

Optimal Welfare-to-Work Programs

Nicola Pavoni, Giovanni L. Violante

2005

20 min presentation for Sargent's RG

02/21/06

Workers

- Preference: $u(c) - a$ ($u' > 0, u'' < 0$)
- During employment
 - produce output $\omega(h)$ every period
 - human capital accumulates
- Activities during unemployment
 - search \ training
 - effort $a \in \{0, e\}$
 - outcome of search and training is stochastic
 - human capital accumulates (depreciates) if search training is successful (unsuccessful)
- unemployment hazard rate $\pi(h, a) \in (0, 1)$ and $\pi(h, 0) = 0$
- no self-insurance

Planner

- risk-neutral
- offers the unemployed worker a contract that maximizes the expected discounted stream of net revenues and guarantees the agent an expected discounted utility level
- observes the employment status, whether the unemployed worker is searching or training and the outcome of the training
- can't observe workers' efforts
- at time t the contract specifies
 - *transfers* of resources to the worker
 - *recommendations* on search vs. training activities and on the search/training *effort level* to exert
 - the choice of using the *effort-monitoring technology*
- can use "randomizations" in the contract

Policy components in contract

During unemployment status

- UI (unemployment insurance): search + high effort
- SA (social assistance): search + no effort
- TR (training): training + high effort
- JM (job-search monitoring): monitoring + high effort

During employment status

- wage tax \ subsidy

Recursive formulation of the planner's problem

$$V(U, h) = \max_{i \in \{JM, SA, TR, UI\}} V^i(U, h)$$

The value function for the planner solves

$$V(U, h) = \int_0^1 \max_{U(x) \in D} V(U(x), h) dx$$

$$s.t \quad U = \int_0^1 U(x) dx$$

Polices

Unemployment Insurance (UI):

$$V^{UI}(U, h) = \max_{c, U^f, U^s} -c + \beta[\pi(h)W(U^s, h^s) + (1 - \pi(h))\mathbf{V}(U^f, h^f)]$$

$$s.t \quad U = u(c) - e + \beta[\pi(h)U^s + (1 - \pi(h))U^f]$$

$$U \geq u(c) + \beta U^f$$

$$h^s = Ah^\alpha + (1 - \delta)h, \quad h^f = (1 - \delta)h$$

Training (TR):

$$V^{TR}(U, h) = \max_{c, U^s, U^f} -c - \kappa^{TR} + \beta[\theta\mathbf{V}(U^s, h^s) + (1 - \theta)\mathbf{V}(U^f, h^f)]$$

$$s.t \quad U = u(c) - e + \beta[\theta U^s + (1 - \theta)U^f]$$

$$U \geq u(c) + \beta U^f$$

Polices (continuing)

Job Search Monitoring (JM):

$$V^{JM}(U, h) = \max_{c, U^f, U^s} -c - \kappa^{JM} + \beta[\pi(h)W(U^s, h^f) + (1 - \pi(h))\mathbf{V}(U^f, h^f)]$$
$$s.t \quad U = u(c) - e + \beta[\pi(h)U^s + (1 - \pi(h))U^f]$$

Social Assistance (SA):

$$V^{SA}(U, h) = \max_{c, U^f} -c + \beta\mathbf{V}(U^f, h^f)$$
$$s.t \quad U = u(c) + \beta U^f$$

