Lecture 3: Economics of the Welfare State

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Economists and the Welfare State

- **Lack of interest in the welfare state**
  - 1960s few interest from economists, mostly the preserve of social policy expertise (Atkinson, 1999)
  - Public economics or public finance mostly about taxation
- **Stressing market failures**
  - 1970s theoretical advances showing large potentials for market failures (Akerloff, 1970 ; Rothschild and Stiglitz, 1976)
  - Arguments in favour of government interventions for efficiency reasons
- **Stressing the efficiency cost of the welfare state**
  - Disincentives on labour supply and savings of pensions and unemployment insurance (Feldstein, 1974, 1976)
  - Views that the cost of the welfare state is harming growth (Lindbeck et al. 1994 ; Dreze and Malinvaud, 1994)

Basic economics of the Welfare State

- **The efficiency objective**
  - With uncertainty, imperfect information, imperfect markets, role of the welfare state to improve efficiency (Barr, JEL 1992)

  $\Rightarrow$ Welfare State as a Pareto efficient policy instrument

- **The equity objective**
  - Social justice objective to reduce poverty and inequality
  - Potential efficiency cost of taxation to fund welfare state policies

  $\Rightarrow$ Trade-off between equity and efficiency objectives

Lecture outline

I. **Efficiency vs equity objectives**
   1. Fundamental theorems of welfare economics
   2. Roles of Government
   3. Equity-efficiency trade-offs

II. **Questions for policy evaluation**
   1. How should the government intervene ?
   2. What are the effects of alternative policies ?
   3. Why do governments act the way they do ?

III. **Empirics of welfare analysis**
   1. Marginal excess burden (MEB)
   2. Cost benefit analysis (CBA)
   3. Marginal Value of Public Funds (MVPF)

I. Efficiency vs equity objectives of the Welfare State

1. **Fundamental theorems of welfare economics**
   - (i) Failure of first welfare theorem
   - (ii) Fallacy of second welfare theorem

   References : Arrow (1951) ; Debreu (1959)

2. **Two basic criteria**
   1. *Efficiency* : how well resources are allocated (size of the pie)
   2. *Equity* : how resources are distributed among individuals

Failure of the First Welfare Theorem

- **First Theorem :** any competitive equilibrium is Pareto efficient if
  - (i) no externalities or public goods
  - (ii) perfect information
  - (iii) perfect competition
  - (iv) rational individuals

- **Representation with an Edgeworth box**
  - Size of the box is total output of two goods X and Y to be divided between individuals A and B
  - The contract curve shows the combinations (X,Y) for which the marginal rate of substitution between the two goods are the same for both individuals
  - Any movement away from the contract curve makes at least one person worse off

