Optimal Design of Welfare-to-Work Programs

2013 Annual Meetings of the Society for Economic Dynamics

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Optimal Design of Welfare-to-Work Programs

Research agenda developed with:

Nicola Pavoni (Bocconi University)

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Nicola Pavoni (Bocconi University)

More recently, joined by:

Ofer Setty (Tel Aviv Univ.) & Conny Wunsch (VU Univ. Amsterdam)

Welfare-to-Work (WTW) programs

- Government programs targeted to the poor & out of work
- Offer income support & promote economic self-sufficiency
- Public insurance - private incentives trade-off
- Programs include a variety of policy instruments

Components of Welfare-to-Work (WTW) programs

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- Transitional Work: “stepping stone” to private sector job
- Training... not today

Diversity of WTW programs across U.S. states

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Diversity of WTW programs across U.S. states

- 1996 Welfare Reform
- Removed federal authority over structure of programs
- Individual states have flexibility over:
  - design of the WTW program (i.e., mix of policy instruments)
  - generosity of Temporary Assistance for Needy Families

Use of policy instruments across U.S. states

Fraction of welfare (TANF) recipients

State	Inactive	Search	Work	Training
Illinois	0.43	0.03	**0.42**	0.12
Pennsylvania	0.63	0.07	0.09	**0.21**
Michigan	0.72	**0.18**	0.04	0.06
New York	**0.84**	0.03	0.08	0.05

Source: Department of HHS: Year 2009

Generosity of TANF benefits across U.S. states

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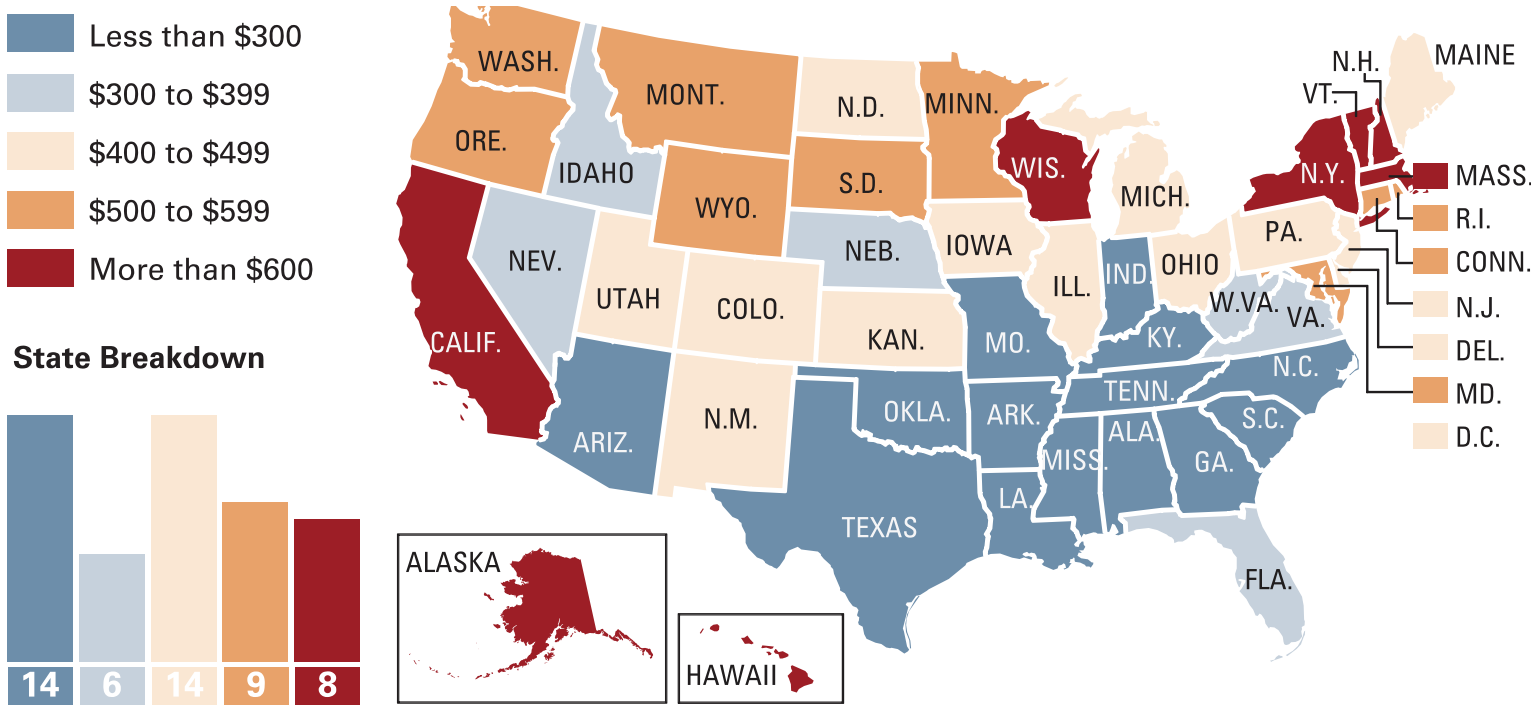
Maximum monthly benefits for single parent of 2 children



Source: CLASP: Year 2010

Language

- *Policy: a prescription of an activity (search, work, train, or rest) to the participant, with an associated conditional transfer*
- *WTW program: a government expenditure program that combines different policies together*
- *Generosity of a WTW program: level of expected utility delivered to the participant (transfers and effort required by activity)*
- *Optimal WTW program: minimizes government expenditures s.t. delivering a given level of ex-ante utility to the participant*

Question

How to optimally design a welfare-to-work (WTW) program

- Approach: dynamic contracting
  - Shavell-Weiss (1979): private information is job-search effort
  - Hopenhayn-Nicolini (1997): recursive formulation

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- Generalization of optimal UI problem
  - additional technologies $\leftrightarrow$ policies
  - human capital $\leftrightarrow$ agent heterogeneity

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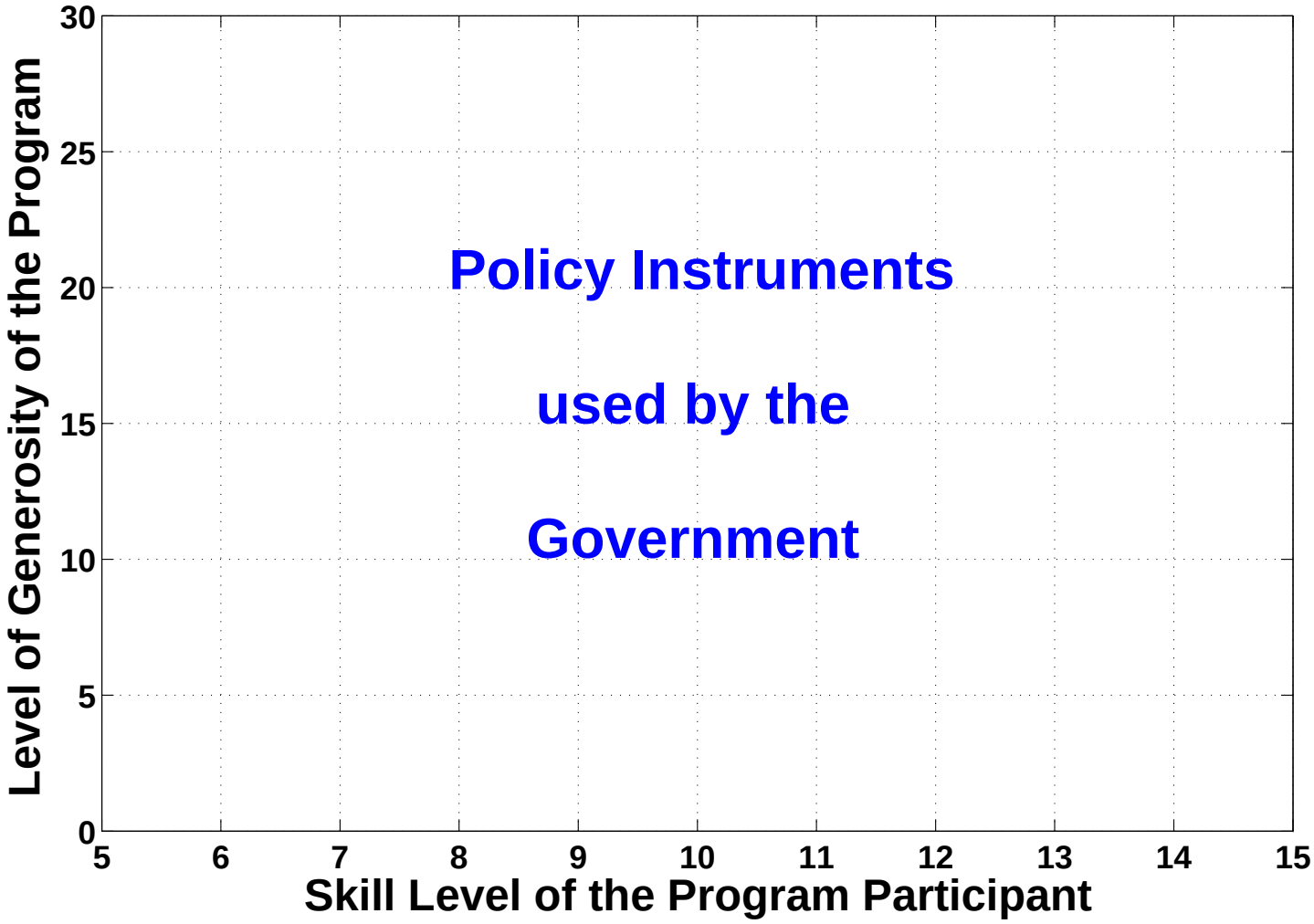
Which policy instrument is best for whom?

