# 14.472 Public Finance II

Wrap Up

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# Public Finance

- Emphasis on normative as well as positive
- (Often) a tight link between theory and empirics
- 'Public Finance Mindset': Start by specifying an objective behind potenital government intervention
  - Correcting potential market failures
  - Redistribution
  - Paternalism
  - Other?

# Wrap-up

- Not comprehensive (and not a 'study guide' for the exam)
- Deliberately ignored empirics and focused on (some of the) key concepts I hope you take away for life beyond the exam
- To make it more interesting / novel, I am doing Nathan's lectures (and vice versa)

# Key Ideas from Nathan's Lectures

- MVPF
- envelope theorem
- envelope theorem
- MVPF
- MVPF
- envelope theorem

# Overview of Nathan's Lectures

- Social Welfare Functions and Redistribution (or do we mean insurance?!)
- Redistribution Topics:
  - Empirical Welfare analysis and MVPF
  - Atkinson-Stiglitz and Potential violations
    - Cash vs. In Kind
    - Self-targeting
    - Place-based policies
- Social Insurance:
  - Optimal Social Insurance: Baily-Chetty

# Social Welfare Functions and Redistribution

- Individualistic social welfare function:

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

  - Precludes 'society cares about...'
- 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
- Also common to use fixed weights

$$SW(x) = \int \psi_i u_i(x)f(i)di$$

- Reminder: Two sources of concavity

# Why is the government involved in redistribution?

- Public good / non-excludability –> free rider problem
  - Private provision of redistribution is sub-optimally low
- Is it redistribution or insurance behind the veil of ignorance?
  - Is there a market for / would you 'buy' redistribution?
  - Recall reclassification risk and ex-ante utility vs. demand (e.g. Hendren 2017)
    - Trade-off between adverse selection and reclassification risk (Handel/Hendel/Whinston 2015)

# Redistribution: Key Topics

- Motivating insight: Arthur Okun's Leaky Bucket
  - Precludes full redistribution / maximization of SWF
- Two key questions about redistribution:
  - Measuring the leaks: MVPF
  - Minimizing the leaks:
    - In-kind vs Cash
    - Targeting and Self-selection
    - Place-based policies

# 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)

# Example: MVPF for a $1 increase in cash transfer

- 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 behavior, marginal individual who changes 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)
  - Note: have only focused on inframarginals. WTP = height of demand curve; don't need slope (wtp of marginals)
  - WTP for the transfer is just the mechanical cost of the transfer
- Now let's turn to costs...

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

$$MVPF = \frac{\text{"Benefit"} = \$1}{\text{"Net" Cost}}$$

- 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), public health care spending, 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
  - Note this could include other actors, not just government...

# 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

# 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

# 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
    - What if transfer is in kind not cash (see multiple lectures on approaches to estimating WTP)?
    - What if agents are not optimizing?
  - But these are empirical challenges, not conceptual ones.
  - The way forward empirically does not obviously involve estimating the behavioral impacts of the policy

# 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 ('infinite MVPF')
  - Two policies that have same distributional incidence
  - Policies with different distributional incidence

# Using MVPFs

- Negative net costs (policy 'pays for itself'; infinite MVPF)
  - e.g. wrong side of the Laffer curve
  - offers Pareto improvements! too high a standard?
- Policies with same distributional incidence
  - e.g. expand cash welfare (TANF) or expand Earned Income Tax Credit (EITC)
  - policy with higher MVPF is preferred (lower cost way of transferring)
  - key comparative advantage of economists: not defining a social objective but given one, how to achieve at lower resource cost
- Policies with different distributional incidence: need to take a stand on social welfare weights.
  - Inverse optimum approach (existing policies reveal implicit social welfare weights)
  - Introspection / Assumption / philosophy
  - 'Efficient welfare weights': compare to MVPF of a \$1 income tax cut for individuals of a given income

# 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 then (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)

# Minimizing leaks: Atkinson-Stiglitz

- MVPF measures leaks; public finance economist wants to minimize them
- Atkinson-Stiglitz theorem (Kaplow 2006 proof)
  - If preferences are homogeneous and weakly separable in consumption and labor, welfare is maximized when redistribution is carried out solely through an income tax
  - Implications: no capital taxation, don't tax intermediate inputs (Diamond-Mirleees 1971 'production efficiency' theorem) no in-kind transfers etc
- Incredibly important theorem, but mostly for clarifying objects of interest that break it (rather than realism, IMO)