Figure 1 – Pareto-Efficient Allocations in a Two-Individual, Two-Good Economy

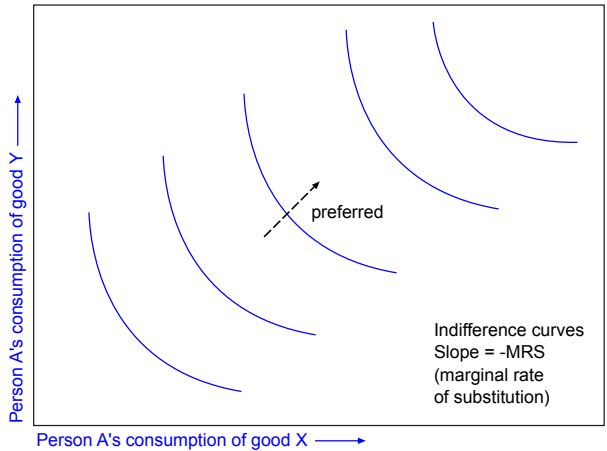


Figure 2 – Pareto-Efficient Allocations in a Two-Individual, Two-Good Economy

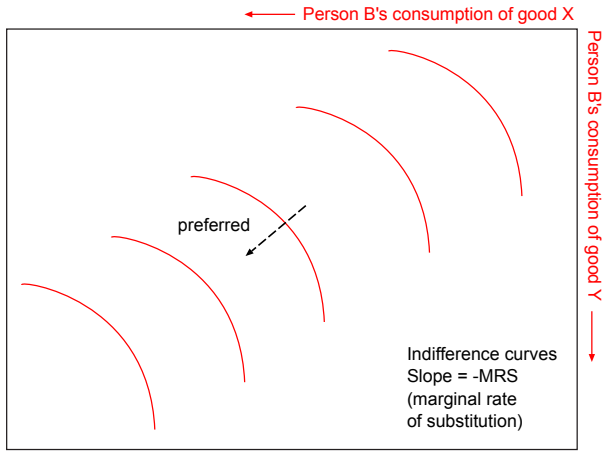


Figure 3 – Pareto-Efficient Allocations in a Two-Individual, Two-Good Economy

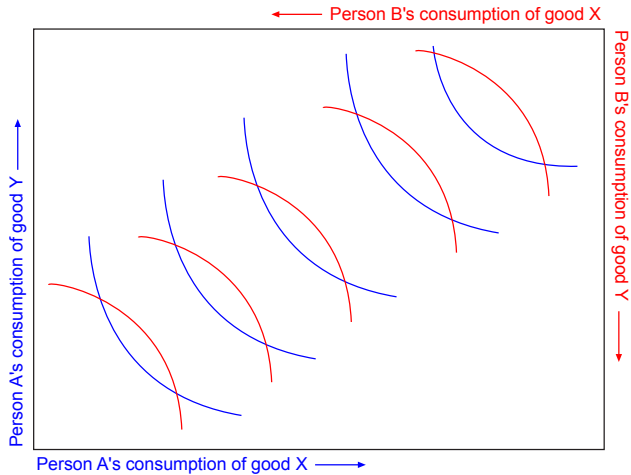


Figure 4 – Pareto-Efficient Allocations in a Two-Individual, Two-Good Economy

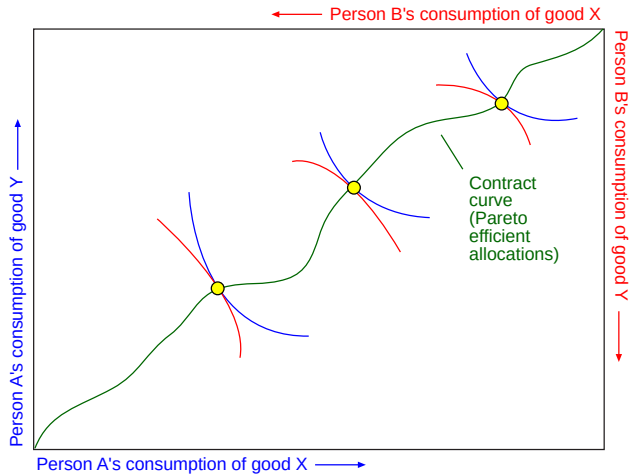


Figure 5 – Pareto-Efficient Allocations in a Two-Individual, Two-Good Economy

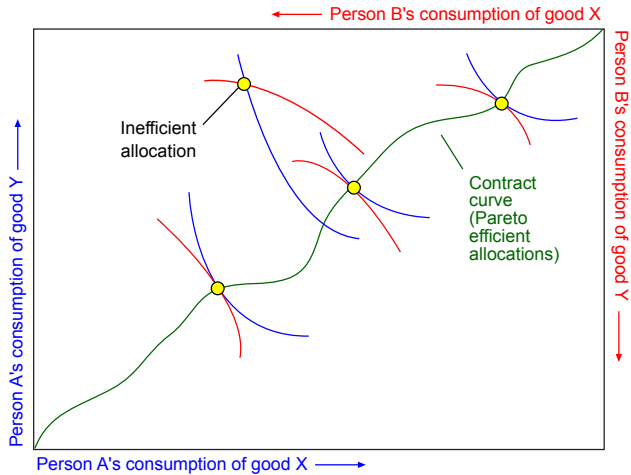
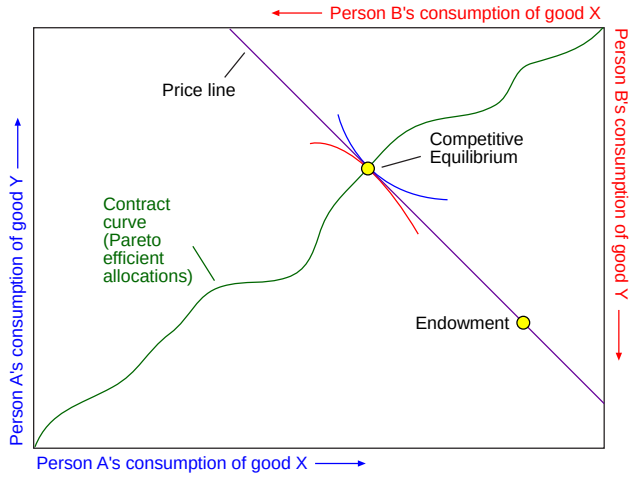


Figure 6 – First Welfare Theorem



Efficiency rationales for state intervention

- **Conditions are not fulfilled for the first welfare theorem**
  - Market failures
  - Individual failures

- **Rationales for government interventions**
  1. Enforcing contracts and property rights
  2. Externalities require government interventions
     e.g., Pigouvian taxes/subsidies, public good provision
  3. Imperfect or asymmetric information
     e.g., adverse selection may call for mandatory insurance
  4. Imperfect competition requires regulation
  5. Correct individual failures (or internalities)
     e.g., hyperbolic agents may not save enough

Enforcement of property rights and contracts

- **Markets do not exist ex abstracto**
  - Reputation mechanisms can work on small scale (Greif, 1993)
- **Markets require secured property rights**
  - Need for legal code, police and justice to ensure that private contracts are enforceable
  - Government intervention is critical on a larger scale when economic exchanges become impersonal (Dixit, 2004)
- The **State monopoly of legitimate violence** helps individuals exploiting the possibilities of mutual gains and avoiding the war of all against all
- The government might **prevent or restrict the existence of markets** on moral/ethical grounds :

  Ex : prohibition of the market for organs

Correction of Market Failures

- Private markets provide a Pareto efficient outcome under **three conditions** :
  1. No exernalities / public goods
  2. Perfect information
  3. Perfect competition
- **Market failures** refer to the violations of either of these conditions :
  1. Externalities and public goods
  2. Asymmetric information
  3. Imperfect competition

Market Failure 1 : Externalities and Public Goods

- **Public Goods**
  - goods that are non-rival and non-excludable in consumption (e.g. national defence)
    $\Rightarrow$ Because of free riding, too little public goods are produced

- **Externalities**
  - production or consumption of goods and services imposes costs or benefits on others
  - not reflected in the prices charged for the goods and services
    $\Rightarrow$ too much of negative externality-generating goods
    e.g., pollution ;
    $\Rightarrow$ too little of positive externality-generating goods
    e.g., R&D

Market Failure 2 : Asymmetric Information

- When some agents have more **information** than others, markets can fail

e.g., The market for second-hand cars or "lemons" (Akerlof, 1970). Sellers have private information on the quality of their cars, which is unknown to buyers $\rightarrow$ sellers of high quality cars withdraw from the market

e.g., Adverse selection in health insurance markets. Healthy people drop out of the private insurance market $\rightarrow$ mandated coverage could make everyone better off

e.g., Credit constraints in the education market $\rightarrow$ subsidies for education