Goal of this talk



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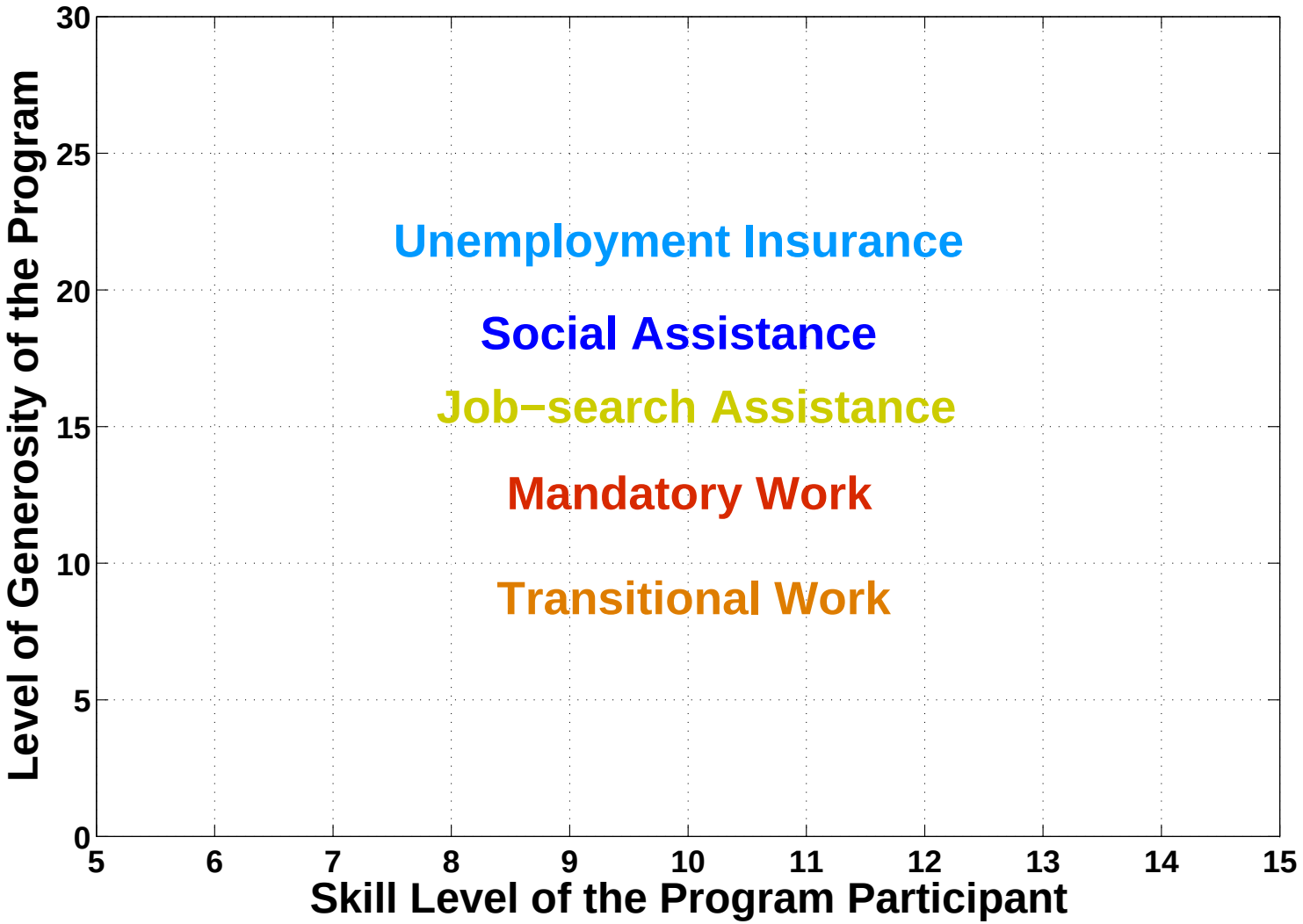

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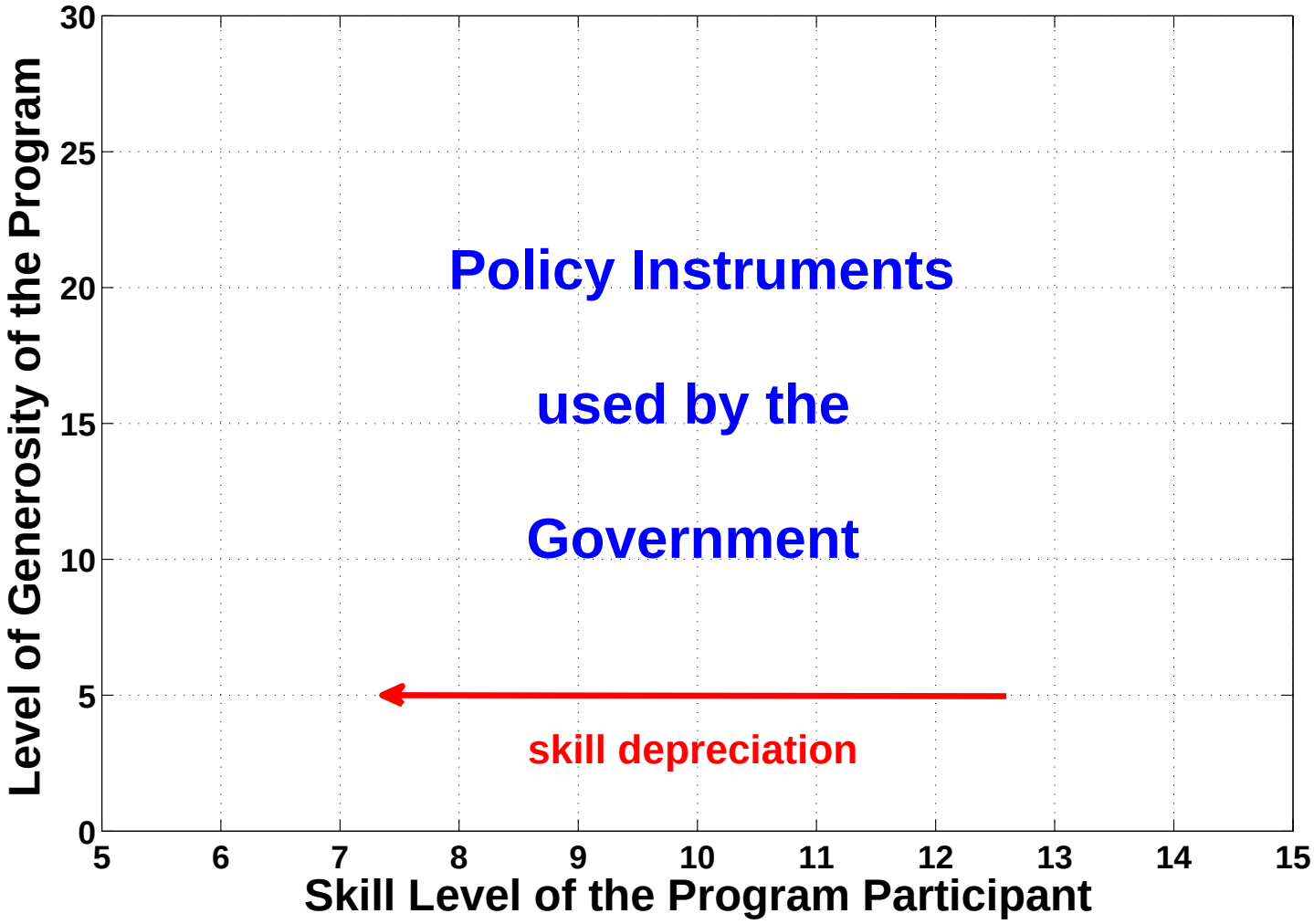

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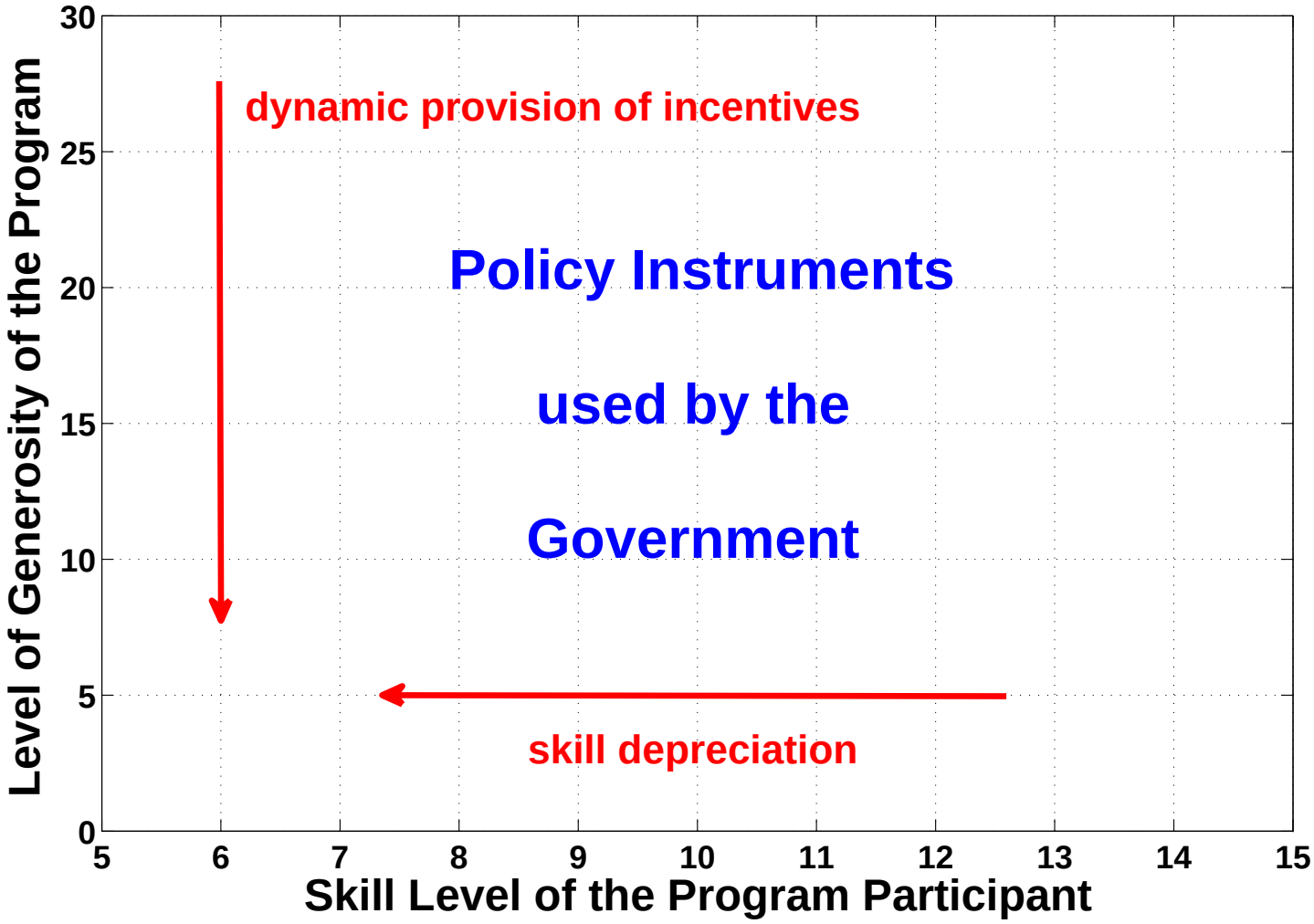