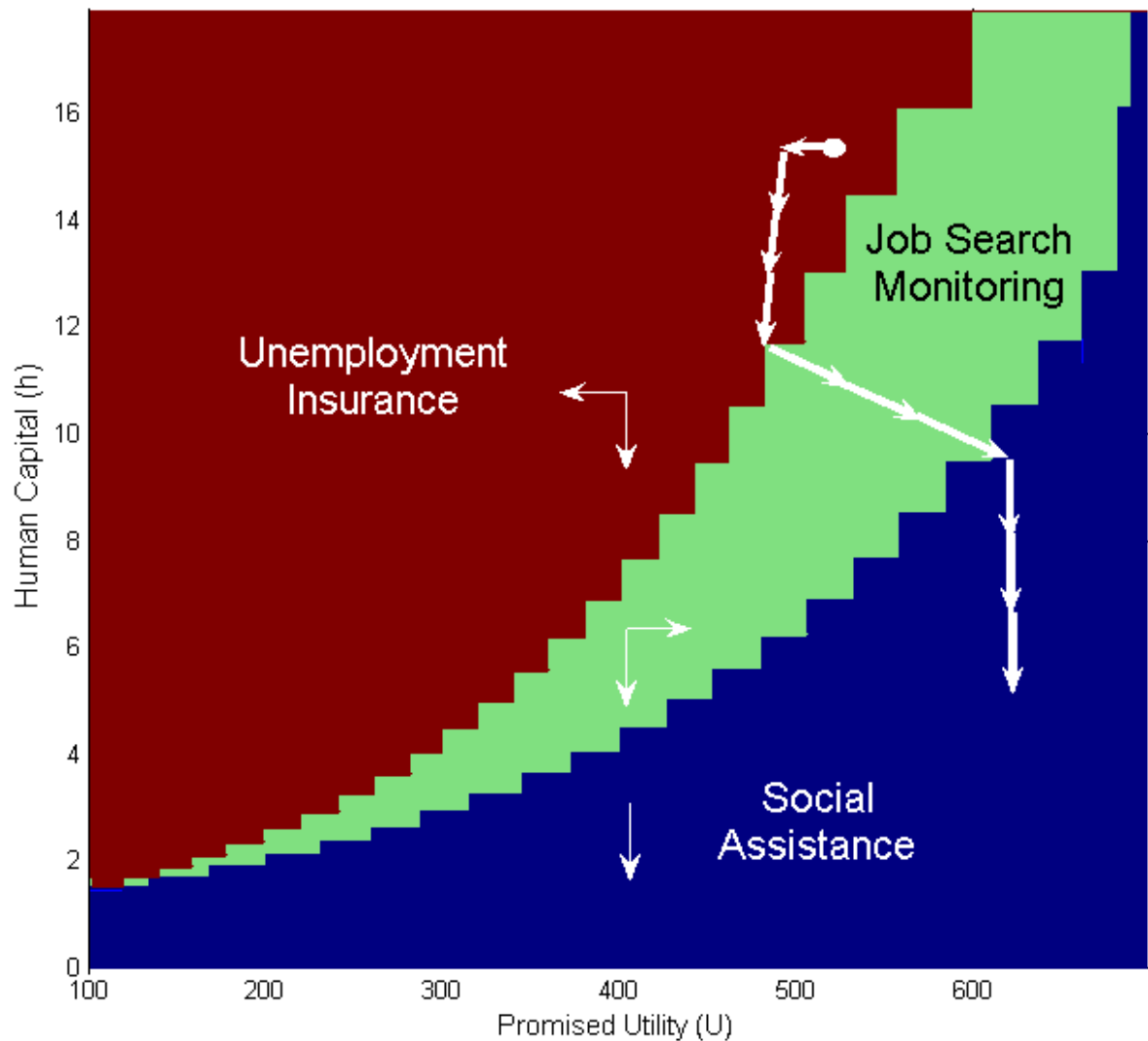
Employment state:

$$W(U, h) = \max_{c, U^s} \omega(h) - c + \beta W(U^s, h^s)$$
$$s.t \quad U = u(c) + \beta U^s$$