Market Failure 3 : Imperfect Competition

- When **markets are not competitive**, there is role for public intervention

  Ex 1 : natural monopolies such as electricity or railways

  Ex 2 : anticompetitive practices such as collusion between firms or abuse of dominant position (e.g. predatory pricing)

- This topic is traditionally left to courses on **industrial organization** and is not covered in this course

Correction of "Individual Failures"

- A recent addition to the list of potential failures that motivate public intervention : **people are not fully rational**
- Examples of bounded rationality have been identified by **behavioral economics** (cf. Kahneman and Tversky, 1979) :
  - Hyperbolic discounting (Laibson, 1997)
  - Overconfidence (Della Vigna and Malmendier, 2006)
  - Default options (Madrian and Shea, 2001)
  - Inattention (Lacetera, Pope and Sydnor, 2012)
- **Public intervention** (e.g. by forcing saving via social security, enforcing the use of seatbelts for drivers) may be desirable
- Conceptual challenge : how to avoid the **paternalism critique** ?

The case of merit goods

- **Merit Goods**
  - A commodity which is judged that an individual or society should have on the basis of some concept of benefit, rather than ability and willingness to pay (Musgrave, 1959)

e.g., provision of food stamps to assist nutrition
e.g., the delivery of health services to improve quality of life and reduce morbidity
e.g., subsidized education to improve productivity of the population

- **Efficiency arguments**
  - A response to externality arguments
  - Merit goods as a response to a consumption externality
  - Merit goods as a response to mistaken preferences : policy makers might regard individual preferences as "wrong" (e.g., myopia)

Equity objectives of the welfare state

- Even when the private market outcome is efficient, it may not have good **distributional properties** : markets generally seem to deliver very large rewards to a small number of people
- The choice between different efficient outcomes raises the tricky issue of making interpersonal comparisons, which involve **value judgements**
- A common way of representing such value judgements is the **social welfare function**, a function that maps the set of individual utilities in society into an overall social utility function

Second Welfare Theorem Fallacy

- **Theorem 2** : any efficient allocation can be achieved as a competitive equilibrium
  (i) same conditions as theorem 1
  (ii) lump-sum taxes/transfers are feasible

- **Why fallacy ?**
  - Lump-sum tax/transfers are not available
  - Hence we do not live in First Best world

Lump-sum taxes and transfers

- **Definition**
  - Lump-sum taxes are fixed in amount and are such that no action can reduce their burden.

    e.g., poll tax (possibly by age and sex)

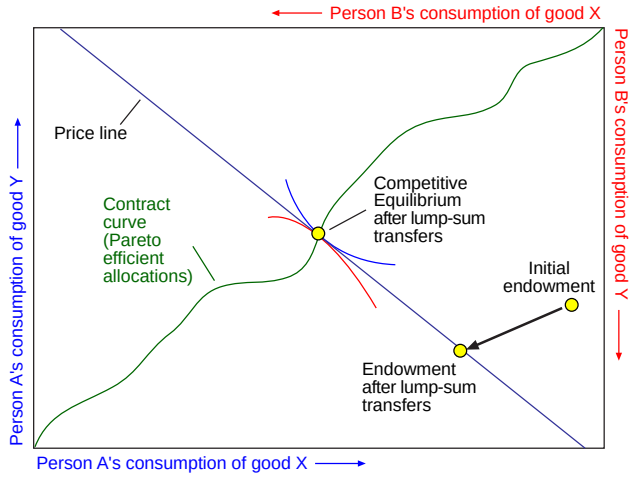
- **Lump-sum taxes are rare because of information constraints**
  - Intrinsic characteristics are not observable

    e.g., ability is not observable, income is
  - Possible lump-sum taxes are usually unfair

    e.g., poll tax

- **Policy as a second-best problem**
  - First best : use of lump-sum taxation
  - Second best : use of other taxes that might be distortionary

Figure 7 – Second Welfare Theorem



Roles of Government

- The two welfare theorems provide **two main justifications for government intervention** :
  I. **First role of government** : improve efficiency when private markets are inefficient
  II. **Second role of government** : improve distribution if private market outcomes are undesirable due to redistributional concerns

Figure 9 – First Role for Government : Improve Efficiency

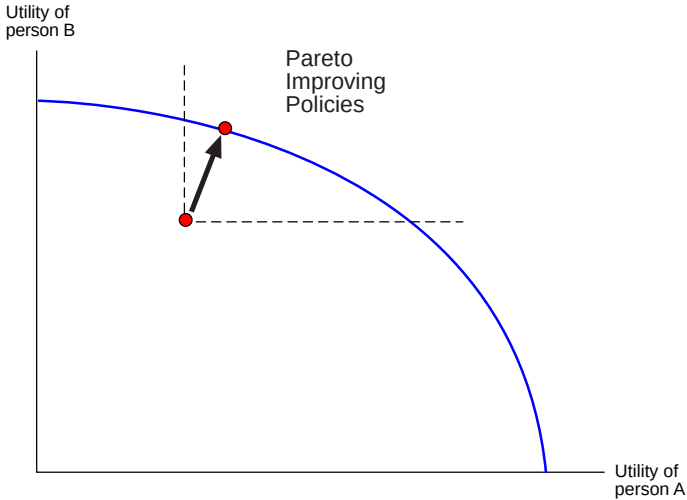
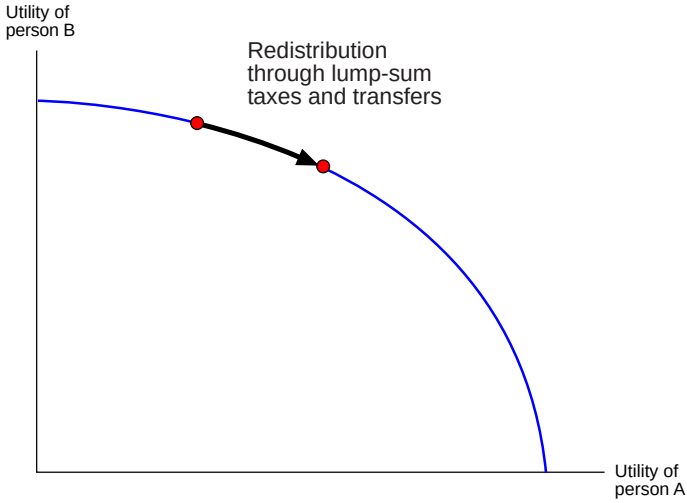