Outline

1. Economic environment
2. Contract between government and unemployed agent
3. Value functions in closed form
4. Characterization of the optimal WTW program
5. How to use the framework for policy evaluation
   (... and another look at the data on US states)

1. Economic Environment

Preferences, endowments, and storage

- Agent is infinitely lived with discount factor $\beta \in (0, 1)$
- Intra-period utility: $u(c, a) = \log(c) - a$
  - Consumption $c \geq 0$ and effort $a \in \{0, e\}$

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- Storage with return $R = \beta^{-1}$

Rest, search, and market-sector job

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- Market-sector job (absorbing state)
  - Requires high effort $(a = e)$ to produce $\omega(h) \geq 0$

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- Search Assistance
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  Interpretation: govt. agency / non-profit org. / community service

Information structure

- Observable and contractible:
  - Agent type h
  - Work effort on market $\&$ make-work jobs (e.g., supervised)
  - Saving $(= 0)$

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  - Agent type h
  - Work effort on market $\&$ make-work jobs (e.g., supervised)
  - Saving $(= 0)$
- Private information of the agent and under her control:
  - Job-search effort [IC-Search]
  - Job offer upon contact [IC-Retention]

2. CONTRACT

Principal-Agent relationship

- Risk neutral principal/government who discounts at rate $R^{-1} = \beta$

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- Recursive formulation with states: (U, h) and employment status
- At every pair (U, h), the contract specifies:
  - Effort level: $a \in \{0, e\}$
  - Activity: assignment to technology
  - Consumption: c, i.e., welfare benefits/wage tax or subsidy
  - Continuation utility: (U^s, U^f) conditional on outcome of search

Options of the contract as policies of WTW program

- Combination of prescriptions on effort a and use of technologies leads to five policy instruments (i):
  - $\mathbf{SA}$: Social Assistance (rest, $a = 0$)
  - $\mathbf{UI}$: Unemployment Insurance (private search, $a = e$)
  - $\mathbf{JA}$: Job-search Assistance (assisted search, $a = 0$)
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- All other feasible options are not optimal

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$$V(U,h) = \max_{i \in \{SA,UI,JA,MW,TW\}} V^i(U,h)$$

Two types of contract

- Long-term contract:
  - $U^s \geq U$ when job-search succeeds (carrot)
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  - No-Stick constraint on continuation utility:

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Bonus I: Immune to hidden saving

Bonus II: Value functions in closed form

3. Value Functions
(all carrot - no stick)

Value functions for all policies

$$V^i(U,h) = \frac{1}{1-\beta} \cdot \left[A^i(h) - B^i(h) \cdot \exp((1-\beta)U)\right]$$

- $A^i(h)$: output net of administrative cost (κ^A, κ^P)
- $B^i(h)$: cost of promising a unit of U in c terms

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  - Mandatory Work (MW)

$$\begin{aligned} V^{MW}(U) &= \max_c \ \underline{\omega} - \kappa^P - c + \beta V^{MW}(U) \\ \text{s.t.} &: \\ U &= \log(c) - e + \beta U \qquad (PK) \end{aligned}$$

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Returns and costs of each policy

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$A^i(h)$: return net of administrative cost

MW:	$\underline{\omega} - \kappa^P$
SA:	0
UI:	$\frac{\beta\pi(h)}{1-\beta+\beta\pi(h)}\omega(h)$
JA:	$\frac{\beta\pi(h)}{1-\beta+\beta\pi(h)}\omega(h) - \frac{1-\beta}{\beta\pi(h)}\kappa^A$
TW:	$\frac{\beta\pi(h)}{1-\beta+\beta\pi(h)}\omega(h) + \frac{1-\beta}{\beta\pi(h)}\left(\underline{\omega} - \kappa^P - \kappa^A\right)$

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$B^i(h)$: cost of promising U in c terms

MW:	$\exp(e)$
SA:	1
UI:	$\exp(e) \times$ cost of [IC-S]
JA:	$\frac{\beta\pi(h)}{1-\beta+\beta\pi(h)} \exp(e) \times$ cost of [IC-R]
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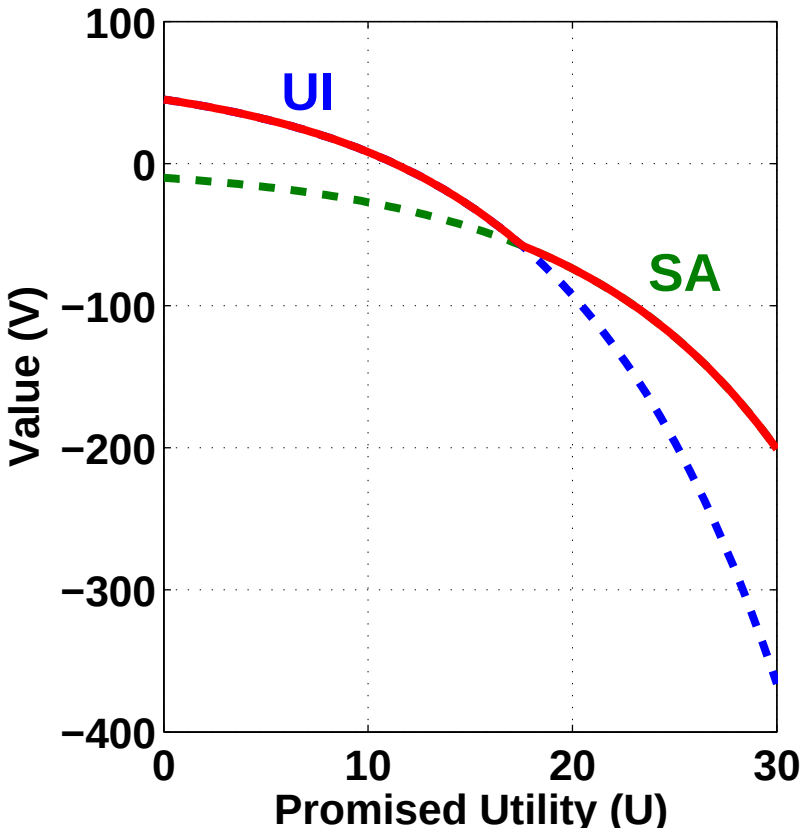