# Beyond Atkinson-Stiglitz

- When would you want to tax (or subsidize) commodities?
- If weak separability and/or homogenous preferences don't hold, then commodity taxes / subsidies can be used for screening or self selection
  - see also Nichols and Zeckhauser toy model for further intuition
- Ferey, Lockwood and Taubinsky (AER 2024): Wedge between causal effect of income on purchase of a good (in their case, savings) and cross-sectional relationship between purchase of good and income is a sufficient statistic for optimal commodity tax
  - If they are the same, then Atkinson-Stiglitz holds and optimal commodity tax is zero
  - Key idea: cross-sectional relationship is the sum of causal effect of income and across-income heterogeneity in preferences, holding income constant

# Main applications we discussed

- In-kind transfers (although recall screening / selection is not the only rationale!)
- Self-selection / ordeals (which we returned to in the targeting lecture)
- Place-based policies
  - Tiebout, Rosen-Roback: what happens when we try to do place-based redistribution
  - Key idea: endogenous price of location

# Optimal Social Insurance Benefits: Baily Chetty

- Model presumes government is intervening and asks about optimal level of benefits
  - Ideally want to also have rationale for government intervention
  - So many questions beyond optimal level of benefits (see 'choice of instrument' lecture!)
- Intellectual history: 80s/90s literature on distortionary effects of social insurance; then comes Gruber (1997)
- What to take away from Baily-Chetty
  - Intuition behind the formula
  - Implications for what causal effects do (and do not!) need to be estimated

# Baily-Chetty

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  - So many questions beyond optimal level of benefits (see 'choice of instrument' lecture!)
- Intellectual history: 80s/90s literature on distortionary effects of social insurance; then comes Gruber (1997)
- What to take away from Baily-Chetty:
  - Understanding of what the formula is (and is not): it's about marginal increases in benefits (not optimal level of benefits)
    - Tradeoffs between 'sufficient statistics' and more 'structural' approachs
  - Intuition behind the formula
  - Implications for what causal effects do (and do not!) need to be estimated

# Benchmark Static Model: Overview

- First best problem:
  - Social planner chooses benefits to maximize utility
    - subject to government break even constraint (benefits financed by tax)
  - Solution: Full insurance
    - Benefits equate MU of consumption across states (employed vs not)
- Constrained efficient problem:
  - Consumers choose search effort based on ue benefits (moral hazard)
  - Social planner chooses benefits to maximize utility subject to
    - Government breaks even (benefits financed by tax)
    - Consumers choose search given benefits
  - Generates first order condition for optimal level of benefits (Baily-Chetty)

## Setup: states and utility

- Binary risk with states high $h$ and low $l$
  - Job loss (UI), health expense (HI), injury at work (Worker's Comp), etc.
  - $e$ is share of time spent in high state, $1 - e$ is share of time in low state
  - Convex cost of effort function: $\psi(e)$
    - Key point: $e$ can be endogenous to benefit design (moral hazard)

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- Hand-to-mouth consumption implies

$$c_h = y_h = w_h - \tau(b)$$
$$c_l = y_l = w_l + b$$

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- Hand-to-mouth consumption implies

$$c_h = y_h = w_h - \tau(b)$$

$$c_l = y_l = w_l + b$$

- State-dependent utility is $v(c_h)$, $u(c_l)$
- Assume $w_l > 0$
  - Can be motivated by spousal income, informal or home production, exogenous assets
  - Remark: Avoids $u'(0) = \infty$

## First best

- Key: social planner can control search effort $e$ (perfect monitoring)
- Set benefits (and taxes) and effort to maximize social welfare subject to the government's break even constraint

$$\max_{b,e} W(b,e) = ev(w_h - \underbrace{\tau(b,e)}) + (1-e)u(w_l + b) - \psi(e)$$
$$s.t. \tau(b,e) = b\frac{(1-e)}{e}$$

Substituting in:

$$\max_{b,e} W(b,e) = ev\left(w_h - b\frac{(1-e)}{e}\right) + (1-e)u(w_l + b) - \psi(e)$$

# First best (con't)

$$\max_{b,e} W(b,e) = ev\left(w_h - b\frac{(1-e)}{e}\right) + (1-e)u(w_l + b) - \psi(e)$$

$$\frac{\partial W}{\partial e} = -\psi'(e) + v(c_h) - u(c_l) - ebv'(c_h)\frac{d}{de}\left(\frac{1-e}{e}\right)$$

$$\frac{\partial W}{\partial e} = 0 \Rightarrow$$

$$\psi'(e) = \underbrace{v(c_h) - u(c_L)}_{\text{probability effect}} + \underbrace{\frac{bv'(c_h)}{e}}_{\text{fiscal effect}}$$