Figure 10 – Second Role : Improve Distribution



The Basic Criteria of Welfare Analysis

- **Optimal taxation approach**
  - Specify a social welfare function (SWF) and describe policy x which maximizes the $SWF(x)$
  - Optimal taxation approach (Mirrlees, 1970)
  - More general approach in public economics (Kaplow, 2008)

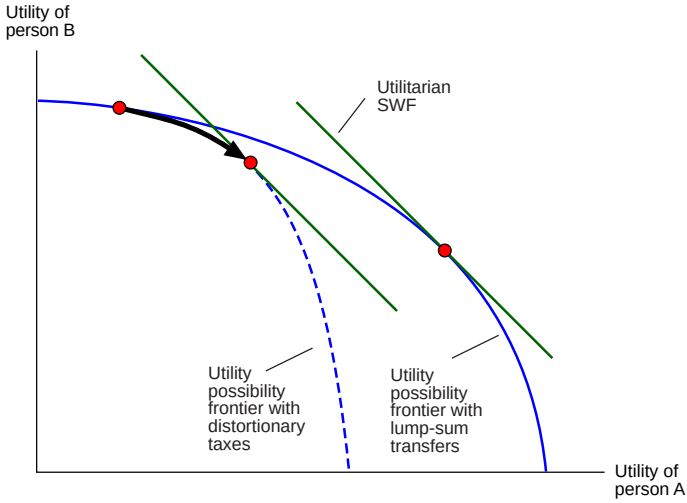
Second Role for Government : Improve Distribution

- **Examples of social welfare functions** (see Lecture 2) :
  - **Utilitarian SWF** : $\boxed{W = \sum_i U_i(.)}$
    Each individual has the same weight in the SWF
    Redistribution may occur because of differences in marginal utilities $U_i'(.)$
  - **Rawlsian SWF** : $\boxed{W = \min_i U_i(.)}$
    Maximize the well-being of the worst-off person in society
  - **General SWF** : $\boxed{W = \sum_i V(U_i(.))}$
    with $V(.)$ concave transformation of individual utilities
    Concavity of $V(.)$ determines the collective preference for redistribution, from utilitarian to Rawlsian

Second Role for Government : Improve Distribution

- If the government can use **lump-sum taxes and transfers** (i.e. taxes and transfers which depend on exogenous characteristics of individuals), redistribution can be made without distortion, by reallocating initial endowments (second welfare theorem)
- In practice, governments do not observe initial endowments (including earnings ability) and have to rely on **distortionary taxation** : income tax, consumption tax, etc.
- The distortion caused by taxation creates a **deadweight loss** : redistribution entails efficiency costs (e.g. redistribution on the basis of income creates disincentives to work)
- The choice of an optimal policy often entails an **efficiency-equity tradeoff**

Figure 11 – Equity-Efficiency Tradeoff



Okun's leaky bucket

Arthur Okun (1928–1980)
American macroeconomist
Chair of President Johnson's Council of Economic Advisors in 1968 and 1969.

Equality and Efficiency : The Big Tradeoff (1975)

- **Okun's leaky bucket**
  - A metaphor for deadweightloss implied by redistribution
  - "*the money must be carried from the rich to the poor in a leaky bucket. Some of it will simply disappear in transit, so the poor will not receive all the money that is taken from the rich.*" (Okun, 1975, p. 91)
  - Causes of leakage include administrative cost, reduction in work effort, saving, investment, tax evasion, etc.

II. Public policy evaluation

1. **How** should the government intervene ?
2. **What** are the effects of alternative policies ?
3. **Why** do governments act the way they do ?

How should the government intervene ?

- Several policy options :
  - Using the **price mechanism** with taxes or subsidies (e.g., carbon tax)
  - **Mandate** that either individuals or firms provide the good (e.g., car insurance mandate)
  - **Public provision** (e.g., publicly provided education)
  - **Redistribution through tax and benefit** (e.g., housing benefit)
  - **Public financing of private provision** (e.g., construction of highways)
- The question is then : what tool should the government use and how to set the level of use of that tool ?

How should the government intervene ?

- Example of tools : suppose that the government wants to raise the educational attainment of low-income individuals :
  - Increase direct provision of education in low-income districts
  - Provide vouchers to low-income families
  - Increase incentives to tax breaks/credits
  - Mandate longer schooling days, smaller class sizes, new organization of curriculum, etc.
- The evaluation of alternative options naturally leads to the next question : what are the effects of alternative interventions ?

What are the effects of alternative policies ?

- In assessing the effects of alternative interventions, policy makers must keep in mind that any policy has **two types of effects** :
  1. **Direct (mechanical) effects** : effects that would be predicted if individuals do not change their behavior in response to the interventions

e.g., the government creates an *ad valorem* 10% tax on sodas. 1 million packs are sold at 10 euros $\Rightarrow$ the tax should raise 1 million euros.