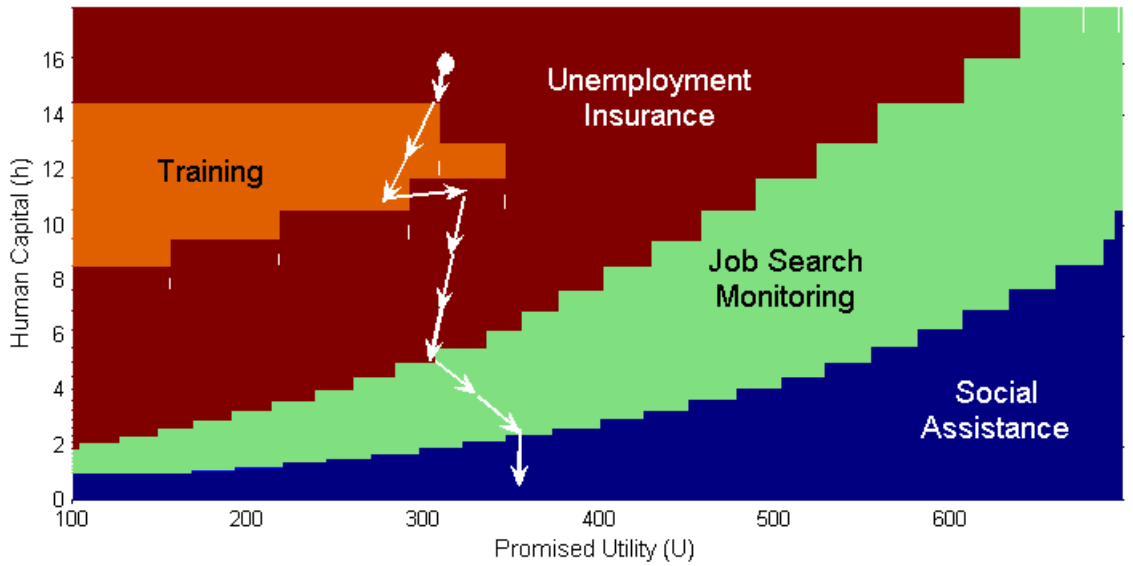
Main Qualitative Results

- SA is an absorbing policy. That is, if it is chosen at any period t , choosing it thereafter is optimal.
- If $\pi(\cdot)$ and $\omega(\cdot)$ do not depend on h ; every policy (JM, SA, UI) is absorbing.
- (Optimal Policy Sequence) Without training, (under some conditions) if at some period t the optimal program selects JM; then next period it is always optimal to either repeat JM or switch to SA. In particular, an optimal WTW program never switches from JM into UI.

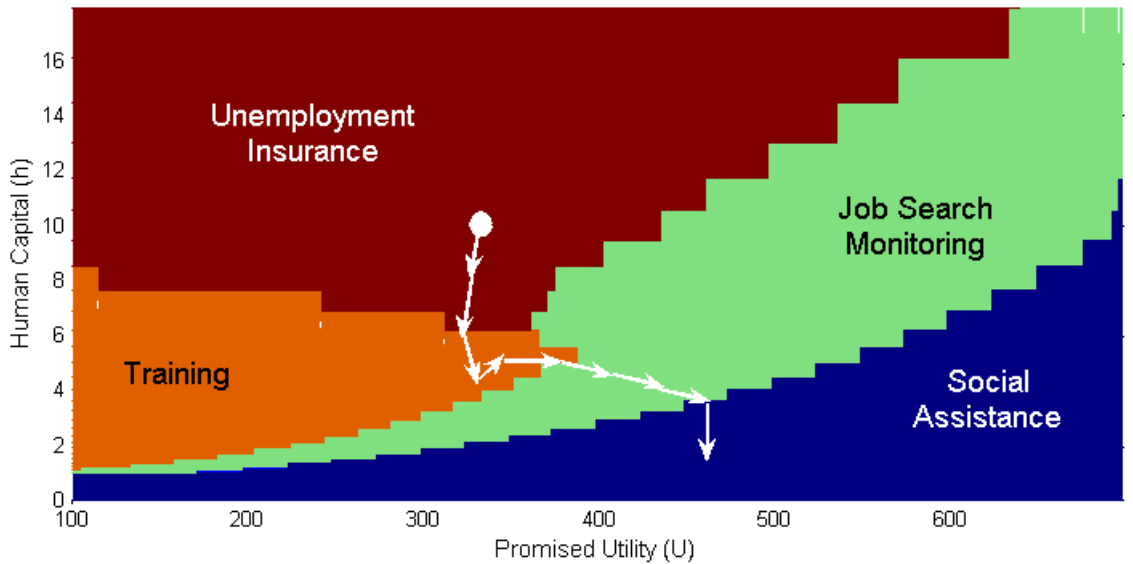
Optimal Policies in the (U,h) Space without Training