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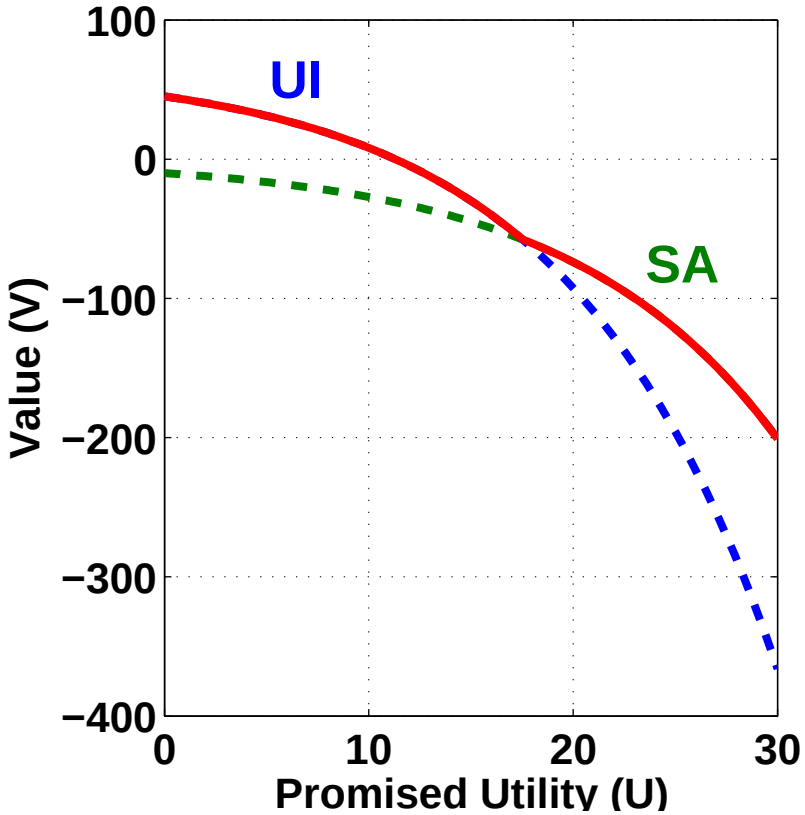
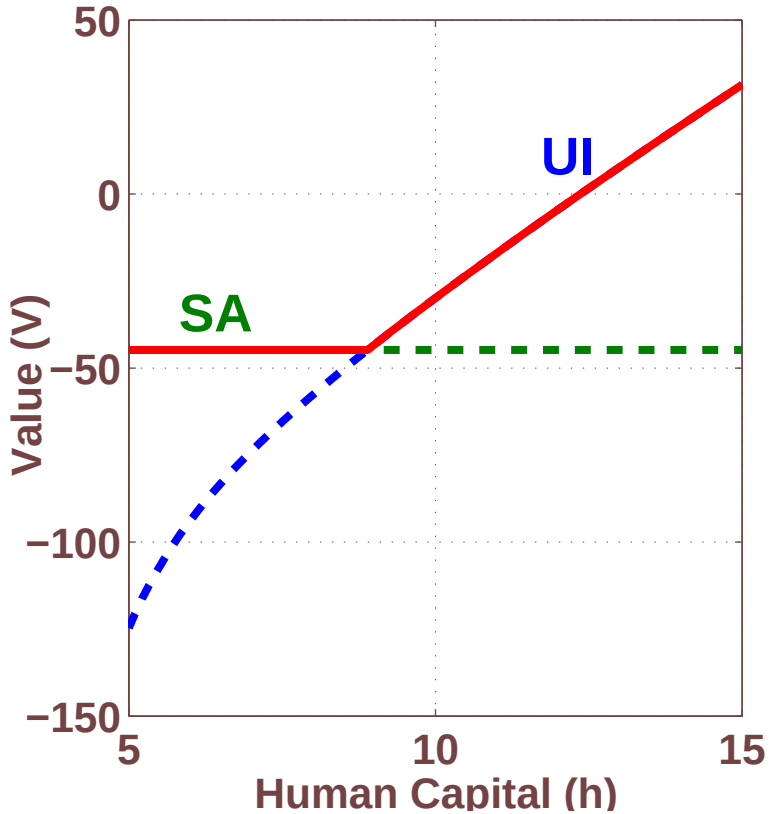
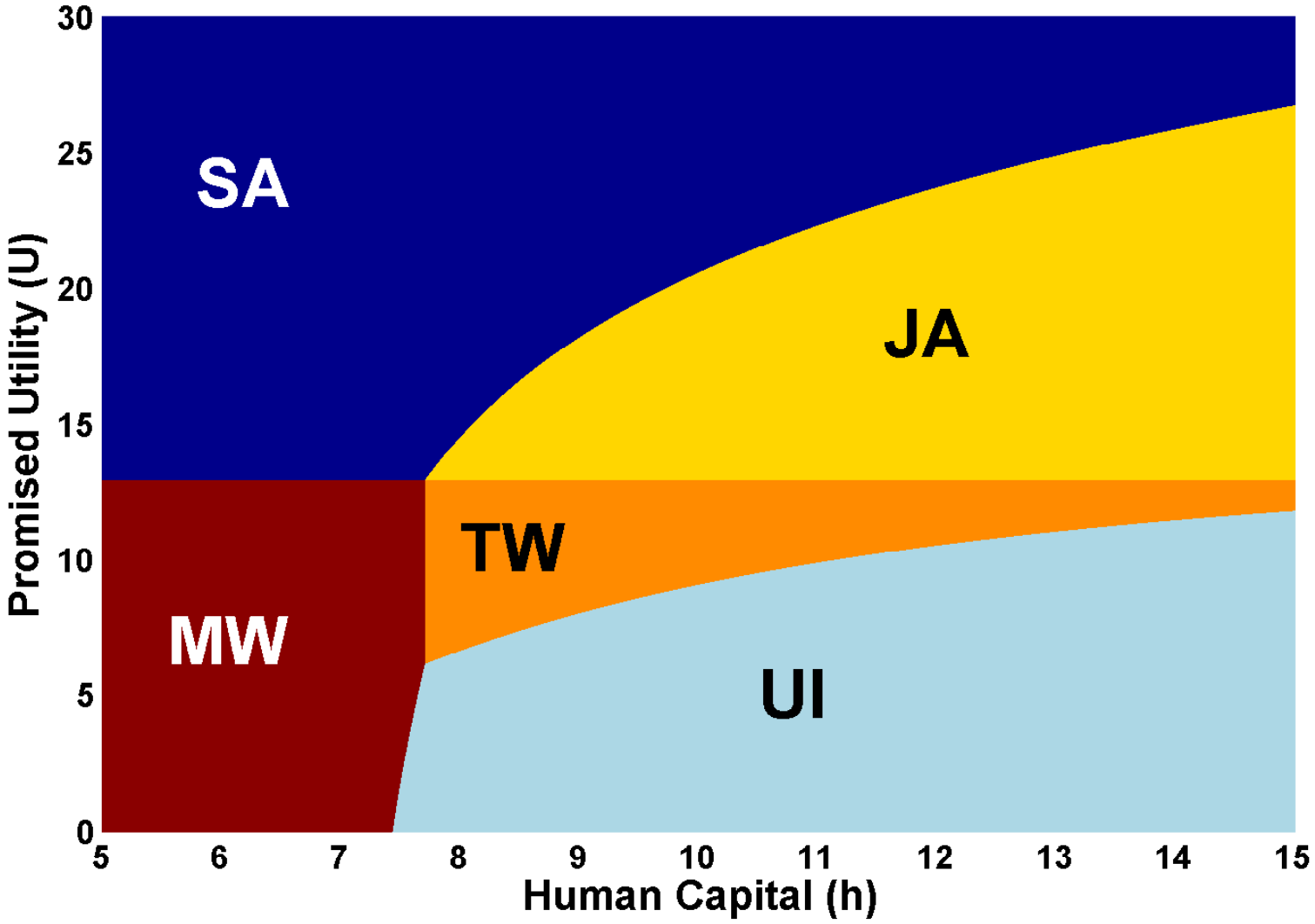


