14.472 Public Finance II
Redistribution: Frameworks

Amy Finkelstein

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Road Map - Redistribution (Unit VI)

- **Frameworks:**
  - Basic welfare economics (Kaplow)
  - Marginal Value of Public Funds (Hendren)
  - Self-targeting (Nichols and Zeckhauser; Currie and Gahvari)

- **Topics:**
  - Cash vs. In Kind Transfers: Why would we ever redistribute in-kind?
  - Low take-up of benefits: Is it "a problem"

- **Empirical application:** Subsidizing health insurance for low-income adults
  - Empirical challenge: measuring WTP for an in kind good not traded in well functioning markets
  - Conceptual challenge: how to use estimates of WTP - what benchmarks?
Road Map: Basic Welfare Economics

- Social welfare functions and social preferences for redistribution
  - SWFs
  - Sources of Concavity
- Welfarism and the Pareto Principle
  - Two-level moral theory
Social Welfare Functions and Social Preferences for Redistribution

- Social Welfare Function $SW(x)$ indicates how a social state $x$ is evaluated.
- Individualistic Social Welfare Function (a.k.a "welfarism")
  - Social welfare depends only on individuals’ utility
    \[ SW(x) = W(u_1(x), ..., u_n(x)) \]
- Only arguments in social welfare function are individual utilities
- Normative premise: only relevant aspect of a regime is the manner in which it affects each individual’s well-being (Sen 1977, 1979)
Individualistic social welfare function

- Social welfare depends only on individuals’ utility
  \[ SW(x) = W(u_1(x), ..., u_n(x)) \]

- What restrictions does this impose?
  - No arguments enter \( W \) directly - only through individual utilities.
    - All social relevance can be traded to effects on individuals’ welfare
    - i.e. precludes "society values...", "society cares about..."
  - Things \textit{only matter} through their impact on individuals’ utilties, and \textit{how they matter} depends entirely on how they affect individuals’ utilities

- Implication: notions of "fairness" or "equity" have no role unless they are concerned with the distribution of utility or they are in some respect a proxy for effects on utility
  - More to come...
Sources of Concavity

\[ SW(x) = W(u_1(x), \ldots, u_n(x)) \]

- Common to use an additive social welfare function

\[ SW(x) = \int W(u_i(x)) f(i) di \]

- Additive SWF does not necessarily mean utilitarian SWF
Sources of Concavity

\[ SW(x) = \int W(u_i(x)) f(i) di \]

- Useful formulation (Stern 1976, optimal taxation SWF)

\[ SW(x) = \begin{cases} \int \frac{u_i(x)^{1-e}}{1-e} f(i) di & \text{for } e \neq 1 \\ \int \ln u_i(x) f(i) di & \text{for } e = 1 \end{cases} \]

where \( e \geq 0 \) indicates degree of aversion to inequality in the distribution of utility levels
Sources of Concavity

- Two sources of convexity

\[
SW(x) = \begin{cases} 
\int \frac{u_i(x)^{1-e}}{1-e} f(i) \, di & \text{for } e \neq 1 \\
\int \ln u_i(x) f(i) \, di & \text{for } e = 1 
\end{cases}
\]

- \(u_i(x)\): utility function with its own concavity
- \(e\): inequality aversion parameter
Two sources of Concavity

\[ SW(x) = \begin{cases} \int u_i(x)^{1-e} f(i) \, di & \text{for } e \neq 1 \\ \int \ln u_i(x) f(i) \, di & \text{for } e = 1 \end{cases} \]

- \( u_i(x) \) - utility function with its own concavity
  - All that matters if Utilitarian SWF \((e = 0)\)
- Generates preference for equalizing consumption:
  - consider CRRA utility: \( u(c) = \frac{c^{1-\sigma}}{1-\sigma} \)
  - \( u'(c) = \frac{1}{c^{\sigma}} \)
  - Example: suppose \( \sigma = 2 \),
    - Now marginal utility is inversely proportion to the square of consumption
    - consider marginal utility of consumption at 10k and 1 million
- Note: extent of concavity of utility function is an empirical question (see attempts to estimate risk aversion!)
Two sources of Concavity

\[ SW(x) = \begin{cases} \int \frac{u_i(x)^{1-e}}{1-e} f(i) di & \text{for } e \neq 1 \\ \int \ln u_i(x) f(i) di & \text{for } e = 1 \end{cases} \]

- **e**: inequality aversion parameter
  - Additional (or reduced) curvature in the SWF itself
- **e = 0** indicates social welfare is sum of utilities ("utilitarianism")
- \( \lim_{e \to \infty} SW(x) \) is Rawlsian ("maximin") in which all weight is placed on the utility of the least well-off individual
- Note: this is a *value judgement*
Inequality aversion