Optimal Policies in the (U,h) Space with Training



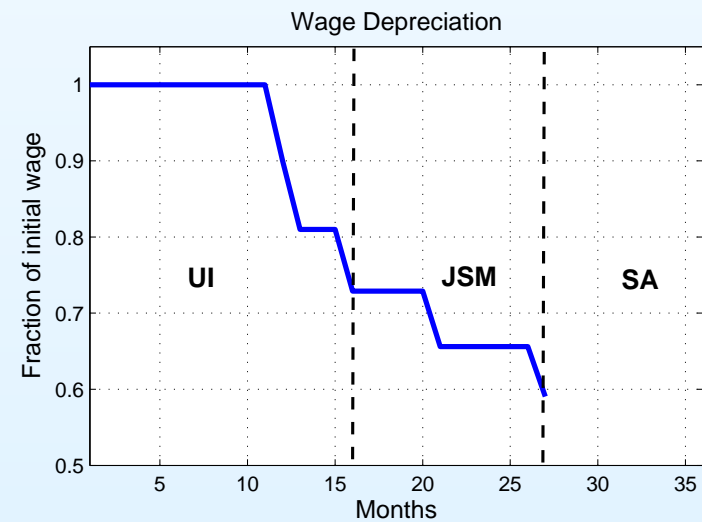
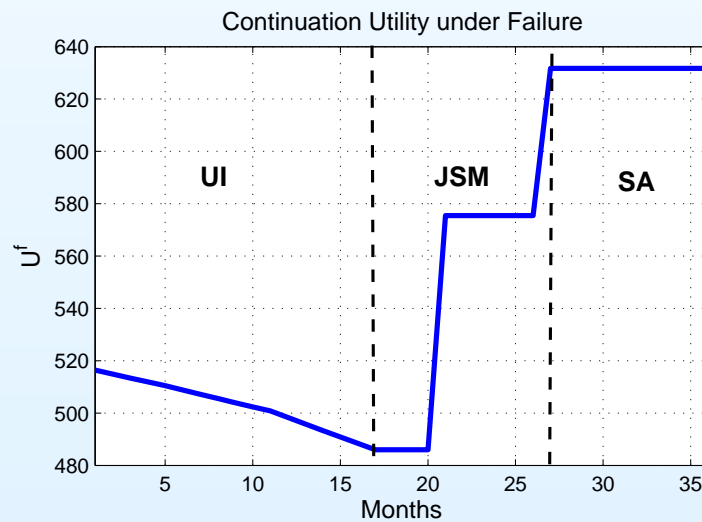
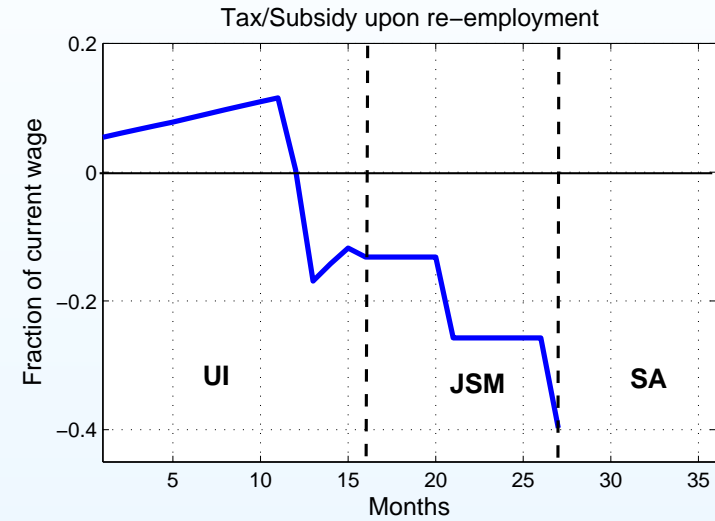
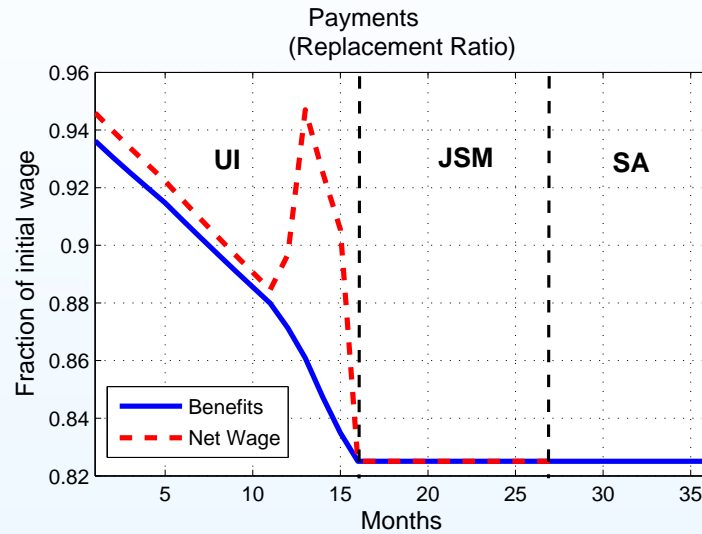
Optimal Policies in the (U,h) Space with Training