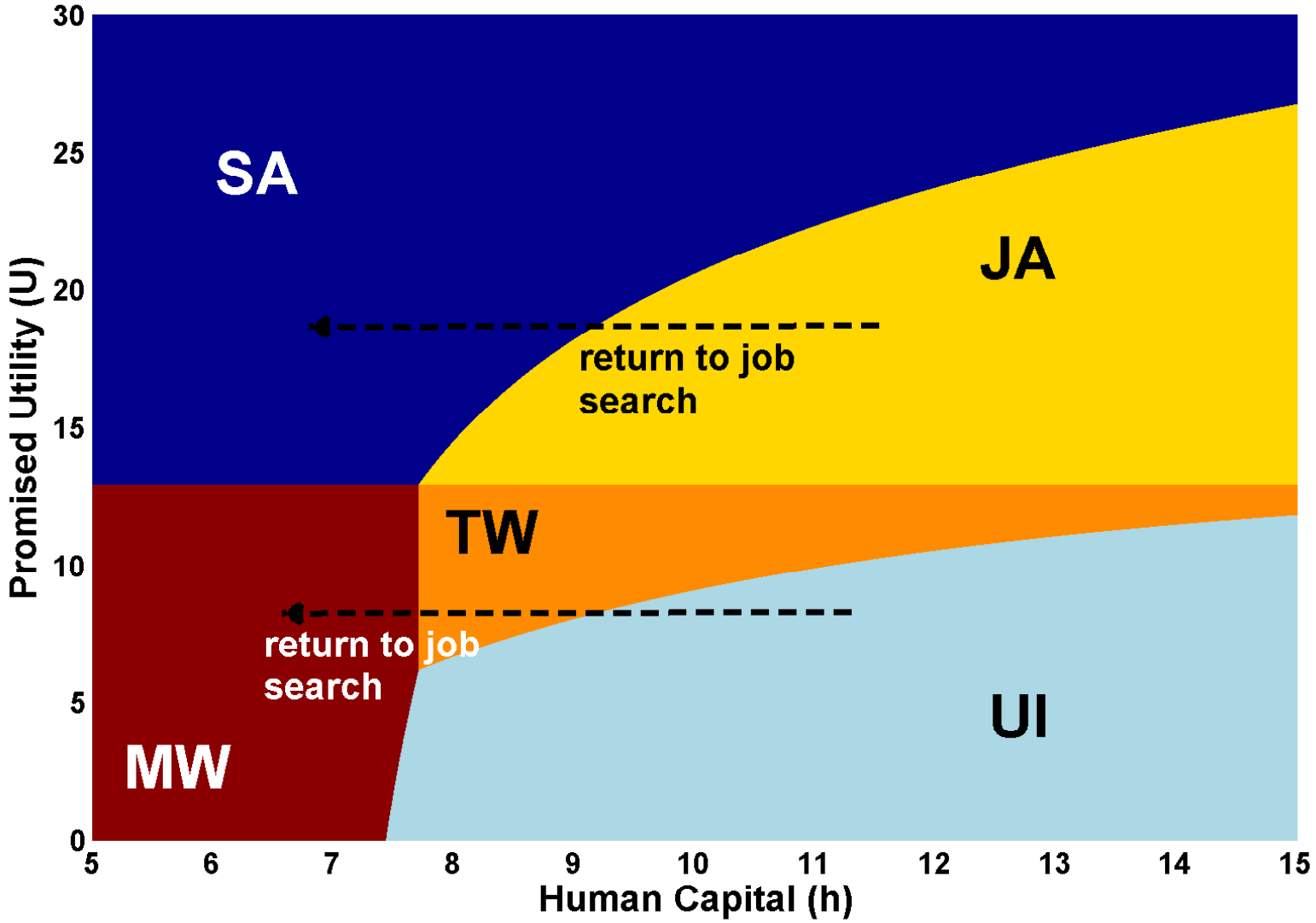


4. Optimal WTW Program (h fixed - U fixed)

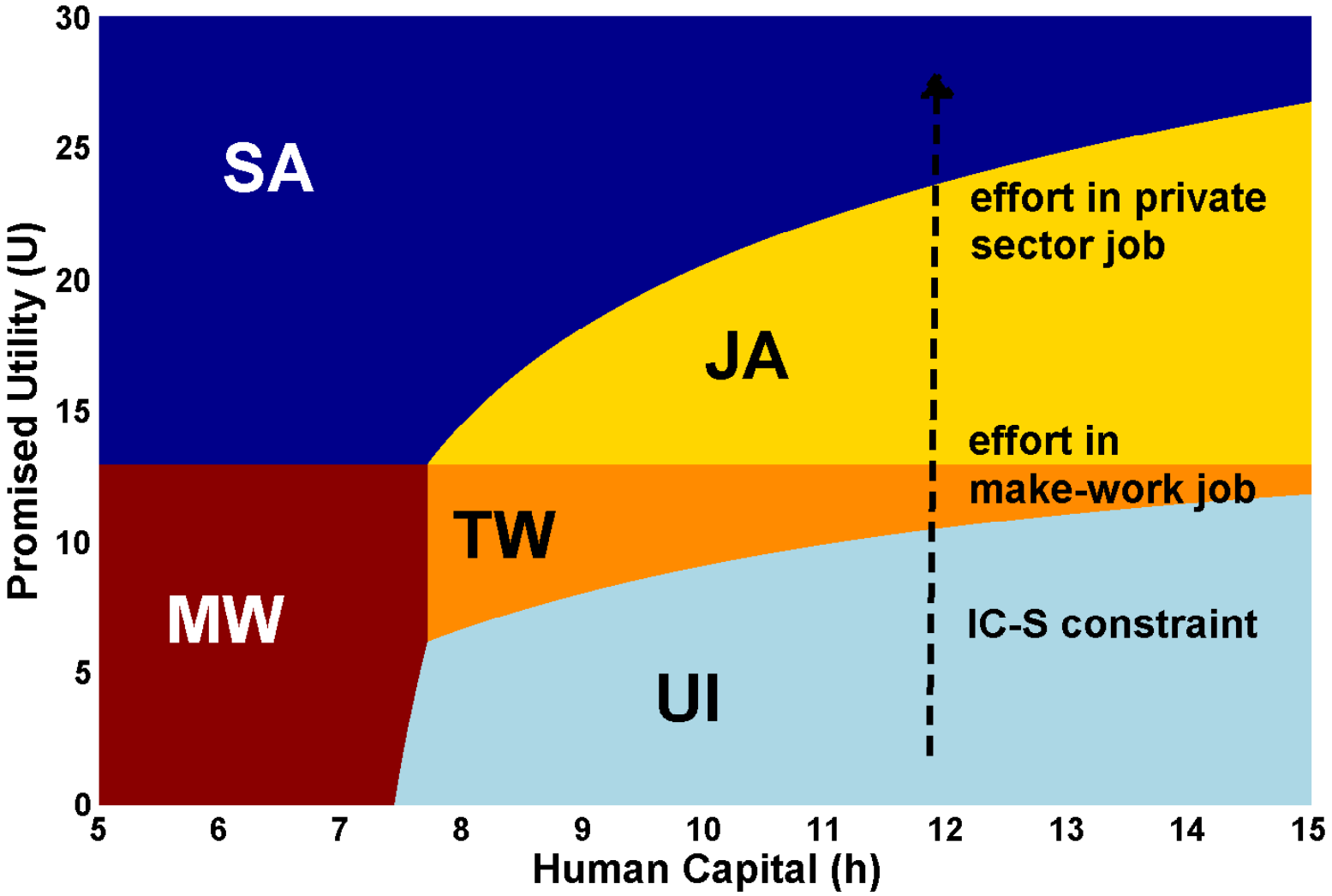
Optimal WTW program



Comparative statics wrt h



Comparative statics wrt U



Comparative statics wrt labor market conditions (π, ω)

Tight Labor Market
(π, ω) **high**

Slack Labor Market
(π, ω) **low**

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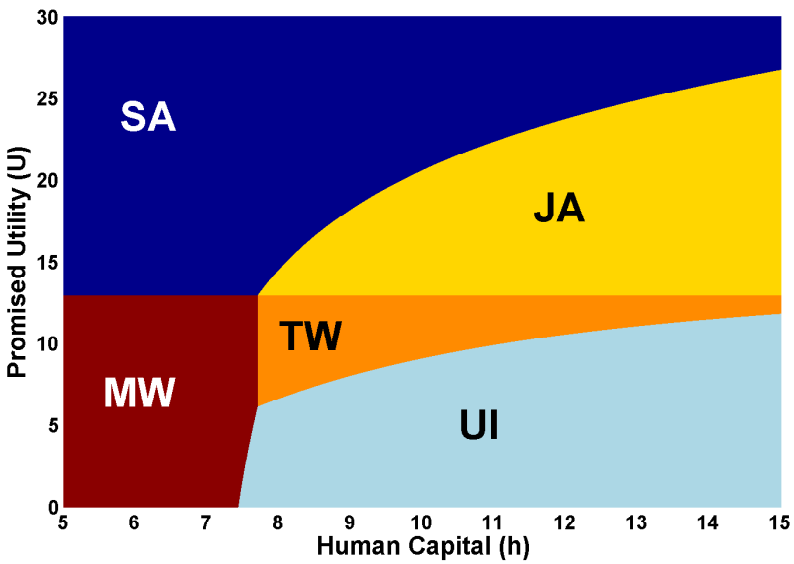

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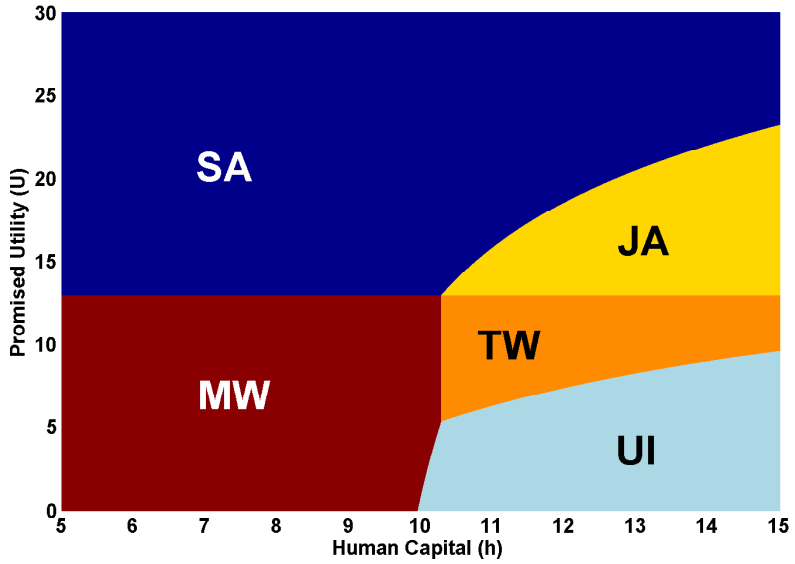

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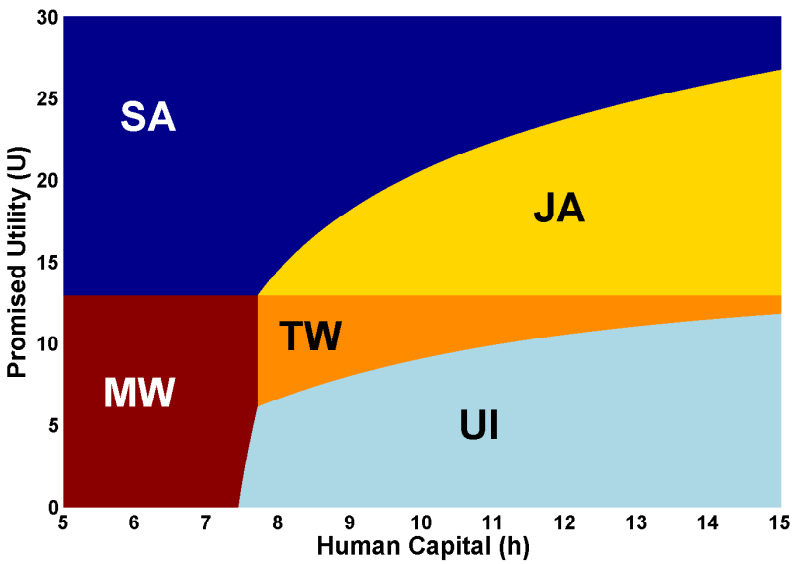

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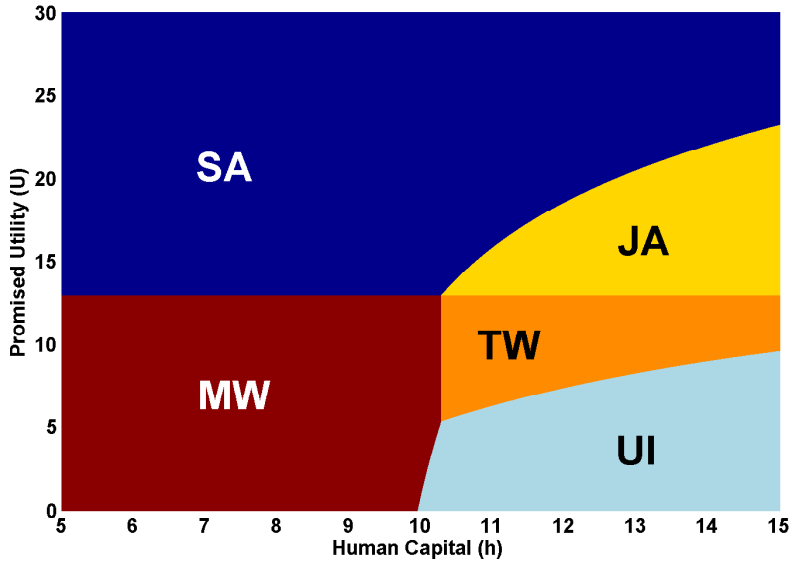

- Recession: more SA, but also larger gap $U^s - U = \frac{e}{\beta\pi(h)}$ in UI
- Policy transitions as labor market conditions change

Comparative statics wrt effort cost e

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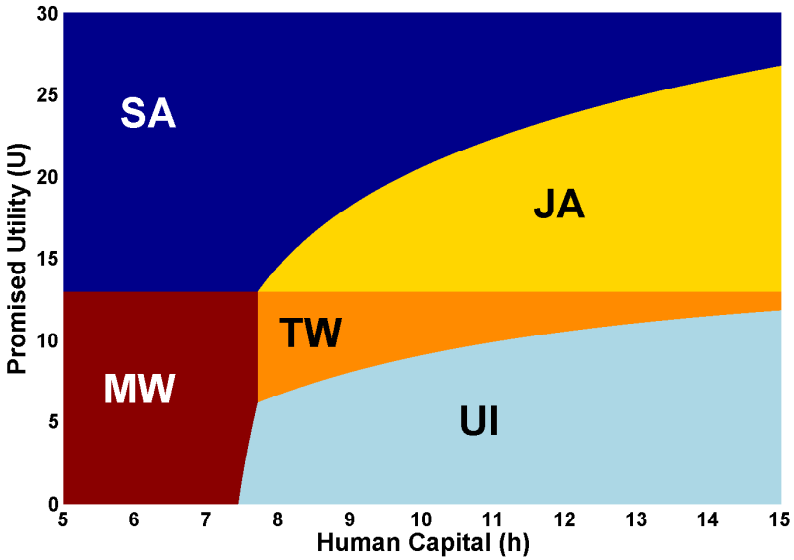

