14.472 Public Finance II

Redistribution: Frameworks

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Road Map - Redistribution (Unit V)

- Frameworks (theory):
  - Basic welfare economics (Kaplow)
  - Marginal Value of Public Funds (Hendren)
- Instruments (theory):
  - Tagging (Akerlof)
  - Self-targeting (Nichols and Zeckhauser; Currie and Gahvari)
- Applications (with empirics):
  - Cash vs. In Kind Transfers: Why would we ever redistribute in-kind?
  - Low take-up of benefits: Is it "a problem"
  - Places vs People: Why would we ever redistribute based on place?

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 *only matter* through their impact on individuals' utiltiies, and *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

$$SW(x) = W(u_1(x), ..., u_n(x))$$

- 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)

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

  - where $e \geq 0$ indicates degree of aversion to inequality in the distribution of utility levels

Sources of Concavity

- Two source of convavity

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

  - $u_i(x)$: utility function with its own concavity
  - e: inequality aversion parameter

Two sources of Concavity

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

- $u_i(x)$ - 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 consumptoin
    - 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

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

- 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 elicite 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

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

- 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 utilitatarian SWF with a lot of concavity in the individual utility function might get pretty close to Rawlsian SWF w less concavity in individual utility function

Welfarism and the Pareto Principle

- 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?"
- Kaplow and Shavell (2001 JPE): Any non-individualistic welfare function violates the Pareto principle
  - 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 (A) to another (B) that is identical except in two respects: A is
    - 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)

Welfarism and the Pareto Principle

- 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 welath.
  - "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 cemantics?
  - 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 differnet 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
  - sancitity of promises, norms of fair division (to reduce conflict), principles of retribution (to deter aggression)

Examples (con't)

- Criteria for good tax system: equity, efficiency, simplicity, administratability
  - 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 and Finkelstein (JEP 2020)
  - Hendren and Sprung-Keyser (QJE 2020)

Welfare Analysis Meets Causal Inference

- "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 elasticiites, 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 poor than rich (mirror image of Okun's "leaky bucket").

MVPF

- 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:

$$MVPF = \frac{\text{Beneficiaries' Willingness to Pay}}{\text{Net Cost to Government}}$$

  - ratio of the beneficiaries' willingness to pay (WTP) for the increase in expenditure *out of their own income* to the net cost of the government of the increase in expenditure per beneficiary

Initial simplifying assumptions

- Initial simplifying assumptions
  - Cash (not in kind)
  - Marginal (not large) policy change
  - Assume revealed preference / individuals are privately operating
  - No external parties other than the government
- Can / will relax all these
  - Although they present real additional empirical challenges

Example: MVPF for a $1 increase in cash benefit

- Recall

$$MVPF = \frac{\text{Beneficiaries' Willingness to Pay}}{\text{Net Cost to Government}}$$

- 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 qualify for TANF)
- Useful to separately consider benefits and costs

Example: MVPF for a $1 increase in cash transfer

$$MVPF = \frac{\text{Beneficiaries' Willingness to Pay}}{\text{Net Cost to Government}}$$

- 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 = $**I** ($1 times number of inframarginals)
- Note: So far we have not needed to estimate anything to calculate benefits (including any causal effects)
  - WTP for the transfer is just the mechanical cost of the transfer
  - Note: have only focused on inframarginals. WTP = height of demand curve; don't need slope (wtp of marginals)
- Now let's turn to costs...