  2. **Indirect (behavioral) effects** : arise because individuals change their behavior in response to the interventions

e.g., the tax will raise the after-tax price of sodas. Hence people will reduce their consumption of sodas $\Rightarrow$ reduces the overall tax revenue and creates a deadweight loss

What are the effects of alternative policies ?

- Two **complementary approaches** to analyze the effects of policies
- **Theoretical analysis** :
  - Essential to understand the complex interactions between policies and behavior : partial/general equilibrium effects, dynamics, uncertainty, etc.
  - But does not usually provide clear predictions on the magnitude of the effects
- **Empirical analysis** :
  - Use data and statistical methods to measure the magnitude of the impact of government policies on individuals and markets
  - Main empirical challenge : identify the causal effect of a policy and not just establish a correlation (cf. M2 Course "Empirical Methods for Policy Evaluation")

What are the effects of alternative policies ?

- **Theoretical toolkit** to understand the interaction between policies and behavior :
  - Partial equilibrium / General equilibrium
  - Dynamics
  - Uncertainty, etc.
- **Empirical methods** to identify and estimate behavioral responses :
  - Disentangling causality from correlation
  - Identification methods
  - Structural vs. reduced-form estimates
  - Long-run vs. short run estimates
  - Randomized experiments

What are the effects of alternative policies ?

- Being able to **critically assess empirical** studies is an important aspect of public policy evaluation
- **Internal validity** :
  - How reliable is the identification strategy ? How far is the experimental design from an ideal experimental design ?
  - How reliable are the data and measurements ? (selection bias, non-response, etc.)
- **External validity** :
  - To what extent can the findings be generalized beyond the particular context under study ?
  - Are there important questions left unanswered ?
  - What are the main policy implications of the findings ?

Why Do Governments Act the Way they Do ?

- Need to recognize that we **cannot simply model governments as benign actors** who intervene only to mitigate market failure or improve the distribution of economic resources
- Often, governments fail to adopt the optimal set of policies. Why ?
- Two types of answers :
  - Optimal policies are not always implementable
  - Governments do not necessarily act as benevolent planners

Optimal policies are not always implementable

- Even a benevolent government may fail to implement optimal policies
- **Collective choice problems** : governments faces the difficult problem of aggregating the preferences of millions of citizens into a coherent set of policy decisions
- **Commitment problems** : some policies may not be perceived as credible by economic agents (e.g. announced government policy of never negotiating with terrorists over the release of hostages)
- Because of **information constraints**, first-best policies can be difficult or impossible to implement and governments often have to rely on instruments which distort incentives (behavioral responses in the private sector)

  $\rightarrow$ **Second-best policies**

"Government failures"

- Policymakers might be motivated by much more than simply correcting market failures or redistributing income : **"government failures"** can lead to inappropriate government interventions
- Politicians and administrations are not a vacuum : they have **interests and preferences** of their own
  - rent-seeking
  - vested interests
  - lobbying
- Their objectives does not necessarily coincide with the social optimum : importance of the **structure of government**
- Information constraints and government failures create a **sharp tradeoff** between the costs and benefits of government intervention

Limitations of Government Intervention

- **Problem :** optimal policies to address market failures are not always implementable
- **Collective choice problems** : governments face the difficult problem of aggregating the preferences of millions of citizens into a coherent set of policy decisions
- **Commitment problems** : some policies may not be perceived as credible by economic agents (e.g. announced government policy of never negotiating with terrorists over the release of hostages)
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  $\rightarrow$ **Second-best policies**

III. Empirics of welfare analysis

- **Causal impacts of policy**
  - "Credibility revolution" (Angrist and Pischke, 2010)
  - Empirical methods to identify the causal impact of policy on a large set of outcomes (efficiency, equity, perception, well-being, etc.)
  - Applied econometrics developed many tools for identification (DiD, RDD, event-study, bunching, etc.)

- **How to translate causal estimates into welfare analysis ?**
  - Need to compare policies on various outcomes
  - Need to relate policies to their public finance costs
  - Need to take into account the cost of public finance (i.e., the efficiency cost of taxation)

III. Empirics of welfare analysis

1. Marginal excess burden (MEB)
2. Cost benefit analysis (CBA)
3. Marginal Value of Public Funds (MVPF)

Main Reference : Hendren and Sprung-Keyser "A Unified Welfare Analysis of Government Policies" *The Quarterly Journal of Economics* (2020)

Marginal excess burden (MEB)

- **Conceptual framework**
  - Imagine doing the policy but closing the budget constraint through individual-specific lump-sum taxation (Auerbach and Hines (2002))
  - Requires compensated not causal effect to calculate MEB
- **Limits of the approach**
  - Hard to measure compensated effects
  - Individual specific transfers are not feasible
  - Assumes budget constraint is closed with a technologically-infeasible policy

Cost benefit analysis (CBA)

- **Conceptual framework**
  - Benefit Cost Ratios (BCR) are a popular method of policy comparison (Stiglitz and Dasgupta (1971); Atkinson and Stern (1974); Kaplow (2011); Boardman (2017))
  - Compare the total benefits to the upfront programmatic cost of a policy

$$BCR = \frac{Social\ benefits\ -\ Social\ costs}{Cost\ of\ the\ policy(1 + \phi_{DWL})}$$

  - Multiply costs by an adjustment for the excess burden of taxation
  - Benefits accruing to the government are included as social costs

Cost benefit analysis (CBA)

- **Limits of the approach**
  - Revenue impacts are included in numerator but they reduce the need to raise revenue and thus the excess burden of taxation
  - They force a particular method of closing the budget constraint (linear taxation)
  - They don't (generally) account for differential distributional incidence of the policy relative to the method used to raise revenue (but it is well known one can incorporate distributional weights)

Marginal value of public funds (MVPF)