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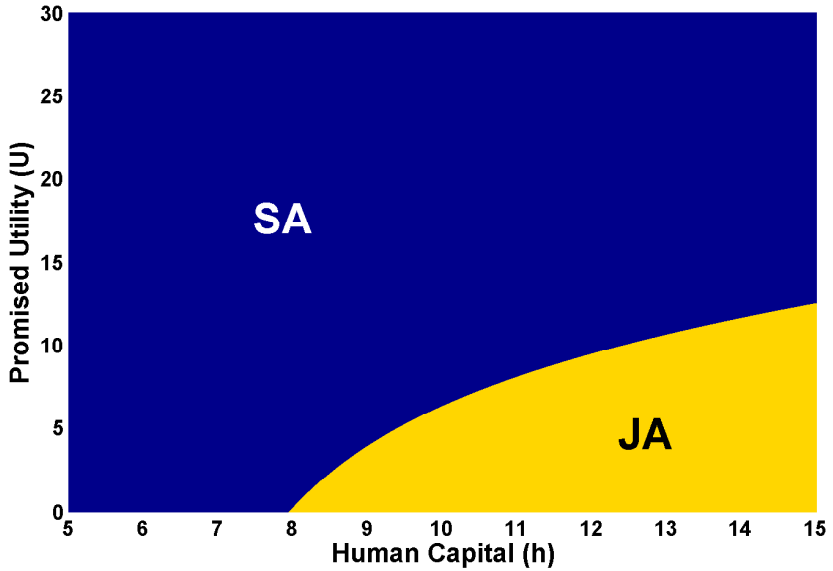

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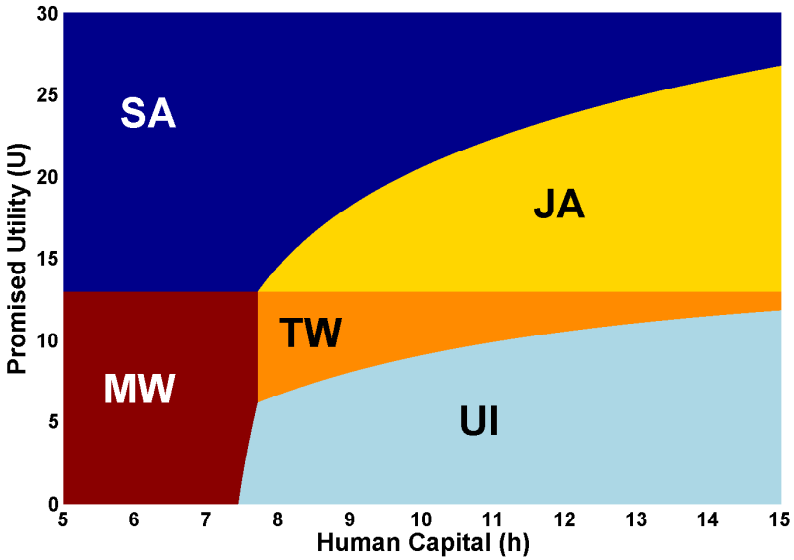

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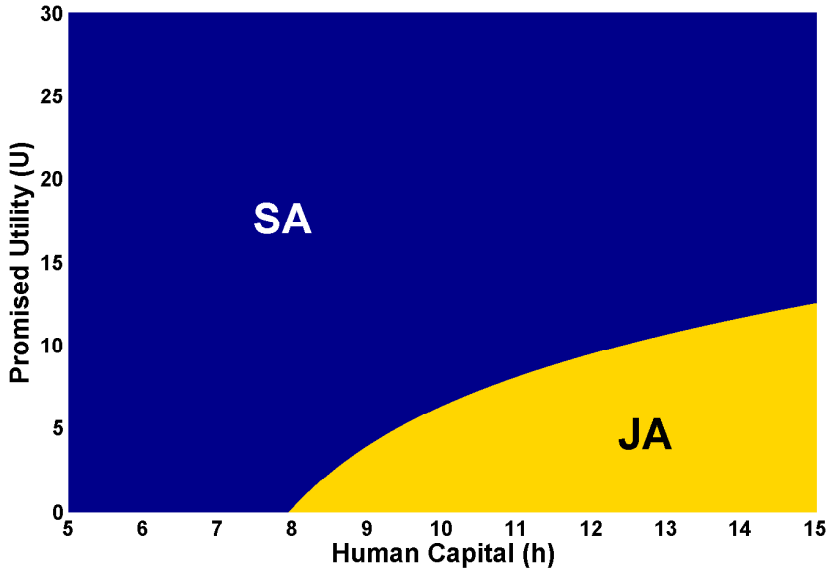

- High effort demographic groups (e.g., single parents, disabled): more use of JA & SA

5. Human Capital Depreciation (h moving - U fixed)

Two implications of h depreciation

1. Wage depreciation (ω)

2. Duration dependence in job-finding rate (π)

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   - Earnings losses upon displacement...
     - Jacobson-Lalonde-Sullivan (1993); Ljungqvist-Sargent (1998)
   - ... increase in the duration of the unemployment spell
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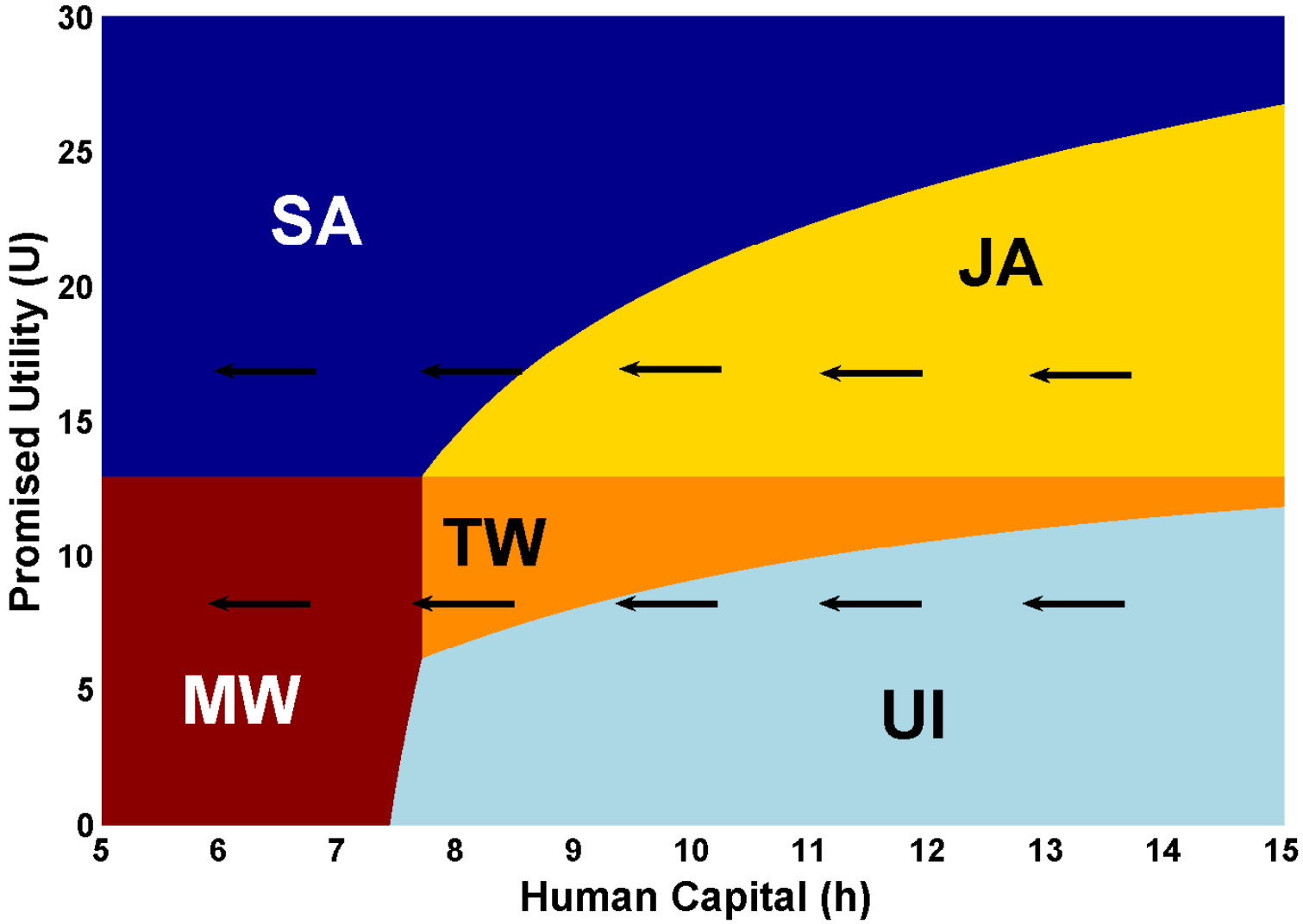
Key feature of WTW program: transitions across policies

Optimal WTW program with h depreciation



Summary of policy transitions induced by h dynamics

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- ... unless MW increases "work experience" (and $h \uparrow$)

6. Dynamic Incentives
(h fixed - U moving)

Dynamic incentives (carrot $\&$ stick)