MVPF for a $1 increase in cash benefit (con't)

$$MVPF = \frac{"Benefit" = \$I}{"Net" Cost}$$

- What is the cost of $1 increase? Two types of costs
  - Mechanical cost: Increased govt expenditures holding behavior constant: $**I**
  - 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 their behavior on the government budget*

MVPF for a $1 increase in cash benefit (con't)

$$MVPF = \frac{\text{Beneficiaries' Willingness to Pay}}{\text{Net Cost to Government}}$$

- 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 expenidture per infra-marginal beneficiary)

$$MVPF^{\$} = \frac{1}{1 + FE}$$

  - 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 responss 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) bc of income effects

Implications for empirical work

- Need causal response to policy only for denominator: i.e. in so far as these behavioral responses affect the government's budget (fiscal externality)
- Benefits (numerator) are the receipients' WTP for the transfer
  - In case of a marginal cash transfer and optimizing agents, this is simply the size of the cash transfer times the number of inframarginal agents
  - More general cases will pose challenges for estimating WTP
  - but these are empirical challenges, not conceptual ones.
  - The way forward empirically does not obviously involve estimating the behavioral impacts of the policy

Estimating WTP (more generally)

- What if the cash transfer is large (not $1)
  - Relied on marginal cash transfer to assume wtp was zero for marginal recipient
  - With large policy change, now need an estimate of the marginal recipients' demand curve for the increase in public expenditures
  - WTP for marginals is area under demand curve
- What if individuals aren't privately optimizing?
  - This was the second key to being able to ignore welfare consequences for marginal agents
  - If demand doesn't reveal value for marginal agents, must find a way to estimate it (elicit valuations experimentally? calibrate a utility model etc)
- What if the policy involves in-kind transfers?
  - Now we can't assume the inframarginals value it at cost of transfer
  - So now need to estimate wtp for inframarginals
  - Challenging if good is not traded in market (e.g. spending on public education)

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 three cases:
  - Policy with negative net costs
  - Two policies that have same distributional incidence
  - Policies with different distributional incidence

MVPF if policies have negative net costs

- Net cost to government (denominator of MVPF) is negative
  - policy "pays for itself"
- Classic example: if cutting taxes increases revenue, because taxable income raises by more than tax cut (e.g. increase labor supply, less tax evasion)
  - wrong side of the Laffer curve
- Hendren and Sprung Keyser (2020) define a policy with negative net costs as having an "infinite WTP"
  - As long as we think willingess to pay is (weakly) positive, policy is no brainer
  - Can reduce government spending and make people better off
  - Pareto improvement
- But this is way too high a bar / standard to strive for

Comparing policies that target same population

- Consider two policies that have same distributional incidence - both transfer to group i
  - e.g. expand cash welfare (TANF) or expand Earned Income Tax Credit (EITC)
- Policy with higher MVPF is preferred
  - it is a lower cost way of transferring resources to group i
- A key attraction of MVPF is can do comparative welfare analysis across policies without taking a stand on individual utility function or social welfare function
  - Economists' comparative advantage is not defining societal objectives but rather, given a societal objective, determining how to achieve it at lowest resource cost
  - classic example: minimum wage vs EITC

Comparing policies that target different populations

- This requires us to take a stand on the social welfare function
  - Let η_i define the social welfare weight for group i - i.e. the marginal social value of an additional dollar to group i
  - Gives us a way of assessing e.g a policy that transfers resources to group i from group j
- We would like to cut spending on policy j and increase spending on policy i iff

$$\eta_i MVPF_i > \eta_j MVPF_j$$

Where do social welfare weights come from?

- Inverse optimum approach:
  - existing policies reveal implicit social welfare weights
  - 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
- Assumption / Introspection / philosophy
- Hendren (2017): use "efficient welfare weights" to search for Pareto improvements

Assuming 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.
  - Assume a utilitarian SWF
  - Assume individual utility is CRRA w/ $\sigma = 3$ (i.e. $u(c) = \frac{c^{1-\sigma}}{1-\sigma}$) so that $u'(c) = \frac{1}{c^3}$)
- "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
  - Marginal utilty 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.
  - Okun's leaky bucket

Hendren (2017): Efficient welfare weights

- Efficient welfare weight ν_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
  - ν_i is cost of transferring \$1 to indivdiuals 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)

- ν_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 multuplying by ratio of efficient welfare weights.

Efficient welfare weights (con't)

- 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 ν_i
  - If policy's MVPF exceeds ν_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).