- **Conceptual framework**
  - For each policy change, want to construct its implied Marginal Value of Public Funds (MVPF)

$$MVPF = \frac{Benefits\ to\ recipients}{Net\ government\ cost}$$

  - An old idea (Mayshar, 1990; Slemrod and Yitzhaki, 1996, 2001; Kleven and Kreiner, 2006)
  - But only recently popularized and used systematically (Hendren, 2016; Hendren and Sprung-Keyser, QJE 2020; Finkelstein and Hendren, JEP 2020)
  - Still debates going on (Garcia and Heckman, 2022; Hendren and Sprung-Keyser, 2022)

General welfare framework

- **Define social welfare** W

$$W = \sum_i \psi_i U_i$$

  - U_i individual i's utility function
  - ψ_i social welfare weight : how much a 1-unit increase in utility corresponds to an impact on social welfare W

- **Define the individual's social marginal utility of income** η_i
  - $\eta_i = \lambda_i \psi_i$
  - λ_i denote individual i's marginal utility of income
  - η_i measures the impact on social welfare W of an additional \$1 placed in individual i's budget

Impact of policy change on social welfare

- **Consider a reform affecting policy j with dp_j**
  - It can be any policy, either an increase or decrease

  e.g., change in tax rate, education spending, etc.

- **First-order welfare impact**

$$\frac{dW}{dp_j} = \sum_i \psi_i \frac{dU_i}{dp_j} = \sum_i \eta_i WTP_i^j = \bar{\eta}_i \sum_i WTP_i^j$$

  - WTP_i^j is individuals' willingness to pay (WTP) for policy j out of their own income
  - $\bar{\eta}_i$ is the average social marginal utility of the beneficiaries of the policy
  - it measures how much social welfare increases if one were to provide an average of \$1 to the beneficiaries of policy j

Compare policies by normalizing by cost

- **Most policies are not budget neutral**
  - Let R denote the present discounted value of the government budget
  - Let $G_j = \frac{dR}{dp_j}$ denote the net impact of the policy on the government budget
  - G is inclusive both of the initial cost of the program and all other effects of behavioral responses on the government budget

- **The marginal value of public funds of policy j ($MVPF_j$)**

$$MVPF_j = \frac{\sum_i WTP_i^j}{G_j}$$

  - $MVPF_j$ is the aggregate WTP divided by the net cost of the government
  - \$1 of govt spending on the policy delivers \$MVPF benefits to the beneficiaries
  - policy j delivers $\bar{\eta}_j MVPF_j$ in social welfare

Use of MVPF to compare policies

- **Hypothetical budget-neutral policy changes**
  - Take two (non-budget neutral) policies : policy 1 and policy 2
  - Consider budget neutral policy *dp* : increase spending on policy 1 financed from less spending (or greater revenue) from policy 2
  - Condition for the policy to increase welfare :

$$\bar{\eta}_1 MVPF_1 > \bar{\eta}_2 MVPF_2$$

- **Comparisons of policies**
  - One can compare policies with the same beneficiary group ($\bar{\eta}_1 \approx \bar{\eta}_2$)

  $\Rightarrow$ compare MVPF to assess social welfare
  - One can compare policies with a similar redistributive objective using MVPFs :

  e.g., food stamps vs housing vouchers vs cash transfers

Interpretation of MVPF

- **General interpretation**
  - MVPF measures the amount of welfare that can be delivered to policy beneficiaries per dollar of government spending on the policy
  - MVPF measures the feasible trade-offs : Okun's "leaks in the bucket"

- **Specific cases of MVPF**
  - $MVPF = 1$: a non-distortionary transfer from the government to an individual
  - $MVPF = +\infty$: "the policy pays for itself", positive fiscal externalities are large enough to offset the initial cost of the policy
  - $MVPF = +\infty$ requires $WTP >$ and $Net\ cost < 0$

- **Low MVPF are not always undesirable**
  - It can be costly to redistribute towards certain groups but justified depending on social preferences

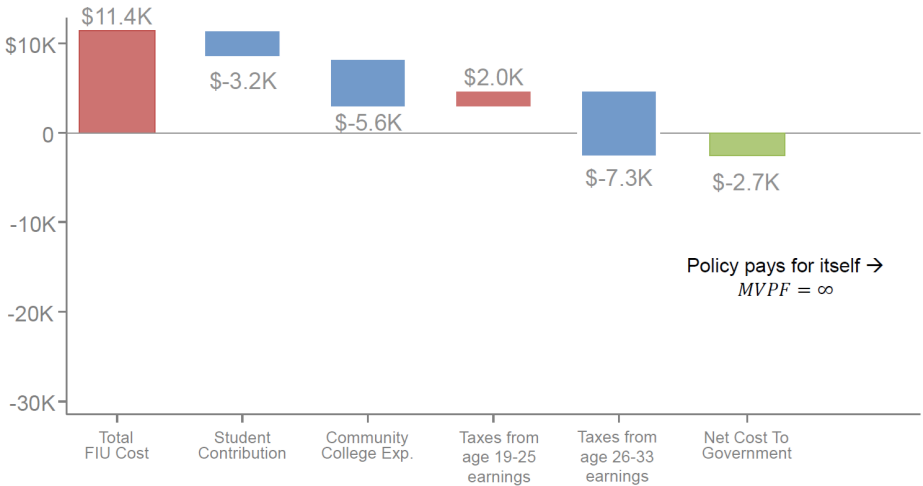
e.g., policies providing transfers to disabled children have low MVPFs

Hendren and Sprung-Keyser (QJE, 2020)

- **Systematic computation of MVPF**
  - They construct 133 MVPFs for policies in social insurance, education and job training, taxes and cash transfers, and in-kind transfers in the U.S.
  - They use existing research on causal impact of policies
  - They build a library of MVPF : https://policyimpacts.org/