- $e$: inequality aversion parameter
  - Additional (or reduced) curvature in the SWF itself
- Note: this is a *value judgement*
- But efforts to examine what inequality aversion is empirically
  - e.g. Kuziemko et al. (2015 AER) "How Elastic are Preferences for Redistribution"
    - uses on-line surveys to try to elicit preferences for redistribution and how they can be affected by the information provided
  - e.g. Jacobs et al. (2017 JPubEc) "Revealed social preferences of Dutch political parties"
    - uses election proposals and inverse optimum method to reveal / back out implicit preferences that make the proposal optimal
Two sources of Concavity: Comment

\[ SW(x) = \begin{cases} \int \frac{u_i(x)^{1-e}}{1-e} f(i) di & \text{for } e \neq 1 \\ \int \ln u_i(x) f(i) di & \text{for } e = 1 \end{cases} \]

- The more concave are individuals’ utility functions, the less relevant will be the degree of concavity in social welfare as a function of individuals’ utility
- e.g. a utilitarian SWF with a lot of concavity in the individual utility function might get pretty close to Rawlsian SWF with less concavity in individual utility function
Recall definition: SWF depends on *and only on* individuals’ utilities.

Motivation (Singer 1988) "But how can something *matter* if it does not matter *to anyone*, or to any group of beings?"


i.e. would be willing to making everyone worse off to increase SW

Intuition:

- non-individualistic SWF must give weight to a factor, independent of its effects on individuals’ well-being
- compare a given social state to another that is identical except in two respects:
  - it is inferior with respect to the nonutility factor and,
  - every individual is ever-so-slightly better off (due to having a bit more of some good)
Objective (external) notions of "the good" all violate the Pareto Principle

- Sen focuses on "capabilities" - e.g. nourishment, shelter, physical mobility, ability to take part of the life of the community
- Rawls considers "primary goods" - including rights and liberties, opportunities and powers, and income and wealth.
- "Merit" goods (e.g. education, health care)
Rejoinder I: So what?

- What "rule" says we can't violate the Pareto Principle?
- Is it all just semantics?
  - i.e. rather than stick that extra argument directly in SW function, stick it in some people’s utility function ("some people care about...")
  - implications for redistribution (see e.g. universal health insurance)
Rejoinder II: Other moral principles

What about values of freedom, autonomy, fairness, norms of common morality etc

- Breaking a promise is "wrong" even if does not have detrimental consequences
- Rewards and punishments should reflect merit or desert, even if there is no incentive benefits

Reconciling "other moral principles" with individualistic social welfare theory:

- Two-Level Moral Theory (see especially Hare 1981)
Two-Level Moral Theory

- Basic Idea: distinguish between two different levels a moral theory might operate at
  - Higher / Fundamental Level: What is the ultimate criterion of the social good? i.e. what is the correct SWF
  - Lower / Practical Level: What policy, rule, moral code should be implemented, in light of how society actually operates, to best advance the fundamental notion of the social good
    - i.e. recognizes that we are solving a constrained maximization problem

- Can explain why even an individualistic SWF might want rules / rights (e.g. "due process") that limit actors from freely maximizing the true, fundamental, social objective for fear that if permitted to do so they would not, producing less good in the end
Examples

Consider the question: "should the teacher strike the misbehaving student". Two very different questions:

- Higher / Fundamental Level: would this particular act raise social welfare, ceteris paribus
- Lower / Practical Level: Would a rule allowing / prohibiting such punishment raise social welfare?
  
  Compared to, say, a rule that encouraged teachers to use their discretion (which often would be exercised in the heat of the moment)?

Morality and social norms

- Use of rules in the realm of common morality, to regulate individuals’ informal interactions
- Sanctity of promises, norms of fair division (to reduce conflict), principles of retribution (to deter aggression)
Criteria for good tax system: equity, efficiency, simplicity, administratibility

- If taken as first principles, deserving *independent weight* they violate the Pareto principle
- But perhaps may serve as a second - level practical rule of thumb to maximize an individualistic SWF

Measures of poverty and inequality

- Normative: No purpose unless redundant of SWF
Road Map: Redistribution Frameworks

- Basic welfare economics (Kaplow) [done]
- Marginal Value of Public Funds (Hendren) [up next]
- Self Targeting (Nichols and Zeckhauser; Currie and Gahvari)
Empirical welfare analysis: MVPF

- Key readings: Hendren (2016) "policy elasticity" and Hendren (2017) "Efficient welfare weights"
- See also my interpretation / cliff notes
"Credibility revolution" in applied economics (especially labor economics)

W(h)ither Public Finance?

- Many papers estimate the causal effects of public policies on various outcomes
- Labor economists may stop there, but public finance economists wants to analyze welfare impact of public policies
Reminder: Two canonical approaches to welfare analysis

- Marginal excess burden (MEB) / marginal deadweight loss
  - Harberger 1964; Auerbach 1985; Auerbach and Hines 2002
- Marginal Cost of Public Funds (MCPF)
Marginal Excess Burden (MEB)

- Marginal excess burden / marginal deadweight loss
  - Harberger: marginal DWL from tax increase is loss of (consumer + producer) surplus in excess of $ of tax revenue raised
  - Auerbach and Hines: marginal excess burden of a tax change is the difference between the Hicksian equivalent (or compensating depending on researcher’s preference) variation associated with the tax change and the change in tax revenue