# First best (con't)

$$\frac{\partial W}{\partial b} = -\frac{\partial \tau}{\partial b} e v'(c_h) + (1-e)u'(c_l)$$

$$\begin{aligned} \frac{\partial W(b)}{\partial b} &= 0 \Rightarrow \\ -\frac{1-e}{e} e v'(c_h) &= (1-e)u'(c_l) \Rightarrow \\ v'(c_h) &= u'(c_l) \end{aligned}$$

# First best (comments)

- Define $\lambda(b, e) = \frac{bv'(c_h)}{e}$ as the fiscal saving due to increased effort.
- First order conditions

$$e : \psi'(e) = v(c_h) - u(c_L) + \lambda(b, e)$$

$$b : v'(c_h) = u'(c_l)$$

- Planner chooses effort $e$ so that marginal cost of effort $(\psi'(e))$ equals (social) marginal benefit of effort $v(c_h) - u(c_L) + \lambda(b, e)$
  - Social marginal benefit of effort is the private benefit (difference in utility between employment and unemployment) plus public benefit (fiscal cost of the benefit)
- Planner chooses benefit level $b$ to achieve full insurance $v'(c_h) = u'(c_l)$

# Agent's problem

- Agent chooses search effort $e \in [0, 1]$

$$\max_e V(e) = ev(c_h) + (1 - e)u(c_l) - \psi(e)$$

$$\Rightarrow \psi'(e^*) = v(c_h) - u(c_l) \quad (1)$$

- Key point: Worker equates marginal cost of effort $e$ with *private* marginal benefit of effort (difference in utility between employment and unemployment)
  - Unlike in the first best, they do not take account of the public benefit from effort: reduced taxes due to reduced ue benefts
- Other remarks:
  - This is a static representation of a problem that is actually dynamic. In dynamic formulation, search effort $e$ exerted only when in low state.
  - Assume a continuum of agents so that each agent's decision $e$ has no effect on tax rate $\tau(b)$.
  - Cost of effort $\psi(e)$ is additively separable. Can imagine richer utility functions.

# Public cost of raising benefits (ignored by agent)

- Actuarially fair tax $\tau(b,e) \equiv b\frac{1-e}{e}$.

$$\begin{aligned}\frac{d\tau(b,e)}{db} &= \frac{d}{db}(b)\frac{1-e}{e} + b\frac{d}{db}\left(\frac{1-e}{e}\right) \\ &= \frac{1-e}{e} - b\frac{de}{db}\frac{1}{e^2} \\ &= \underbrace{\frac{1-e}{e}}_{\text{mechanical cost of higher b}} + \underbrace{\left(\frac{de}{db}\right)\frac{d}{de}\tau(b,e)}_{\text{behavioral cost of higher b}} \end{aligned} \tag{2}$$

- Remarks:
  - $e$ is share of time employed so $\frac{de}{db} < 0$.
  - This decomposition into the mechanical (holding behavior constant) cost versus behavioral cost (fiscal externality) will come up again later

# Planner's (second best, constrained efficient) problem

$$\max_b W(b) = ev(w_h - \tau(b,e)) + (1-e)u(w_l + b) - \psi(e)$$

$$\text{subject to } e = e^*(b); \tau = b\frac{(1-e)}{e}$$

$$\frac{dW(b)}{db} = -\frac{d\tau}{db}e^* v'(c_h) + (1-e^*)u'(c_l) + \underbrace{(-v(c_h) + v(c_l) - \psi'(e^*))}_{\text{zero by equation (1) - agent foc}}\frac{de^*}{db}$$

- Because at the margin worker indifferent between cost and benefit of additional unit of search effort, impact of benefit on search effort drops out (**envelope theorem**). Will discuss more later.

# Planner's problem (con't)

$$\frac{dW(b)}{db} = -\frac{d\tau}{db} e^* v'(c_h) + (1-e^*)u'(c_l) + \underbrace{(-v(c_h) + v(c_l) - \psi'(e^*))}_{\text{zero by equation (1) - agent foc}} \frac{de^*}{db}$$

- Key differences from first best: $\frac{d\tau}{db}$ now includes the mechanical cost (as before) and the behavioral cost (new to second best with agent choice):

$$\frac{d\tau(b)}{db} = \underbrace{\frac{1-e}{e}}_{\text{mechanical cost of higher b}} + \underbrace{\left(\frac{de}{db}\right)\frac{d}{de}\tau(b,e)}_{\text{behavioral cost of higher b}}$$