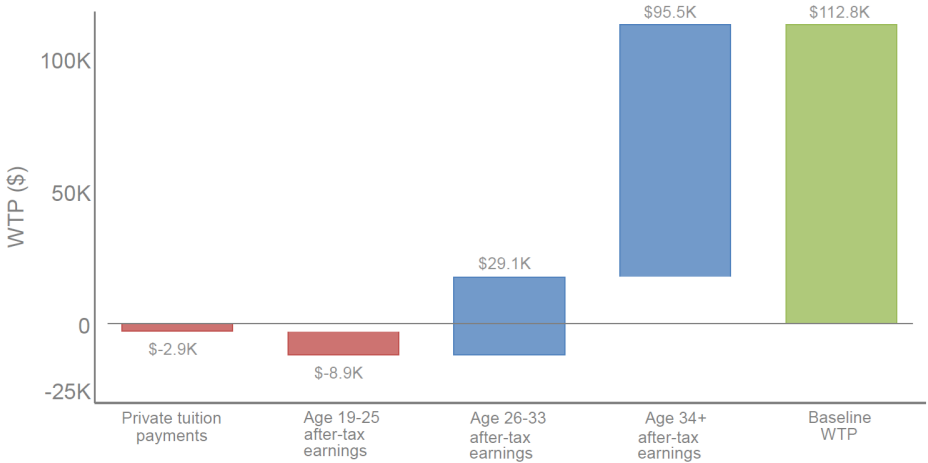
- **Example from Admission to Florida International University**
  - Zimmerman (JLE, 2014) uses RDD to estimate the impact of admission into FIU
  - The marginal admission yields earnings gains of 22% between 8 and 14 years after high school completion
  - Computation of direct cost and net costs of the program

Figure 12 – Net cost to government of Admission to Florida International University



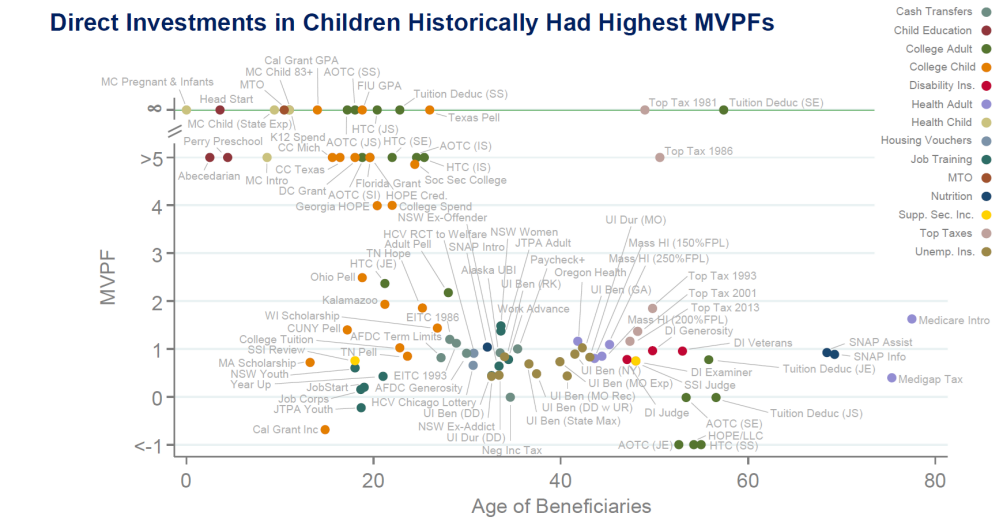
SOURCE : Hendren and Sprung-Keyser (2020), Fig. 1.A, p. 1228.

Figure 13 – Willingness to Pay for Admission into Florida International University



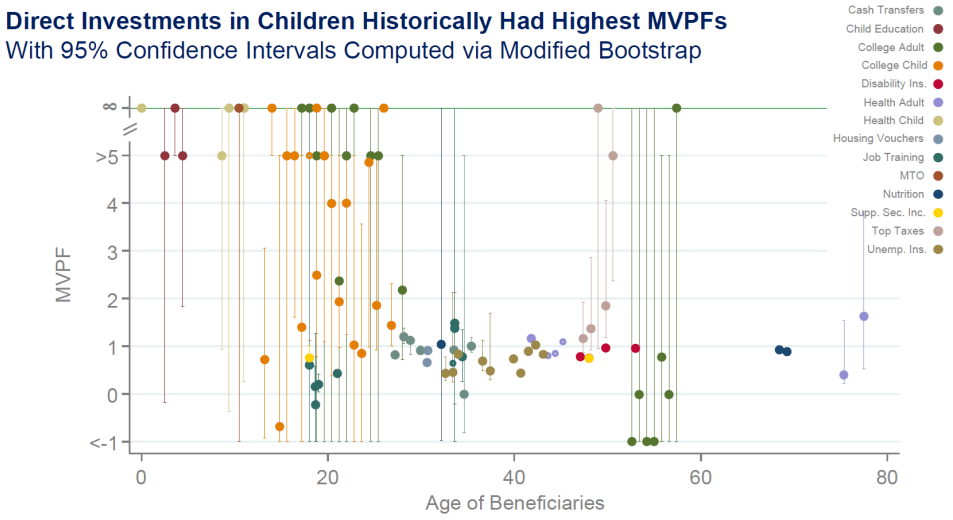
Source : Hendren and Sprung-Keyser (2020), Fig. 1.C, p. 1228.