- Conceptual "critique": MEB assumes an arbitrary and unrealistic thought experiment: individual lump sum taxation (a policy instrument that does not exist) is used to hold individual utility constant in face of a given policy change

- Empirical "critique" - need to estimate compensated elasticities (income effects non distortionary)
  - Goolsbee's lament: "The theory relates to compensated elasticities, whereas the natural experiments provide information primarily on uncompensated elasticities"
Marginal Cost of Public Funds (MCPF)

- Compare benefits to costs
  - Estimate and monetize the benefits from a policy change (e.g. improved test scores, better health, reduced pollution) and compare to "the cost" of the policy
  - "the cost" of the policy is expenditures on policy multiplied by (1+MCPF)

- MCPF intended to provide an adjustment to costs to account for distortionary cost of raising tax revenue to finance that expenditure
  - Thought to be ~0.3

- Conceptual "critique": does not account for how the money is raised
  - Obviously no single "cost of public funds".
  - Optimal tax literature (Diamond-Mirlees) emphasizes that the cost of raising revenue differs across the income distribution
  - Empirically, literature suggests cheaper to raise revenue from rich than poor (mirror image of Okun's "leaky bucket").
Goal: Map empirical estimates of causal effects of a policy change into welfare analysis of that policy change

Welfare analysis meets causal inference

Definition: Marginal Value of Public Funds on a Policy:

\[
MVPF = \frac{\text{"Benefit"}}{\text{"Cost"}}
\]

ratio of the beneficiaries’ willingness to pay (WTP) for the increase in expenditure out of their own income to the cost of the government of the increase in expenditure per beneficiary
Recall

\[ \text{MVPF} = \frac{"Benefit"}{"Cost"} \]

Examples: TANF, EITC

- Our object of interest: MVPF of a $1 increase in cash benefits

Useful to think of two classes of recipients:

- Inframarginals (I) who were already receiving cash transfer
- Marginals (M) who change their behavior in response to policy and become newly eligible for transfer (e.g. reduce labor supply to quality for TANF)

Useful to separately consider benefits and costs
Example: MVPF for a $1 increase in cash transfer

\[ MVPF = \frac{"Benefit"}{"Cost"} \]

- What is the benefit of $1 increase? (i.e. what is WTP for the $?)
  - Inframarginals: $1
  - Marginals: 0 by envelope theorem
    - If individuals are optimally choosing their behavior, marginal individual who changes her behavior in response to marginal change in policy is indifferent to behavioral change.
    - Therefore numerator = $1 ($1 times number of inframarginals)
- Note: So far we have not needed to estimate anything to calculate benefits (including any causal effects)
  - Let’s turn to costs...
MVPF for a $1 increase in cash benefit (con’t)

$$MVPF = \frac{''Benefit''}{''Cost''} = \frac{1}{1}$$

- What is the cost of $1 increase? Two types of costs
  - Mechanical cost: Increased govt expenditures holding behavior constant: $1
  - Fiscal externality: impact of any behavioral response to the policy on the government’s budget outlays.

- Fiscal externality, examples:
  - Reduce labor supply to become eligible for TANF, reducing government income tax revenue (and increasing TANF expenditures for marginal enrollees)
  - Changes in consumption (hence sales taxe revenue), health (hence public health care spending), crime etc etc.

- Cannot use envelope theorem to ignore these behavioral responses bc agents making (privately optimal) responses to policy do not internalize external effects of the policy on the government budget
MVPF for a $1 increase in cash benefit (con’t)

\[ MVPF = \frac{"Benefit"}{"Cost"} \]

- Recall Benefits: $I
- Recall two components of costs:
  - Mechanical cost ($I)
  - Fiscal externality
- Report MVPF normalized by mechanical cost ($I)
  - i.e. MVPF per $1 increase in mechanical expenditure per infra-marginal beneficiary

\[ MVPF^I = \frac{1}{1 + FE} \]

- where "FE" = fiscal externality = impact on government budget of the policy per dollar increase in mechanical expenditure on infra-marginal recipients
Fiscal externality (FE)

- Cannot invoke envelope theorem to ignore these behavioral responses
  - Agents making (privately optimal) behavioral changes in response to policy do not internalize *external effects of the policy on the government budget*
  - Causal effect of policy on government budget matters because of fiscal externality (recall derivation of Baily-Chetty)

- Fiscal externality is where welfare analysis meets causal inference
- Envelope theorem guarantees behavioral responses by individuals do not directly affect own utility
  - But if behavioral response had external effects on individuals besides recipients, these need to be taken into account
  - Not this could include other actors, not just government... to be continued..
Fiscal externality (FE)

- Fiscal externality can reduce costs below mechanical costs (e.g. improve health and reduce public spending on healthcare) or increase costs above mechanical cost.
- Fiscal externality can include behavioral responses to the program of both marginal and infra-marginal recipients.
  - e.g. infra-marginal recipients may change behavior (e.g. consumption and hence sales tax revenue) because of income effects.
Additional applications

- Welfare analysis of an increase of $1 of subsidy - same as above
- Welfare analysis of $1 of in-kind transfer (e.g. health insurance; food stamps)
  - Denote by $W$ the average inframarginal recipients’ WTP (out of own income) per dollar of in-kind benefit

\[ MVPF^$ = \frac{W}{1 + FE} \]

- $W$ may be less than or more than 1 (why?)
- Additional (considerable) empirical challenge: Estimating $W$ - we will return to this
How do we use the MVPF?