Using MVPF for absolute welfare evaluation

- Thus far have used MVPF for comparative welfare evaluation across policies
- Attraction of MVPF: severs the spending analysis from the revenue-raising analysis
- MVPF > 1 means that a dollar of spending on the policy generates morde than a dollar of benefits
  - Should we do it?
- The policy presumably has to be paid for (through higher taxes, deficit financing, or cuts in other spending).
- We can then think about the MVPF both of the spending policy and of the MVPF of various ways to finance it - including reduced spending on other policies, increases in specific taxes, or deficit financing, and use the approach above of "comparing the MVPF of two policies."

Additional applications

- Welfare analysis of \$1 of in-kind transfer (e.g. health insurance; food stamps)
- Welfare analysis with multiple affected parties:
  - public goods
  - externalities

MVPF for in-kind transfers

- 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 (will discuss a bit more below)

MVPF with multiple beneficiaries

- 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 condtiion: compare the sum of benefits across people to the cost

$$MVPF^{publicgood} = \frac{\frac{1}{N}\sum_i \eta_i W_i}{1 + FE}$$

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

MVPF with multiple beneficiaries (con't)

- Example: welfare analysis of \$1 increase in Pigouvian subsidy to correct a positive externality (e.g. vaccine)

$$MVPF^{Pigou} = \frac{1 + \frac{\sum_i \eta_i E_i}{I}}{1 + FE}$$

where E_i denotes the monetized welfare effects on an external party, η_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)

Empirical example: MVPF of changes in marginal tax rates (HSK 2020)

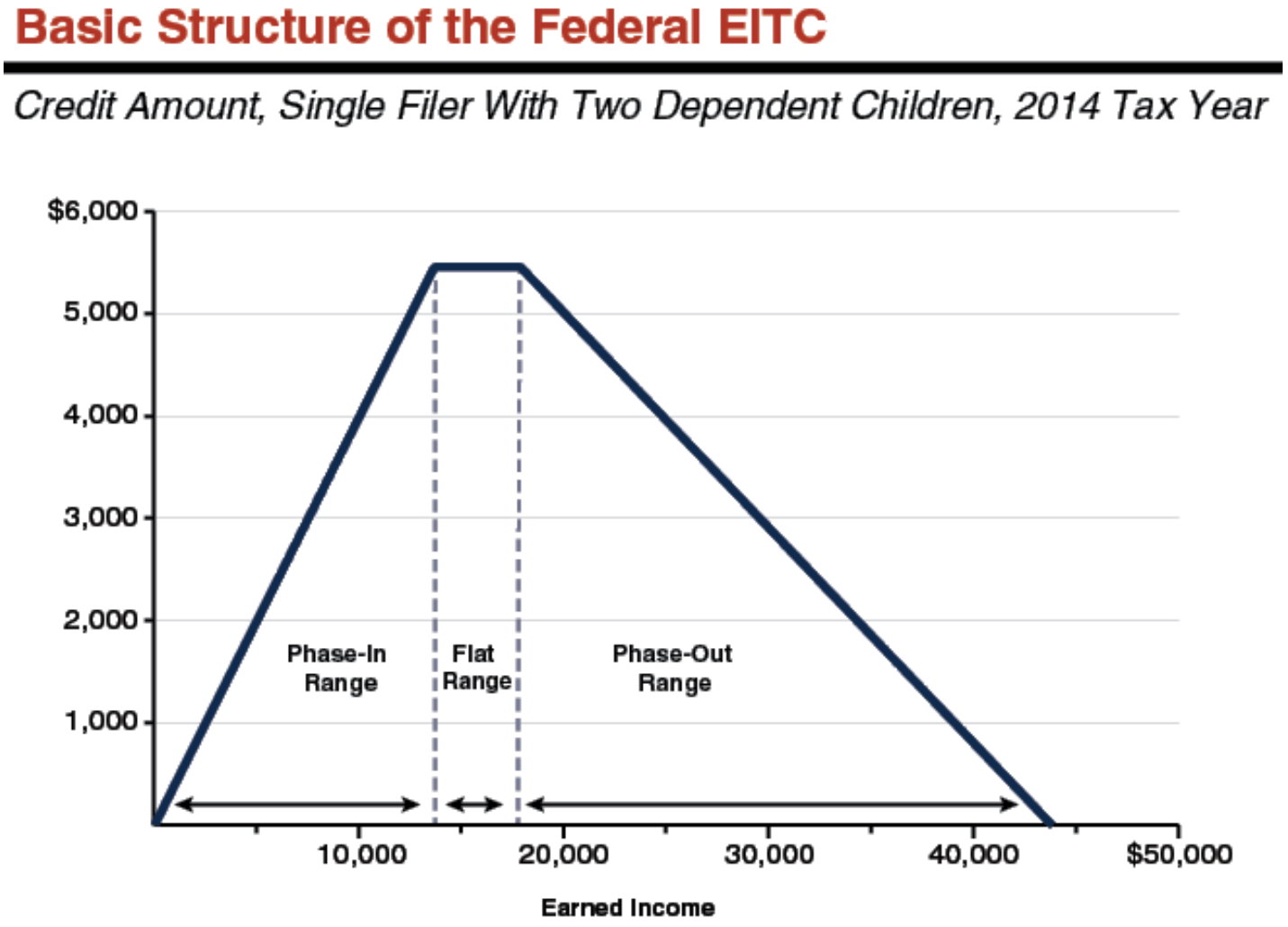
- Consider tax cut at top or bottom of income distribution
- Benefits (wtp by recipients) of a $1 tax cut: $1
- Net cost to government of $1 tax cut
  - Mechanical cost: $1
  - Fiscal externality (FE) from behavioral responses to tax cut
- Fiscal externality
  - through e.g. changes in labor supply and tax avoidance
  - Could be positive or negative