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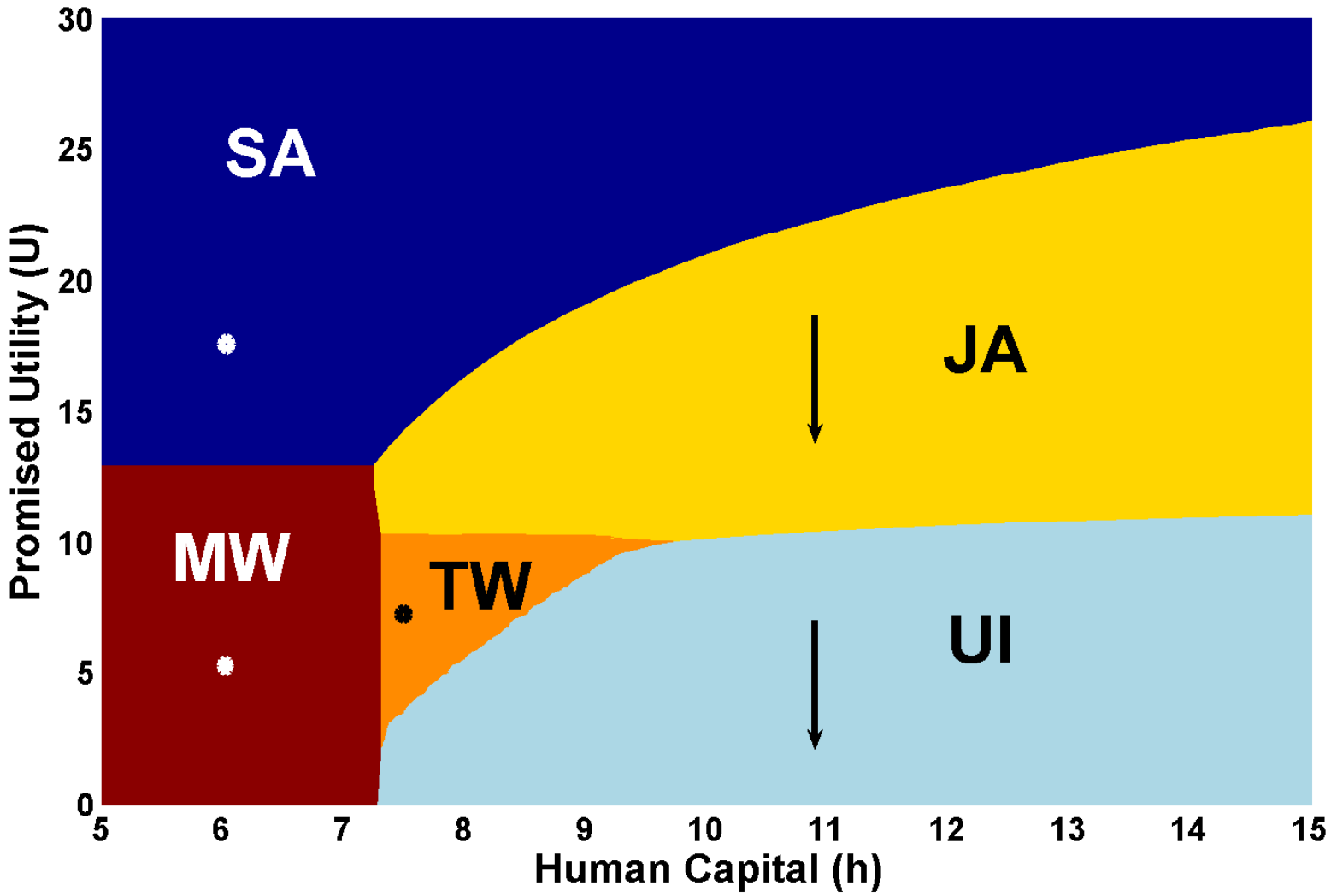
- U allowed to change during unemployment spell
  - Never rises
  - Falls in policies with IC binding: UI and JA
- Some new policy transitions only due to dynamic incentives

Optimal WTW program with dynamic incentives



7. Value of additional policies (beyond UI & SA)

Mandatory work as effective threat in WTW programs

- Dynamic incentives and human capital depreciation
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Mandatory work as effective threat in WTW programs

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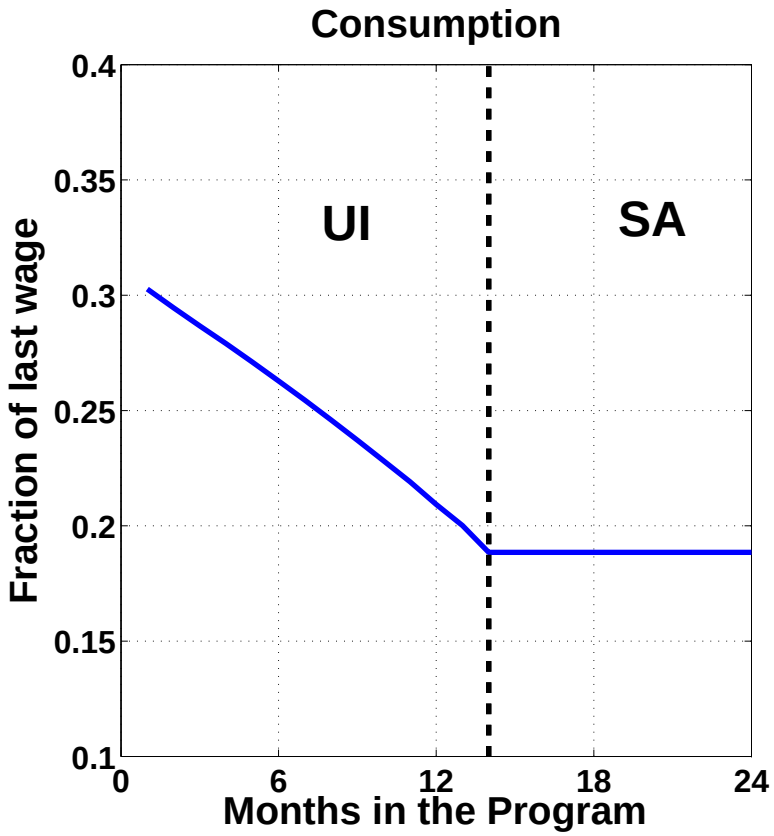
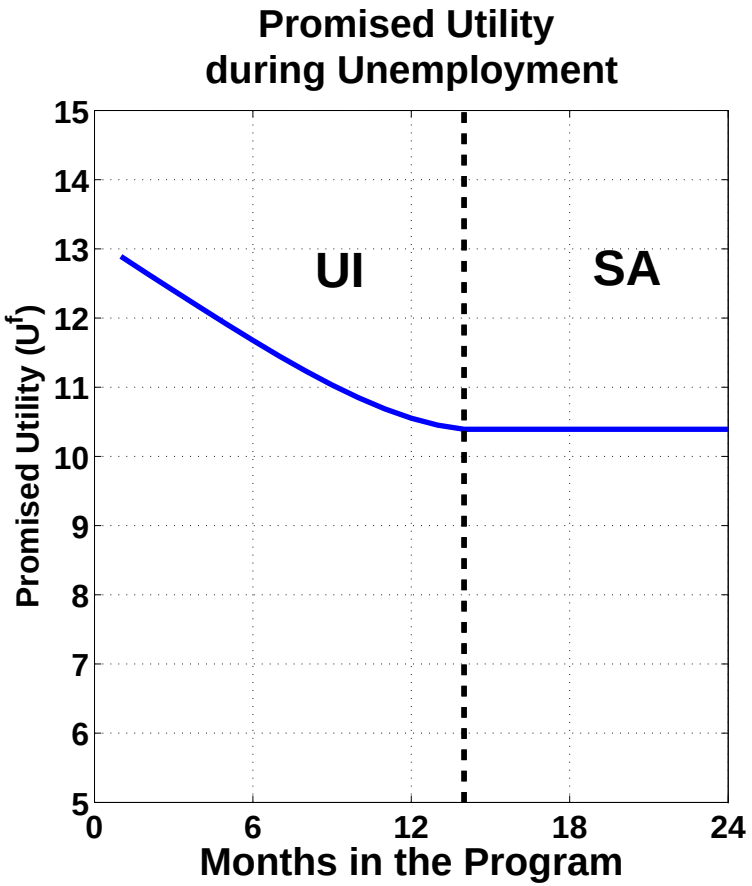
- Comparison of two WTW programs with same (U_0, h_0):
  1. $UI \rightarrow SA$
     - Punishment (fall in U) obtained by decreasing benefits
  2. $UI \rightarrow MW$
     - Punishment (fall in U) through threat of future work effort
     - Better intertemporal consumption smoothing

Example





$$U_t = \log(c_t) - e_t + \beta \mathbb{E}_t[U_{t+1}] \qquad (PK)$$

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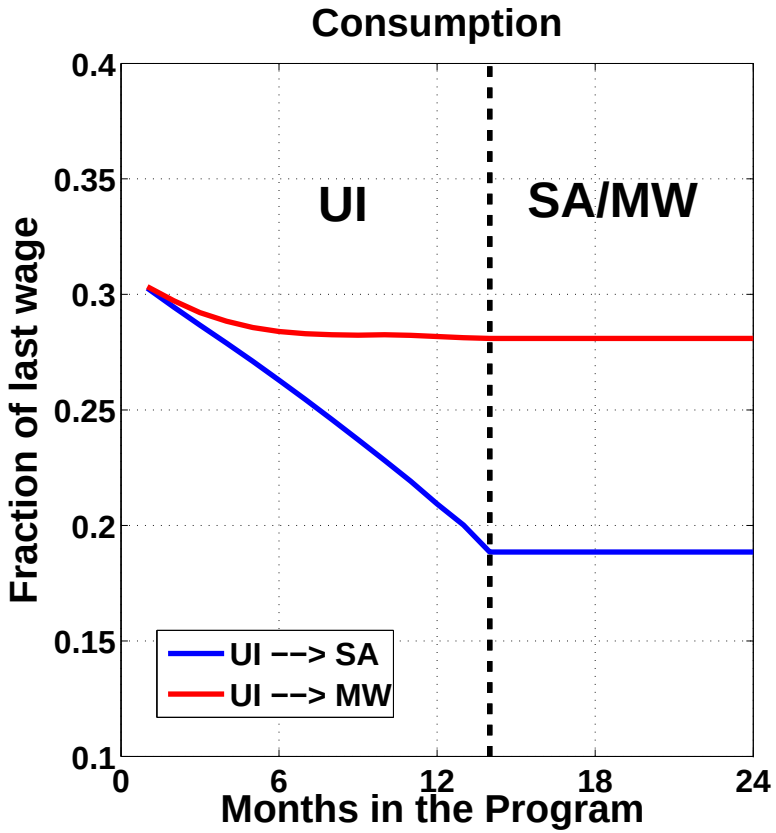