• Suppose we estimate the MVPF of a targeted cash transfer. Now what?
  • Is a MVPF of $0.8 or $1.3 "good"? "bad"?

• Consider two policies that have same distributional incidence - both transfer to group $i$
  • Then policy with higher MVPF is preferred - it is a lower cost way of enacting the transfer

• A key attraction of MVPF is that can do comparative welfare analysis across policies without taking a stand on individual utility function or social welfare function
  • e.g. do we want to use EITC or TANF to transfer to low income individuals?
  • Economists' comparative advantage is not defining societal objectives but rather, given a societal objective, trying to achieve it at lowest resource cost
How do we use the MVPF (con’t)?

- What about comparing MVPF across policies that don’t target same populations?
  - Hendren (2017): use "efficient welfare weights"
- Efficient welfare weight $\nu_i$ denotes MVPF of a $1$ income tax cut to individuals of income $i$
  - In other words, compare MVPF of a policy that transfers $1$ to income group $i$ to MVPF of a $1$ tax cut to same group
  - $\nu_i$ is cost of transferring $1$ to individuals of income $i$ through an income tax cut to them.
  - MVPF of tax cut is $1/(1+FE)$ where FE is impact of the tax cut on tax revenue via any behavioral response to tax cut.

- Why compare everything to transfers through income taxes?
  - Useful benchmark: spans what is arguably the most important form of heterogeneity in the population (differences in earnings potential)
 Efficient welfare weights (con’t)

- $\nu_i$: MVPF of transfering $1$ to income group $i$ through a tax cut
- Gives us a way of comparing MVPF of policy that transfers resources to income group $i$ compared to a policy that transfers to income group $j$ by “projecting” both policies onto the same population
- We prefer policy $i$ to policy $j$ if

$$MVPF_i \frac{\nu_j}{\nu_i} > MVPF_j$$

- Given that we can make transfers from $i$ to $j$ through the tax code, we can "turn" the policy targeted to $i$ into a comparable MVPF for a policy targeted to $j$ by multiplying by ratio of efficient welfare weights.
Efficient welfare weights also provide a way of evaluating a single policy.

- If policy targets income group $i$, relevant benchmark is to compare policy’s MVPF to $\nu_i$.
  - If policy’s MVPF exceeds $\nu_i$, there is a potential Pareto improvement: raise income taxes on group $i$ by $1$ and transfer it back to the group through the policy.

- Note: if had non distortionary taxation, natural comparison would be to compare MVPF to $1$ (Kaldor-Hicks efficiency).
To estimate distribution of $\nu_i$ under existing tax schedule need:

- tax schedule
- tax data on distribution of income
- estimates of elasticity of taxable income at different income levels

Tax cuts will increase labor supply

- This creates a negative fiscal externality (i.e. additional revenue) due to increase in tax revenue if tax rates are positive (as they mostly are)
- This creates a positive fiscal externality (i.e. an additional cost) due to lost tax revenue if tax rates are negative (i.e. EITC)
MVPF of a $1 tax cut at high end of income distribution ~$1.5

- A dollar tax cut to the rich generates $1 in benefits and costs about $0.65 (negative fiscal externality because of increased labor supply and hence increased tax revenue)

Estimates MVPF of $1 tax cut at bottom of income distribution of ~$0.88 (through EITC)

- Generates $1 in benefits but cost if $1.15 (positive fiscal externality because of increased labor supply in response to the increased tax subsidy)
Aside: MVPF of EITC tax cut (Hendren 2016)

- Thought experience: Marginal shift outward of entire EITC schedule
- Recall EITC structure:

![Basic Structure of the Federal EITC](image)

*Credit Amount, Single Filer With Two Dependent Children, 2014 Tax Year*
Student comment: but isn’t the point of the EITC to get low-income people to work more? So why do we count this "against" the program?

Purpose of program is redistribution.

- If expanding EITC causes people to work more, they get a wage subsidy and we redistribute to them, but this has a cost of increased government expenditure that wouldn’t have existed in the absence of the behavioral response
  - That is the fiscal externality that reduces the MVPF below 1
- If working in turn causes other behaviors that have fiscal externalities (e.g. less crime) we should count that too
- But if separately "society" just "values poor people working" - now we have a non-individualistic SWF!
Figure 8: Using Efficient Welfare Weights for Policy Evaluation

The figure illustrates the use of efficient welfare weights for assessing the efficiency of government policy changes. The line presents the value of $1/g(y)$, which represents the amount of welfare that can be delivered to each portion of the income distribution per dollar of government spending. The dots present estimates of the marginal value of public funds (MVPF) for three policy examples: the job training partnership act (JTPA) from Bloom et al. (1997), food stamps from Hoynes and Schanzenbach (2012), and Section 8 housing vouchers from Jacob and Ludwig (2012). The vertical axis presents the estimated MVPF from Table 1 of Hendren (2016); the horizontal axis presents the estimated income quantiles of the beneficiaries of each policy (normalized to 2012 income using the CPI-U). An MVPF that falls above (below) the Income/EITC line correspond to policies that can (not) generate Pareto improvements.
Transferring (through the income tax) $1 from the top of the income distribution can generate about $0.65/1.15 = \$0.57$ of welfare to someone at the bottom of the distribution.