Cut in top marginal tax rates

- MVPF of top marginal tax cuts (or increases) ~$1.5
  - i.e. FE ~ -0.3
  - so denominator (costs) ~0.7 (less than mechanical cost)
  - A dollar tax cut to the rich generates $1 in benefits and costs about $0.7 (negative fiscal externality because of increased labor supply and hence increased tax revenue)
- MVPF of 1981 tax cut (reduced marginal income tax rate from 70% to 50%) may be infinite
  - FE may have been sufficiently negative (due to substantial labor supply response) that net cost is negative
  - On wrong side of Laffer Curve

Cut in bottom marginal tax rate / EITC expansion

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



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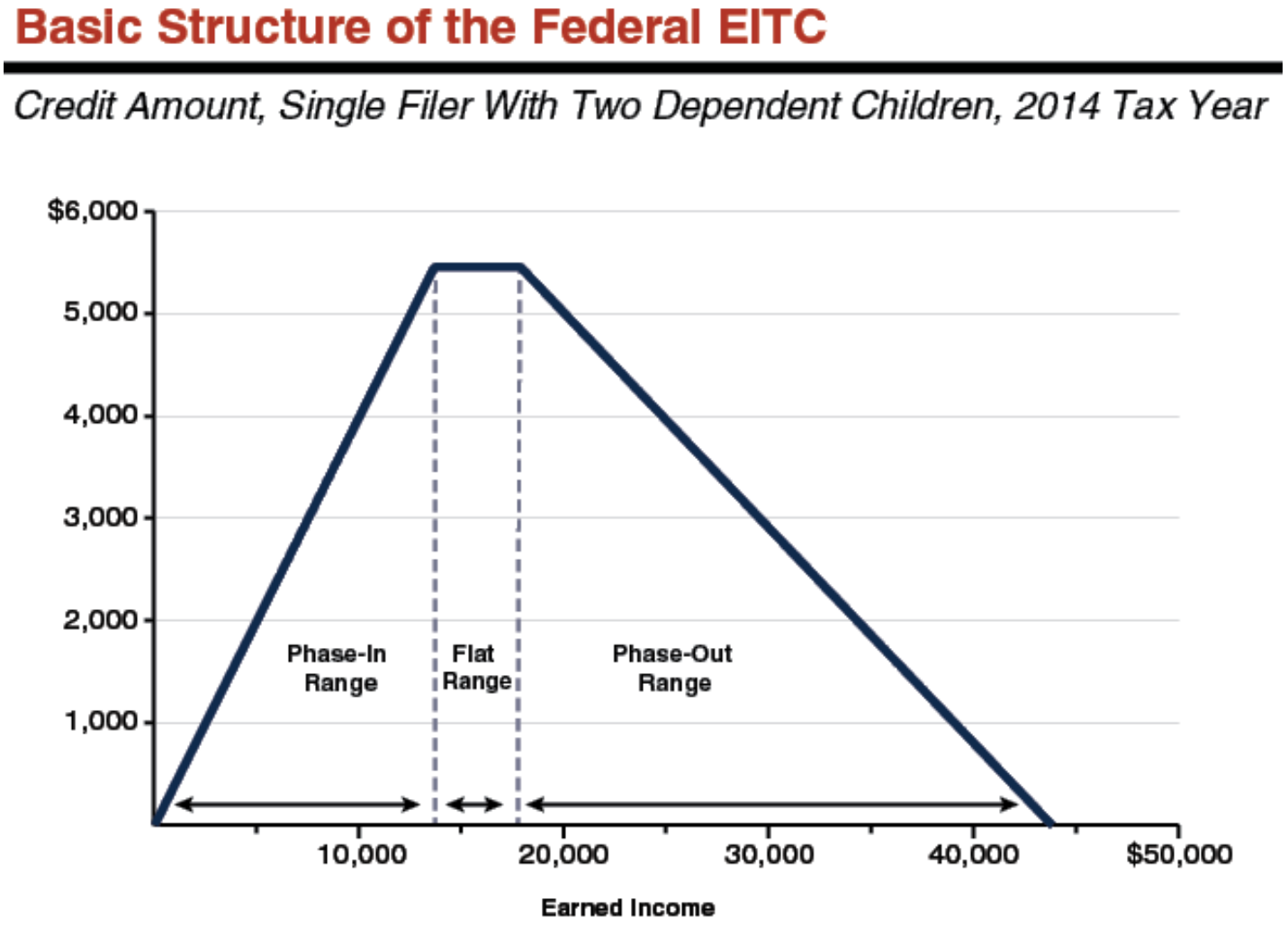


MVPF of tax cut through EITC expansion

- Estimate MVPF of EITC expansion of ~0.9 (Hendren 2016)
  - i.e. fiscal externality is ~0.1
  - so denominator (costs) is ~1.1 (greater than mechanical costs)
- Note: Tax cuts increase labor supply
  - This creates a negative fiscal externaity (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)
- NB: Hendren and Sprung-Keyser (2020) re-estimate MVPF for EITC tax cut to be above 1 (bc of decreased SNAP and Medicaid expenditures)

MVPF of tax cut through EITC expansion

- 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!

Comparison of MVPF of tax cut at top vs bottom

- Transferring (through the income tax) \$1 from the top of the income distribution to someone at the bottom has an MVPF of about 0.6 (=0.9/1.5)
  - If take \$1 from top through tax increase can generate \$0.6 in benefits for bottom through tax cut can generate about
- Conversely, transferring \$1 from the bottom of the income distribution can generate around 1.7 (=1.5/0.9) of benefits 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"

More empirical examples

- See Hendren and Sprung Keyser (2020)
- "Library" of 133 examples in four domains: social insurance, education, tax and cash transfer, in-kind transfers
- Find some interesting patterns
  - e.g MVPF of policies that spend on kids tend to be higher than policies that spend on adults