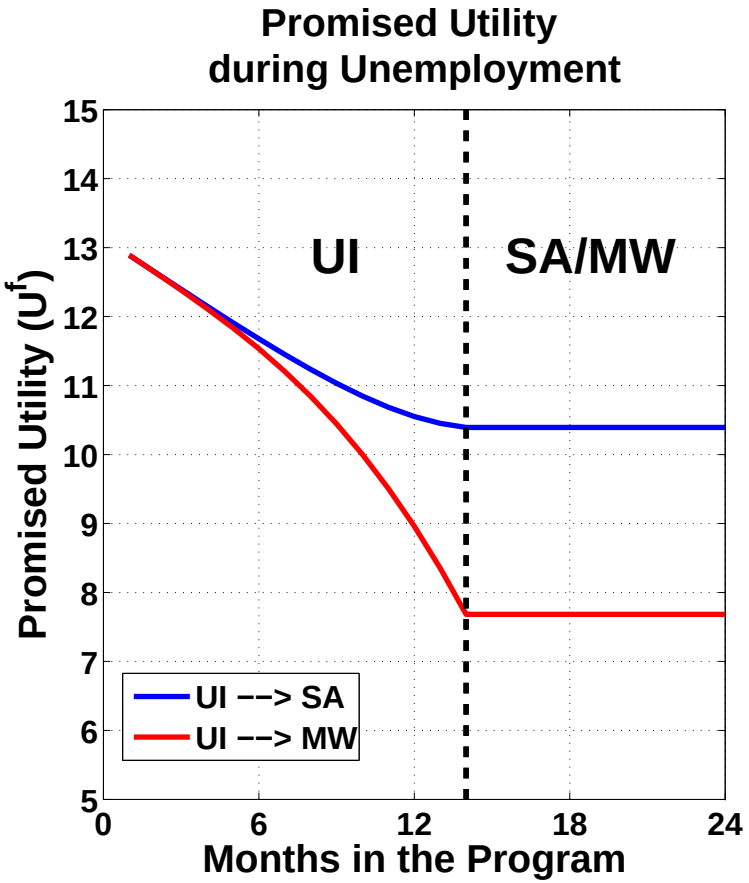

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Heterogeneity in design of WTW programs $\Rightarrow$ framework needed

Determinants of the optimal (sequence of) policy instruments:

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Heterogeneity in design of WTW programs $\Rightarrow$ framework needed

Determinants of the optimal (sequence of) policy instruments:

1. Initial budget / ex-ante generosity of the program
2. Skill distribution of the labor force
3. Effort cost of participants (e.g., household type)
4. Labor market conditions
5. Degree of skill depreciation (e.g., occupation, age)
6. Dynamic provision of incentives (e.g., policies with private info?)

8. Next step on the Agenda: policy evaluation

Policy Evaluation

Quantify cost saving of switching from actual to optimal program

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3. Expected cost (K_0^*) of optimal WTW program starting from U_0

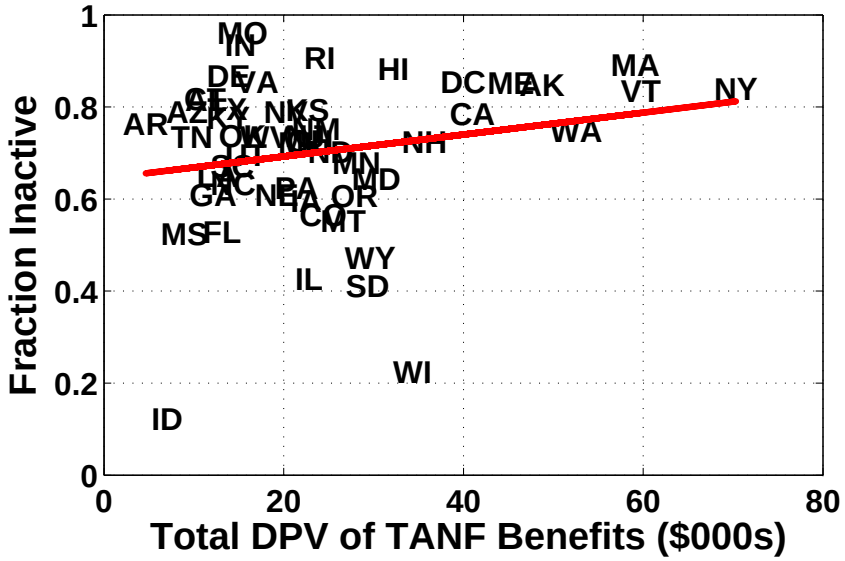
An exploratory look at the data on U.S. states

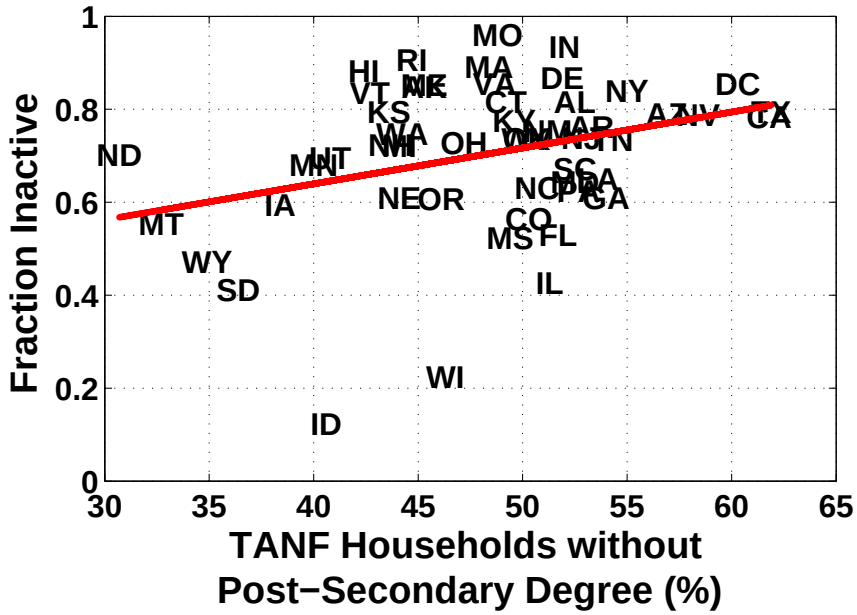
Prescription of the theory: more inactivity (SA) in states with:

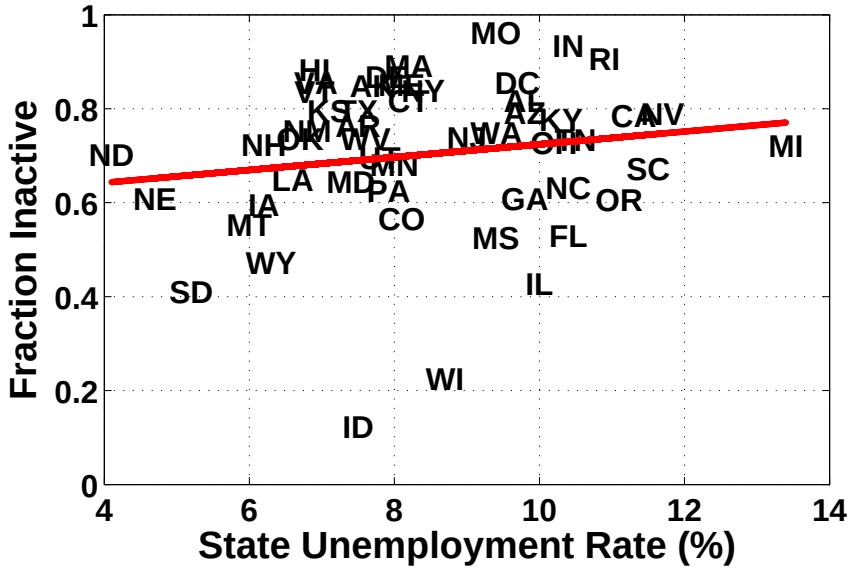
An exploratory look at the data on U.S. states

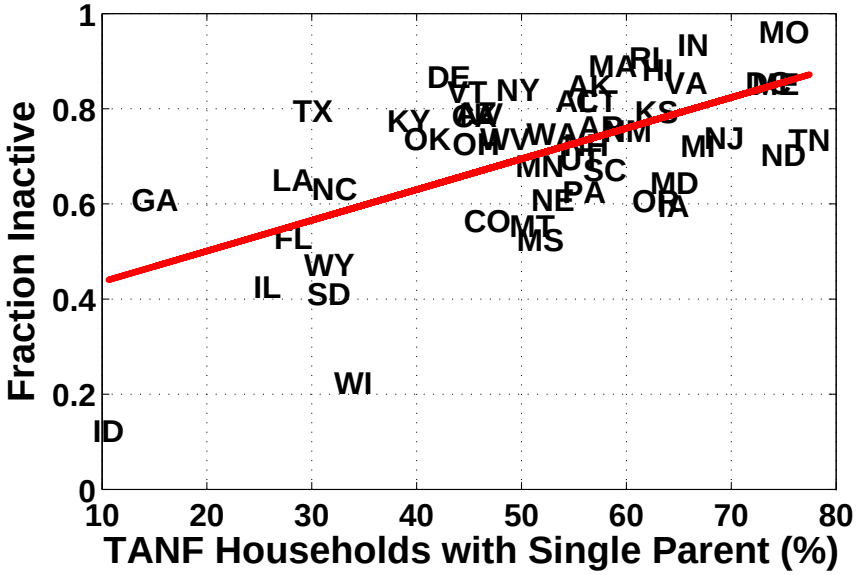
Prescription of the theory: more inactivity (SA) in states with:

1. Higher generosity of TANF benefits $\rightarrow$ high U
2. Less skilled labor force $\rightarrow$ low h
3. Higher unemployment rate $\rightarrow$ low π
4. More single-parent households with small children $\rightarrow$ high e


Fraction Inactive
Total DPV of TANF Benefits ($000s)
0
20
40
60
80
0.2
0.4
0.6
0.8
1
MO
IN
RI
HI
DE
VA
DC
MA
AK
VT
NY
CA
WA
NH
MD
WY
SD
WI
ID
MS
FL
IL
MT
OR
GA


Fraction Inactive
TANF Households without
Post−Secondary Degree (%)
30
35
40
45
50
55
60
65
0.2
0.4
0.6
0.8
1
MO
IN
RI
MA
DE
NY
DC
AL
CA
ND
MT
IA
NE
OR
WY
SD
MS
FL
IL
WI
ID


Fraction Inactive
State Unemployment Rate (%)
4
6
8
10
12
14
0.2
0.4
0.6
0.8
1
MO
IN
RI
DC
CA
NV
ND
NE
LA
MD
PA
NC
OR
SC
MI
IA
MT
CO
GA
MS
FL
WY
SD
IL
WI
ID


Fraction Inactive
TANF Households with Single Parent (%)
10
20
30
40
50
60
70
80
0.2
0.4
0.6
0.8
1
MO
IN
RI
MA
HI
VA
DE
NY
TX
KY
OK
NJ
TN
ND
LA
NC
MD
GA
PA
OR
IA
CO
MT
MS
FL
WY
IL
SD
WI
ID

THANK YOU !