Conversely, transferring $1 from the bottom of the income distribution can generate around $1.15/0.65=\$1.77$ of welfare to those at the top of the income distribution.

Lower MVPF for a tax cut to the poor than to the rich is consistent with an optimal tax system in the presence of a social welfare function that places greater weight on the marginal value of resources for the poor than the rich (e.g. a utilitarian social welfare function).

Mirror image of Okun’s (1975) "leaky bucket"
Using MVPF for absolute welfare evaluation

- Thus far have used MVPF for comparative welfare evaluation across policies
- Alternative question: "should" a policy w a given MVPF for a given group be enacted?
  - Requires specifying a set of individual and societal preferences
- Imagine a policy that takes $1 from group B and spends it on a policy directed at group A. ratio of MVPF of the policy aimed at A relative to the one aimed at B reveals implicit welfare weights at which society would be indifferent to this policy
- One approach is to assume the income tax schedule is set optimally / "reveals" a set of implicit social welfare weights
  - Then MVPF of any policy can be judged relative to a tax change for same income group
- Alternatively can specify a SWF
Example: Suppose ratio of MVPFs for directing a $ to group A and taking a dollar from group B is $0.8

- Suppose group A has consumption that is 50% of that of group B.
- "Should" we do that policy?

An MVPF of $0.8 says that every $ of direct expenditure (mechanical costs) on group A ends up costing $1.25 (i.e. $1/(1+FE) = 0.8$)

- So it costs (in total) $1 to generate $0.8 in benefits
- Assume CRRA utility w/ $\sigma = 3$ (i.e. $u(c) = \frac{c^{1-\sigma}}{1-\sigma}$) so that $u'(c) = \frac{1}{c^3}$
- Marginal utility of consumption of group A is 8 times that of group B

Therefore society would desire a transfer policy from group B to group A with an MVPF of 0.125 or greater

- i.e. would be willing to burn $0.875 cents to transfer $0.125 from B to A.
Thus far have considered a policy that targets income group $i$

- What about a policy that has multiple beneficiaries of different income groups?

Example: welfare analysis of expenditure on public good (e.g. lighthouse)

- Samuelson condition: compare the sum of benefits across people to the cost

\[
MVPF^{public\,good} = \frac{\frac{1}{N} \sum_{i} \eta_i W_i}{1 + FE}
\]

where $W_i$ is individual $i$’s WTP out of own income for a $1$ more spending on public good and $\eta_i$ is individual’s social welfare weight

- Where do social welfare weights come from? Can impose social welfare function. Or use efficient welfare weights as a natural benchmark in searching for Pareto improvements.
Example: welfare analysis of $1 increase in Pigouvian subsidy to correct a positive externality (e.g. vaccine)

\[ MVPF_{Pigou} = \frac{1 + \sum_{i} \eta_i E_i}{1 + FE} \]

where \( E_i \) denotes the monetized welfare effects on an external party, \( \eta_i \) denotes his corresponding social welfare weight relative to the infra-marginal recipients (I), and the summation is taken over all externally affected individuals.

Same would apply to a policy not designed to correct an externality but that has effects on external parties (i.e. non recipients).
Clarification: Baily-Chetty measures "costs" as impact of UI benefits on UE duration"

- But of course can/should be expanded to incorporate budgetary impacts on additional margins (e.g., if UI changes wages, this affects government budget via income tax revenue)

MVFP can (loosely) be thought of as the ratio of the LHS/RHS of Baily

- Non-trivial framing difference: do we care about whether MB > MC or how MB/MC compares to other programs

May be happy w MB/MC < 1 if value transfers to poor (e.g., EITC, Medicaid)
MVPF Summary

- MVPF is ratio of benefits (WTP) to costs
- Costs require estimates of causal effects of policy on government budget
  - Any behavioral response that potentially affects public revenue or expenditure needs to be estimated
  - Any behavioral response with no public sector budgetary implications does not
  - Provides guidance for what causal effects are relevant for welfare analysis
- Cash benefits require no further analysis
  - Valued $ for $ by infra-marginal recipients and no net utility impact for marginal recipients via envelope theorem
- In kind benefits: envelope theorem still applies for marginal recipients but need to estimate value for infra-marginal recipients
- Multiple beneficiaries: need to assume a set of (relative) social welfare weights for non-recipients
MVPF: Two key assumptions

- Marginal changes and individuals making (privately) optimal choices
  - These allow us to exploit the power of the envelope theorem

- What if we don’t want to invoke the envelope theorem?
  - Non-optimizing agents or non-marginal changes

- Non-marginal changes:
  - Need additional assumptions or estimates to calculate benefits for marginal recipients
  - see Kleven (2018) "Sufficient Statistics Revisited"

- Non optimizing agents
  - Now may have first order welfare effects for marginal recipients.
Example I: Welfare analysis of a job training program

- Public program that provides unemployed individuals with motivational videos about exciting jobs they could find, to try to encourage them to find jobs.