Figure 14 – MVPF Estimates by Age of Policy Beneficiary



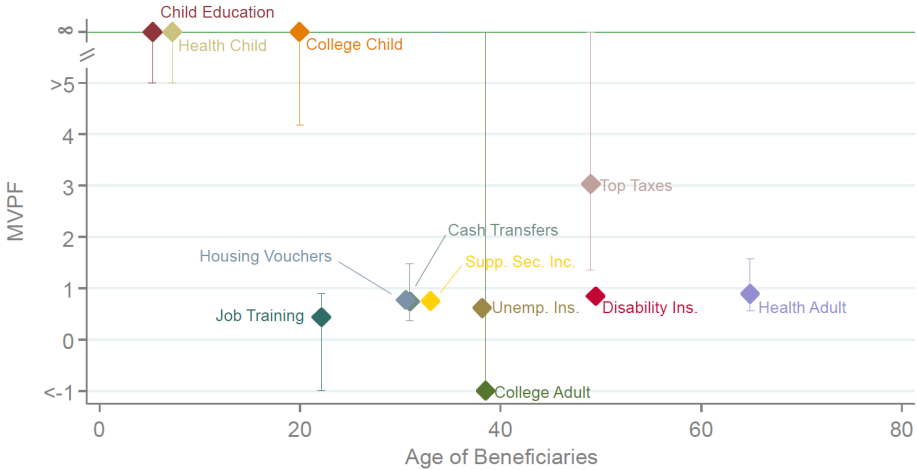
SOURCE : Hendren and Sprung-Keyser (2020), Fig. 3, p. 1248.

Figure 15 – MVPF Estimates with Confidence Intervals



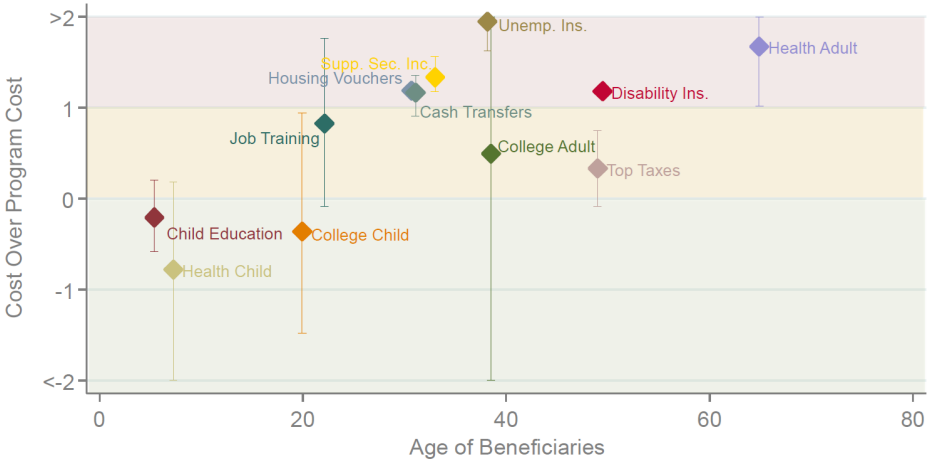
Source : Hendren and Sprung-Keyser (2020), Fig. 4.A, p. 1251.

Figure 16 – MVPF Estimates and Category Averages



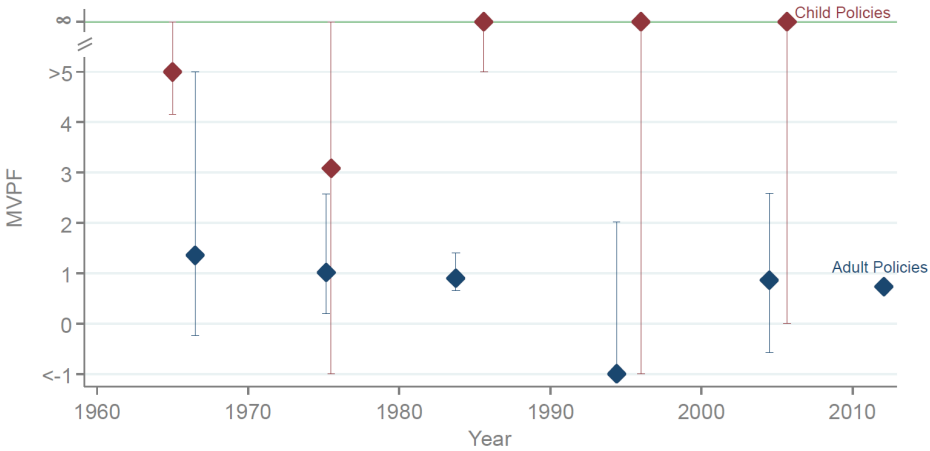
SOURCE : Hendren and Sprung-Keyser (2020), Fig. 4.B, p. 1251.

Figure 17 – Net Government Costs per Dollar of Programmatic Spending



Source : Hendren and Sprung-Keyser (2020), Fig. 5, p. 1252.

Figure 18 – MVPFs by Decade



SOURCE : Hendren and Sprung-Keyser (2020), Appendix Fig. 9, p. 1307.

Recap MVPF

- **Learning from comparing policies**
  - General message about investment in children
  - But still large variations between policies
  - And still large uncertainties : need better evaluations !
- **What is needed ?**
  - Measure the direct cost to the government
  - Measure the indirect cost to the government (fiscal externalities)
  - How much are beneficiaries willing to pay ?
  - Who are the beneficiaries

Summary : A Roadmap to Public Policy Evaluation

1. Understand the **economic rationale** for a given policy
2. Analyze what could be the **effects** of such a policy, using economic modeling
3. Think about the best way to **evaluate empirically** the effect of the policy : estimate a causal effect
4. Be able to **critically assess** empirical evaluations of public policies
5. Compute **the welfare effect** of the policy using MVPF to compare alternative options
6. Derive **policy recommendations**

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