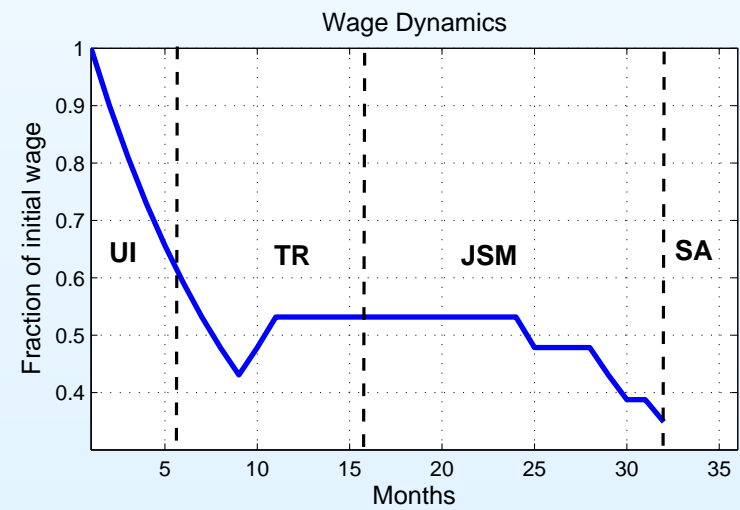
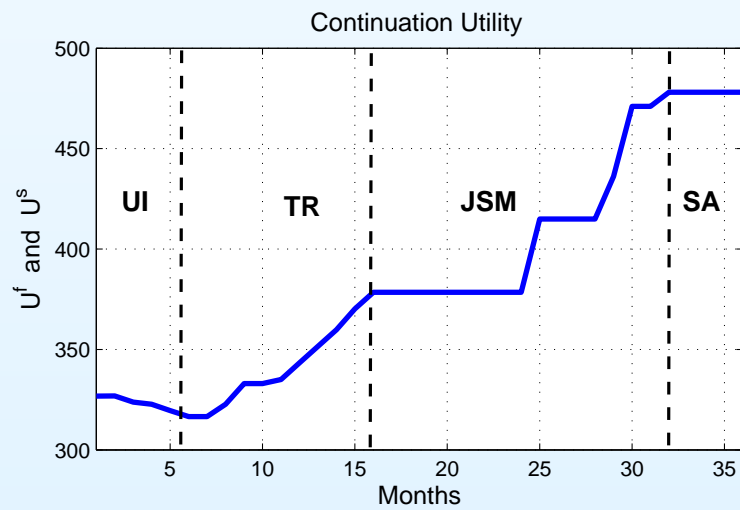
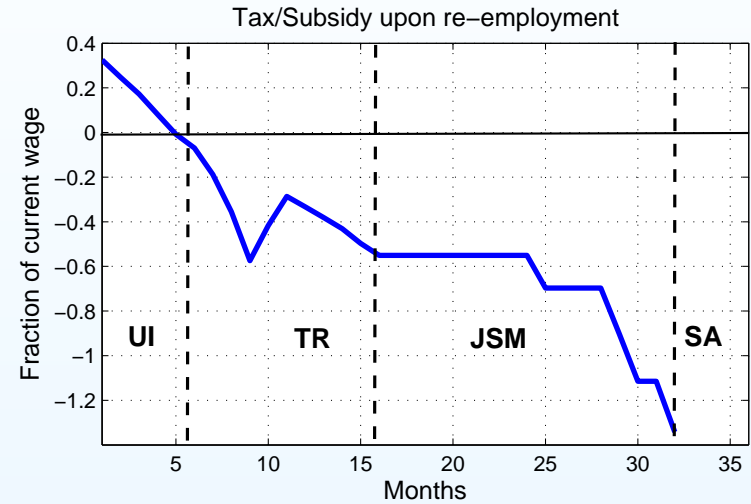
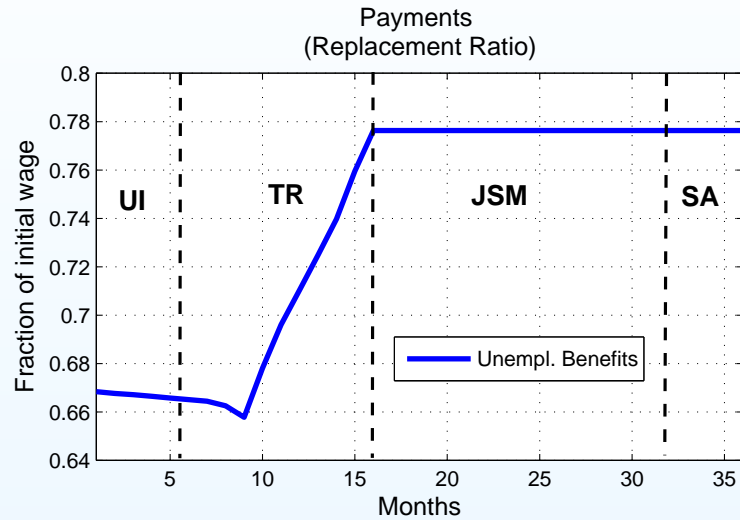
Qualitative Results (continuing)

- Payments (without training):
 - during unemployment insurance (UI), benefits are decreasing;
 - during job search monitoring (JM), the benefits are constant and the wage tax (subsidy) is decreasing (increasing)
 - during social assistance (SA) benefits are constant
 - if π and ω do not depend on h (fixed human capital case), during UI the wage tax is increasing over time, and during JM both the benefits and the wage tax/subsidy are constant

A Typical History without Training



A Typical History with Training



Simulation Result