- Average program impacts, per person enrolled:
  - Implementation costs: $1,000
  - Pre-tax earnings increase: $2,400
  - Increase tax payments: $200
  - Decrease food stamp and Medicaid spending: $200
Recall MVPF definition: recipient WTP out of own income relative to the costs of the program

Questions:

- What is the program cost (denominator of MVPF)?
- Is the earnings impact a benefit to individuals? Describe one scenario in which it is and one in which it isn’t. What is MVPF in each case?
  - Key issue: does it increase their options available (in which case could be valued as high as $2,400) or does it increase their effort at finding job (at which case might have been just indifferent so valued at $0)?
- How (qualitatively) would you adjust MVPF calculation if the program impact on jobs crowds out someone else getting that job one for one.
Example II: Welfare analysis of a job assistance RCT

- Researchers designed an RCT to help unemployed individuals find work by helping them apply for a job / reducing application costs.
- They estimate that the intervention costs $1,000 per person and reduces application costs by $10. If apply, get a job that pays $20,000 for the year.
- They randomly assign 10,000 people to the intervention and 10,000 people to control.
- They estimate that:
  - 10% are always takers (would have found a job with or without the treatment)
  - 80% are never takers (do not find a job with or without the treatment)
  - 10% are compliers (find a job w treatment, would not find without)
  - (Question: how do they identify these shares?)
- Impact of the intervention on compliers (i.e. the LATE): $2,400 increase in pre-tax earnings, and $200 increase in tax payments and $200 decrease in SNAP and Medicaid spending
  - (Question: how did they estimate this?)
Example II: Welfare analysis of a job assistance RCT

- What is the MVPF of the program per person who received the program?

- What are the costs per person?
  - Mechanical costs: $1,000
  - Fiscal externality: -$400 *for the compliers*
  - Total cost: $1,000 - $0.1($400) = $960

- What are the benefits per person?:
  - Never takers: $0
  - Always takers: $10 reduction in application costs
  - Compliers: $0
  - Total benefits: $1 (= $10 x 0.1)

- Note: a job assistance program has no benefits from finding people extra people jobs?!
  - How could we "break" that?
Example III: Welfare analysis of job loss due to Medicaid expansion

- Garthwaite, Gross and Notowidigdo (QJE 2014): Contraction of Medicaid in TN causes people to exit employment
  - Natural experiment in TN
  - eliminated an expansion program (TennCare) that (mostly) covered adults over 19 if childless and "uninsurable", regardless of income
  - Adults kicked off Medicaid see large increases in employment (and in their employer-provided private insurance coverage)

- Potential implication for ACA: Medicaid expansion could case decreases in employment

- Why might there be employment effects from Medicaid expansion?
  - Decrease employment:
    - Were working to access (cheaper) employer provided health insurance
    - Income effect
  - Increase employment:
    - Were reducing labor force participation to meet income threshold
    - Were missing work due to bad health / disruptive health emergencies
Welfare analysis of job loss due to Medicaid expansion

Let's define the question: How does the welfare analysis of the Medicaid expansion differ with and without the estimated job loss effects?

So we are NOT asking about the value of Medicaid to those who lost coverage! just the welfare impact of job loss from Medicaid expansion

- We will study the value of Medicaid later in course!

Hendren’s answer: Welfare cost is lost government revenue (i.e. lost tax revenue on earnings)

- By envelope theorem, individuals quitting job are indifferent on margin - no welfare consequences
- Only need to think about external effects on government budget
Example IV: How does "crowd-out" literature fit in?

- Public provision can crowd out private provision
  - Education (Peltzman 1973)
  - Health insurance (Cutler and Gruber 1996; Brown and Finkelstein 2008)
- Potential solution: "top up" policies
- Concrete policy example: vouchers for private school
Peltzman (1973): Public Education Crowds out Private Education

The graph illustrates the concept of Public Education Crowds out Private Education, with a focus on the trade-offs between education spending and other goods spending. The diagram shows a budget constraint and indifference curves, with points A, B, C, D, X, Y, and Z denoting different levels of education and other goods spending. The area $E_F$ represents the cost of crowding out private education.