  - Note: the reason that impact of benefits on employment (ue duration) matters is because of the budget constraint (keep this in mind; will come back to)

# Planner's problem (con't)

- Using the agent's foc for $e$ we get:

$$\frac{d\tau(b)}{db} = \underbrace{\frac{1-e}{e}}_{\text{mechanical cost of higher b}} + \underbrace{\left(\frac{de}{db}\right)\frac{d}{de}\tau(b,e)}_{\text{behavioral cost of higher b}}$$

$$\begin{aligned}\frac{dW(b)}{db} &= (1-e)u'(c_l) - \frac{d\tau}{db}ev'(c_h) \\ &= (1-e)\left[u'(c_l) - (1+\frac{\varepsilon_{1-e,b}}{e})v'(c_h)\right]\end{aligned}$$

where $\varepsilon_{1-e,b} \equiv \frac{d(1-e)}{db}\frac{b}{1-e}$ denotes the elasticity of the probability of being in the bad state w.r.t. the benefit level.

# Planner's problem (con't)

$$\frac{dW(b)}{db} = (1-e)\left[u'(c_l) - (1+\frac{\varepsilon_{1-e,b}}{e})v'(c_h)\right]$$

- This equation is hard to interpret because it is in utils.
- Conventional to normalize the welfare gain from a \$1 (balanced budget) increase in the social insurance benefits by the welfare gain from raising the wage bill by \$1 in the "high" state

$$M_W(b) \equiv \frac{\frac{dW(b)}{db}/(1-e)}{\frac{dW}{dw_h}/e} = \frac{u'(c_l) - (1+\frac{\varepsilon_{1-e,b}}{e})v'(c_h)}{v'(c_h)} = \frac{u'(c_l) - v'(c_h)}{v'(c_h)} - \frac{\varepsilon_{1-e,b}}{e}$$

# Baily (1978)-Chetty (2006) formula.

$$M_W(b) = 0 \Rightarrow$$

$$\underbrace{\frac{u'(c_l) - v'(c_h)}{v'(c_h)}}_{\text{welfare gain from increase in insurance}} = \underbrace{\frac{\varepsilon_{1-e,b}}{e}}_{\text{fiscal cost of increasing insurance}}$$

# Baily (1978)-Chetty (2006) formula. LHS.

$$\underbrace{\frac{u'(c_l) - v'(c_h)}{v'(c_h)}}_{\text{welfare gain from increase in insurance}} = \underbrace{\frac{\varepsilon_{1-e,b}}{e}}_{\text{fiscal cost of increasing insurance}}$$

- LHS: difference in marginal utilities across state (i.e. MU(c) when unemployed minus MU(c) when employed) = wedge in full consumption smoothing
  - quantifies welfare gain from transferring additional $ to the unemployed state. (Gain comes from smoothing consumption)

# Remark: envelope theorem

$$\underbrace{\frac{u'(c_l) - v'(c_h)}{v'(c_h)}}_{\text{welfare gain from increase in insurance}} = \underbrace{\frac{\varepsilon_{1-e,b}}{e}}_{\text{fiscal cost of increasing insurance}}$$

- Key concept on LHS: envelope theorem
  - Use of envelope theorem: impact of benefits on "effort" ($e$) only enters formula through government balanced budget constraint because agent already optimizing.
  - So other effects of search effort (e.g. on match quality /wages) on worker utility similarly drop out by envelope argument.
    - Don't need to measure all effects on work - on margin worker is optimizing so can just measure summary effect on behavior through impact on government expenditures

# Robustness of formula

- Chetty (2006) shows that Baily is robust to several extensions:
  - E.g. improved match quality (wage gains) from more search
  - Leisure benefits of unemployment
  - Borrowing constraints
- (Common) Intuition: the behavioral elasticities that enter the formula are all functions of other aspects of the agent's behavior and preferences
  - Extra benefits from search (improved match quality) already internalized by agent – exploiting envelope condn
  - Borrowing constraints generate larger drop in consumption hence raise optimal benefit level
  - If ue has large leisure benefits, agents elect longer duration and have larger consumption drop $\longrightarrow$ higher optimal benefit rate