Four hypothetical / conceptual examples

- Job training
- Reducing job search costs
- Job loss due to Medicaid expansion
- Crowd out of private provision by public provision (e.g. health insurance, education)

Example I: Welfare analysis of a job training program

- Public program that provides unemployed individuals with motivational videos about exciting jobs they coudl 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

Example I: Welfare analysis of a job training program

- 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 search 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 search 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 externalty: -\$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: <\$10 (let's assume 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 enter 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

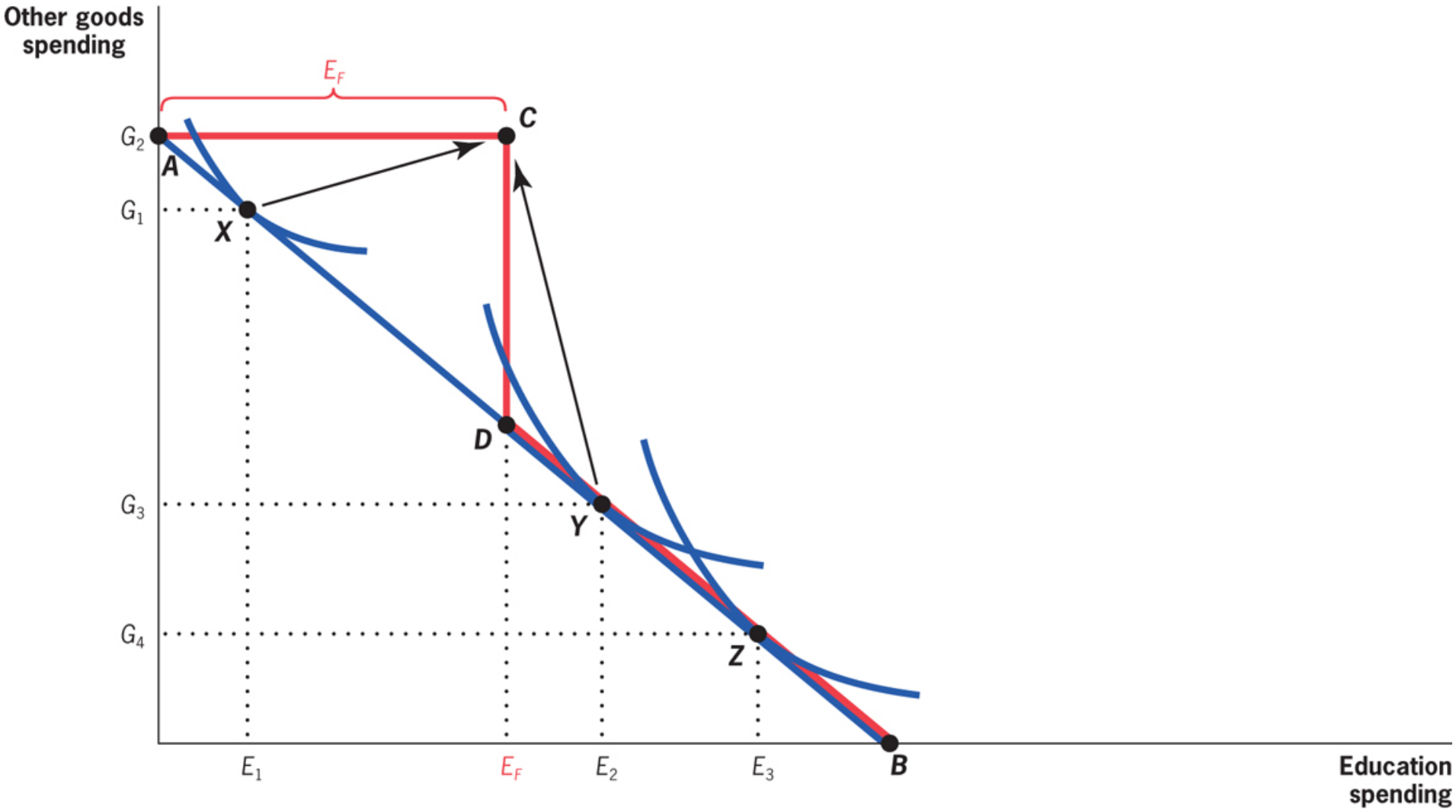
Welfare analysis of job loss due to Medicaid expansion