- $E_F$: The area representing the cost of crowding out private education.
- $A$: Initial point indicating initial levels of education and other goods spending.
- $C$: Point indicating an increase in education spending due to the crowding out effect.
- $X$: Point indicating a decrease in other goods spending due to the crowding out effect.
- $D$: Point indicating a further increase in education spending.
- $Y$: Point indicating a decrease in other goods spending.
- $Z$: Point indicating a further decrease in other goods spending.
- $B$: Final point indicating a significant increase in both education and other goods spending due to the crowding out effect.
Vouchers offset public school crowd out

Other goods spending

Education spending

$E_F$

$E_F$

$E_F$

$G_2$

$G_1$

$G_5$

$G_6$

$G_3$

$G_4$

$E_1$

$E_F$

$E_2$

$E_4$

$E_3$

$E_5$

$B$

$E$

$A$

$X_1$

$Y_1$

$Y_2$

$Z_1$

$Z_2$
Economic analysis of vouchers

- Allows consumers to face (non distorted) price of their choice (vs inframarginal tax)
- One potential concern: "inefficient and inequitable use of public resources" (Gruber textbook)
  - Public spending on education increases (See family Z who was previously paying the entire cost of private school; now government pays $E_F$)
  - More general concern with increased government spending for inframarginal participants (see e.g. UBI)

- How does this affect the MVP?
  - No inherent problem with funding inframarginal activities
  - Relevant questions include:
    - Would these inframarginals prefer a different policy (e.g. a tax cut)
    - who (distributionally) are the inframarginals. Then we can compare MVPF of this (distributional) policy to MVPF of another policy with another distributive impact (e.g. expanding spending on public schools)
Aside: 471 provides the tools to think about UBI
  - UBI is about a level shift of the intercept of the tax schedule.
    - What is the optimal intercept? This is an optimal tax problem!

Lots of RCTs in this space
  - US, Finland, Canada...

See also Hoynes and Rothstein (2019) "Universal Basic Income in US and Advanced Countries"

One concern is "increased government spending"...
Other applications

- EITC (see Hendren papers)
- Provision of in-kind goods (Medicaid expansion) - will discuss
- Health Insurance Subsidies for low-income individuals - will discuss
- Policies to increase take-up of in kind benefits - will discuss
- Hendren (in progress) is constructing MVPFs for a huge range of social programs based on existing empirical estimates!
Figure 8: Using Efficient Welfare Weights for Policy Evaluation

Efficient Policies

1/g(y)

Income (Quantile Scale)

MVPF

Inefficient Policies

JTPA

Section 8

Food Stamps

Notes: This figure illustrates the use of the efficient welfare weights for assessing the efficiency of government policy changes. The line presents the value of \( 1/g(y) \), which represents the amount of welfare that can be delivered to each portion of the income distribution per dollar of government spending. The dots present estimates of the marginal value of public funds (MVPF) for three policy examples: the job training partnership act (JTPA) from Bloom et al. (1997), food stamps from Hoynes and Schanzenbach (2012), and Section 8 housing vouchers from Jacob and Ludwig (2012). The vertical axis presents the estimated MVPF from Table 1 of Hendren (2016); the horizontal axis presents the estimated income quantiles of the beneficiaries of each policy (normalized to 2012 income using the CPI-U). An MVPF that falls above (below) the Income/EITC line correspond to policies that can (not) generate Pareto improvements.
Road Map: Redistribution Frameworks

- Basic welfare economics (Kaplow) [done]
- Marginal Value of Public Funds (Hendren) [done]
- Self Targeting (Nichols and Zeckhauser; Currie and Gahvari) [up next]
Self-targeting

- Idea: Imperfect information constrains government from achieving "first best" amount of redistribution:
  - Optimal non-linear tax is second-best (binding IC constraint on high ability)
- Self-targeting as a way to improve the efficiency of the tax system
- Basic idea: design the system in a way that induces individuals to reveal some hidden information (self-target)
- Applications include:
  - in-kind vs cash transfers
  - "ordeals" - pure deadweight costs (e.g. long lines; cumbersome paperwork etc)
Recap: Optimal income tax

- Recall basic Mirlees (1971) model:
  - High and low ability types have different ability (marginal product / wage)
  - Goal of income tax is to redistribute from high to low ability
  - Ability is not observed
  - Income (= wage x hours) is observed

- Binding IC constraint on high ability type prevents first best redistribution
  - i.e. equalizing consumption across types (w utilitarian swf) not incentive compatible

- In-kind transfers can weaken IC constraint and allow more redistribution if hurts the would-be mimicker (high ability) less than the mimicked (low ability)
  - i.e. if high and low ability want to consume different levels of the in-kind good
In-kind transfers can improve the efficiency of the income tax system via impacts on labor supply.
Relates to literature on benefits of commodity taxation in presence of optimal income tax (Currie and Gahvari 2008 JEL is nice overview).
Relationship to optimal income tax theory (471)

- Atkinson-Stiglitz (1976): no role for in-kind transfers
  - assumes: preferences are weakly separable between labor supply and consumption goods, and identical for all consumer types (only heterogeneity is in skills)
  - Pareto efficient allocations (constrained by self selection) can be implemented through a non-linear income tax
  - Commodity taxes are not needed (and therefore in-kind transfers as well) in presence of optimal income tax
  - Key intuition: consumption taxes are redundant because MRS between any two goods is same for the mimicker and the mimicked