# Some cases where formula would need to be modified

- Externalities
  - Aggregate demand effect - product demand inefficiently low in a recession; higher UI generosity can raise aggregate demand
  - Rat race effect - if more generous UI causes some workers to search less and the number of jobs is fixed
  - Vacancy Posting Effect: if more generous UI means workers demand higher wages, expected profits from posting a vacancy falls, vacancy posting falls, and ue rises
- Internalities (optimization failures by unemployed workers)
  - Coined by Herrnstein et al. (1993)
    - "An internality is the long-term benefit or cost to an individual that they do not consider when making the decision to consume a good or service."
  - Examples motivated by behavioral theories of self-control: smoking, exercise
  - When agent optimization fails, Baily-Chetty no longer sets optimal UI benefits

# Baily (1978)-Chetty (2006) formula. RHS.

$$\underbrace{\frac{u'(c_l) - v'(c_h)}{v'(c_h)}}_{\text{welfare gain from increase in insurance}} = \underbrace{\frac{\varepsilon_{1-e,b}}{e}}_{\text{fiscal cost of increasing insurance}}$$

- RHS: social cost of transferring a \$ to the unemployed state due to the behavioral response (moral hazard effect of increased benefits)
- This fiscal externality of behavioral response on the government budget (bc has to finance an increase in benefits with taxation) is not taken into account in the worker's optimization (choice of $e$)
  - This introduces the wedge from the first best (i.e. full consumption smoothing)
  - Requires estimate of causal impact of increase in benefits (financed by increase in taxes) on government expenditure on unemployment benefits
- As the behavioral effect $\frac{\varepsilon_{1-e,b}}{e}$ approaches zero, the optimal benefit policy approaches the first best.

# Remark: Fiscal Externalities

- Key concept on RHS: fiscal externality
  - Causal impact of increase in benefits (financed by increase in taxes) on government expenditure on unemployment benefits
- In this example, arises by impact of increased benefits on unemployment duration
- But there could be other behavioral responses to increase in UI benefits that generate additional fiscal externalities:
  - Increased wages
  - Increased entry into unemployment
  - Impacts on health and hence public health care expenditures?
- Lee et al. (2021) emphasizes the key cost measure is the (total) negative fiscal externality

# Remark: Baily-Chetty is a local result

$$M_W(b) = 0 \Rightarrow$$

$$\underbrace{\frac{u'(c_l) - v'(c_h)}{v'(c_h)}}_{\text{welfare gain from improvement in insurance}} = \underbrace{\frac{\varepsilon_{1-e,b}}{e}}_{\text{welfare loss from higher taxes}}$$

- Recall derivation: Baily formula is the FOC to a constrained optimization problem
- At optimum, Baily formula should be satisfied (SMB = SMC)
  - Because of concavity, inequality can tell you if current benefits too high or too low (local result)
  - Can (and will) evaluate $M_W(b)$ away from the optimum benefit
  - Does not tell you (globally) optimal level of benefits
    - Would need a fully, structural model

# Remark: An odd social insurance formula

- Formula derived assuming absence of private insurance
  - Not robust to having a private insurance market (which responds endogenously to change in social insurance program)
  - Intuition: recall use of envelope condition in deriving formula
    - Existence of adverse selection $\longrightarrow$ envelope thm violated (externalities from own behavior on private insurance market)
    - Chetty and Saez (2010) try to extend Baily Chetty to cases w private market failures
  - Strange tension given motivation for social insurance!
- Paper has been (mis)interpreted as being about optimal social insurance
  - Really about optimal insurance
  - Except that it mandates participation (no selection margin)

# Baily-Chetty Summary

- Welfare costs (RHS) from higher benefits are captured by the impact of households' behavioral repsonses to the policy on government's budget ("**fiscal externality")**
- Welfare gains (LHS) from higher benefits are captured by the gap in marginal utility of consumption across states of nature
  - This gap is zero in the first best allocation (marginal utilities are constant across states of nature)
  - Size of gap measures market inefficiency and quantifies potential benefit from additional benefits
- Empirical marching orders:
  - Measuring the RHS: Impact of higher UI benefits on government budget (via behavioral responses of individual)
  - Measuring the LHS: Gap in marginal utility of consumption between employed and unemployed state

# Overview of Nathan's Lectures

- Social Welfare Functions and Redistribution (or do we mean insurance?!)
- Redistribution Topics:
  - Empirical Welfare analysis and MVPF
  - Atkinson-Stiglitz and Potential violations
    - Cash vs. In Kind
    - Self-targeting
    - Place-based policies
- Social Insurance:
  - Optimal Social Insurance: Baily-Chetty

# For Final Exam: What's Your Favorite Theorem?

- Envelope theorem:
  - Many things you might have estimated (or planned to estimate) aren't needed
- Theory of the second best
  - Everything is an empirical question / requires empirical estimates