- 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

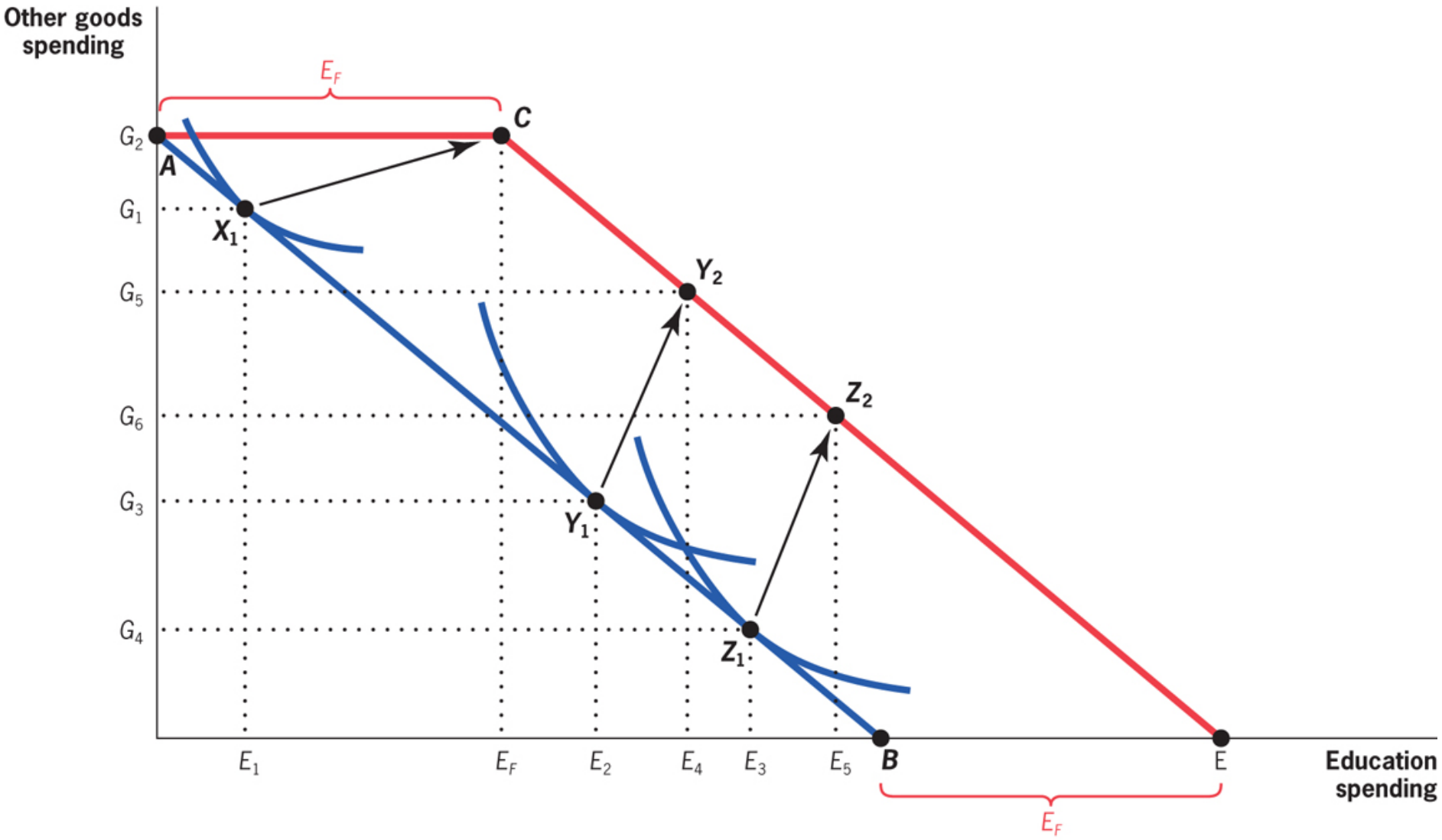
Example IV: How does "crowd-out" literature fit in?

