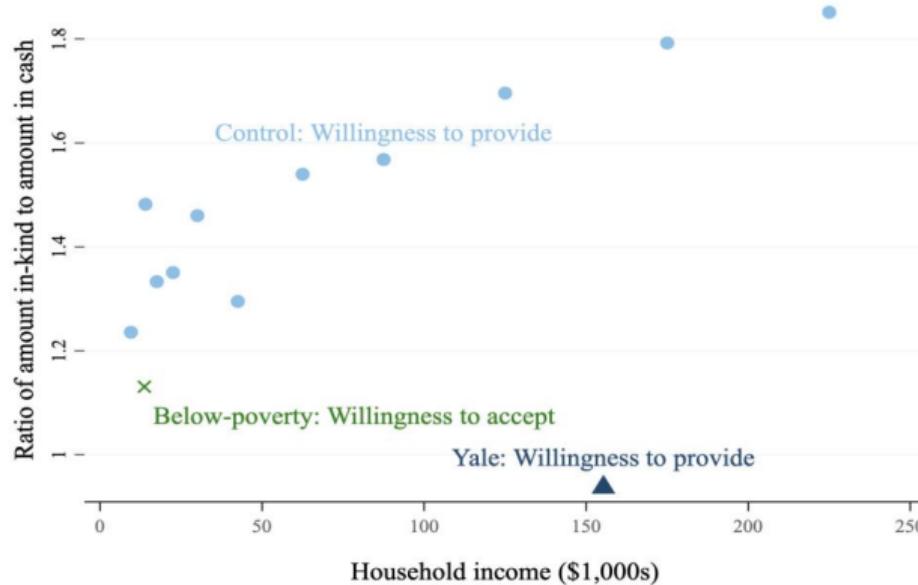
Figure 6.b. Reasons Given for Preferring Cash as Recipient – Below-Poverty Survey



Notes: The figure shows the support for each of the reasonings offered in the below-poverty survey for preferring cash, in order of popularity. “Other (please specify)” was also displayed as an option; it was selected by 4 percent of respondents. The thin bars mark 95 percent confidence intervals.

Solving for the political equilibrium

Figure 7. Willingness to Provide or Accept In-Kind vs. Cash Transfers



- Poor value in-kind transfers at approx \$0.80 per dollar
- Affluent households willing to provide \$1.20 – \$1.80 in in-kind transfers per dollar of cash