- Saez (2002): rationale for in-kind transfers
  - Allow for heterogeneity in preferences across types
  - Then differential commodity taxes can be useful for redistribution if consumption patterns provide additional information about ability (correlated preference heterogeneity)
Nichols and Zeckhauser 1982

- Basic idea: Tradeoff between productive efficiency and targeting efficiency
  - Design of optimal second best transfer policy may involve sacrifice of productive efficiency

- Want to redistribute based on an unobserved characteristic (e.g. ability). Key insight:
  - If demand for specific goods is correlated with unobserved characteristic, can transfer more efficiently by sacrificing productive efficiency
    - Exploit single crossing feature: people of different ability have different marginal utility (disutility) from specific goods

- Example: in kind vs cash transfers
  - General economic view: cash dominates (allow people to optimize unconstrained).
  - But N-Z argue that in kind vs cash can improve self-targeting if increases cost of participation more for high ability than intended recipients (low ability)
In-Kind Transfers to Deter Imposters

- Two types: Intended recipients (B) and potential imposters (A). Type not observed.
- There is a pure income tax-transfer scheme in place in which if pre-tax income is restricted to a certain level, receive a cash transfer. Assume B receives transfer, A does not.
- Assume that optimal tax transfer scheme has not fully equalized mu of income (B’s is still higher so would like to do more transfers but if so would violate IC constraint). Binding IC constraint: A indiff btwn pretending to be B and not...
- Given his transfer income, B chooses to purchase optimal amt X*(B) of good X.

FIGURE 2. IN-KIND TRANSFERS TO DETER IMPOSTORS
- Were A to shirk and receive same income as B, he would buy only X*(A) worth of X.
- Figure shows A’s utility as a function of X consumed if he masquerades as B and gets the transfer intended for B.
In-Kind Transfers to Deter Imposters

- Key point: when shirking and claiming to be B type, A’s optimal consumption of X is less than B’s

- Now imagine we convert part of the cash transfer to in-kind provision of X

- Setting amt provided below $X^*(A)$ has no effect (relative to cash)

- As we raise the amount provided above $X^*(A)$, A suffers increasing losses if he masquerades as B, and B suffers no loss so long as $X < X^*(B)$

- So at a minimum would want to set amt of X provided at $X^*(B)$. Providing $X^*(B)$ in lieu of cash: B (intended recipient) is no worse off; A is no worse off if he doesn’t masquerade. Moreover...

If A does masquerade he has lower utility than with cash redistribution (see picture) thus creating opportunity to do more redistribution (before A was indifferent b'twn masquerading and not, now strictly prefers not to)
• Have just argued that can increase redistribution (which wanted to do given binding IC constraint) by providing $X^*(B)$ in kind in lieu of cash

• Key point: In general, will be optimal to transfer an amt $X$ larger than $X^*(B)$.

• Intuition: Envelope thm: marginal increase in $X$ above $X^*(B)$ has only second order welfare loss to $B$ but first order welfare loss to $A$ if masquerades.

• Optimal in kind transfer scheme forces $B$ to consume “too much” $X$

• Sacrificing productive efficiency to increase targeting efficiency!
Nichols and Zeckhauser analysis also suggests may be optimal to have “ordeals” in transfer programs: i.e. pure deadweight cost e.g. 
- Tedious administrative procedures; stigma; etc

May enhance target efficiency if benefits from transfers vary across potential recipients
- Suppose intended get 100 utils from transfer
- Suppose imposters get 10 utils
- Then ordeal that imposes an 11 util loss in order to qualify for the transfer would be an effective screening device

Example: make people on Medicaid (which pays for long term care) get care in nursing home rather than in home
- People tend to prefer home care
- Nh care is more expensive
- Nevertheless, may be a good screen for those who would buy private insurance in absence of public program...

Will return to and consider some opposing theories and empirical evidence when we get to take-up
Ordeals may have exactly the opposite targeting effect as that conjectured by neo-classical theory (e.g. Nichols and Zeckhauser 1982)

- screen out precisely those applicants the social planner would most likely enroll
- e.g. poverty imposed "bandwidth" tax on poor individuals, making them more likely to undertake high net-value activities like enrolling in transfer programs for which they are eligible ("Mullainathan and Shafir, 2013)

This raises two questions:

- Empirically: who is screened out by ordeals?
- Conceptually: how do the self-targeting properties of the ordeals relate to its welfare implications?
Road Map Section VI (Redistribution)

- **Frameworks:** [Done]
  - Basic welfare economics (Kaplow)
  - Marginal Value of Public Funds (Hendren)
  - Self-targeting (Nichols and Zeckhauser; Currie and Gahvari)

- **Topics:** [Up next]
  - Cash vs. In Kind Transfers: Why would we ever redistribute in-kind?
  - Self Targeting: Is low takeup "a problem"?

- **Empirical application:** Subsidizing health insurance for low-income adults
  - Empirical challenge: measuring WTP for an in kind good not traded in well functioning markets
  - Conceptual challenge: how to use estimates of WTP - what benchmarks?