- Public provision can crowd out private provision
  - Education (Peltzman 1973)
  - Health insuance (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



Vouchers offset public school crowd out



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 do "large numbers of inframarginal recipients" affect the MVP?

MVPF framework and large numbers of inframarginal recipients

- More general concern with increased government spending for inframarginal participants (see e.g. UBI)
- How do "large numbers of inframarginal recipients" affect the MVP?
  - No inherent problem with funding inframarginal activities
- Relevant questions include:
  - All else equal, a large number of transfers to inframarginals push MVPF towards 1 (benefits and mechanical costs are same)
  - then a key question is the fiscal externalities which can lower MVPF
  - Also 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)

Related example: Universal Basic Income (UBI)

- 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"...

MVPF construction: Two key assumptions thus far

- 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 marginal changes
  - Non-optimizing agents

Non-marginal changes

- Non-marginal changes:
  - see Kleven (2018) "Sufficient Statistics Revisited"
  - Approximation of envelope theorem fails
- MVPF is still useful framework but now benefits to marginal recipients cannot be ignored
  - must be estimatd and incorporated
- Need area under demand curve for recipients
  - Now need slope of demand curve, because need to think about benefits to non-marginal recipients
  - must integrate under the curve

Non-optimizing agents

- Behavioral welfare economics
- Now need value curve, not demand curve
- See previous discussion of challenges of estimating value curve

In-kind goods

- Now need WTP for inframarginals
  - Empirically challenging when good is not traded (can't estimate demand directly)
- Possible approaches include:
  - Find a setting where it is traded and estimate demand (Landais and Spinnewijn 2018 Swedish ui)
  - Make a setting where it is traded and estimate demand (Fischer et al. 2018 RCT)
  - Calibrated life cycle models (Brown and Finkelstein 2018)
  - Behavioral responses to policies (Baily-Chetty literature)
  - Hedonics / amenities (Rosen Roback)
  - Estimate causal effects of policies and monetize them (e.g. Finkelstein et al. 2019)

MVPF: relation to pf theory

- Baily Chetty
- Costly redistribution / Okun's bucket
- In-kind vs. cash (Atkinson Stiligtz theorem)

Relationship between Baily Chetty and MVPF

- Clarification: Baily-Chetty measures "costs" as impact of ui benefits on ue duration"
  - But of course can / should be expanded to incorporates 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)

Costly redistribution

- Redistribution burns resourcs
  - Okun's bucket
  - Mirlees (1971)
- With a utilitarian social welfare function, optimally designed tax system should have MVPF of tax change increasing with income

In kind vs cash transfers

- Basic theory (will discuss in more detail in soon)
  - Atkinson-Stiglitz theorem: if utility is weakly separable in consumption and leisure, prefer cash redistribution vs in-kind
  - Byt without weak separability, in-kind transfers can potentially improve efficiency of income tax system via impacts on labor supply
- Atkinson-Stiglitz implies MVPF of in-kind transfer will always be less than cash transfer to same group
  - testable empirically

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 expenidture 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

Road Map - Redistribution (Unit V)

- Frameworks (theory): [done]
  - Basic welfare economics (Kaplow)
  - Marginal Value of Public Funds (Hendren)
- Instruments (theory): **[up next]**
  - Tagging (Akerlof)
  - Self-targeting (Nichols and Zeckhauser; Currie and Gahvari)
- Applications (with empirics):
  - Cash vs. In Kind Transfers: Why would we ever redistribute in-kind?
  - Low take-up of benefits: Is it "a problem"
  - Places vs People: Why would we ever redistribute based on place?