WELFARE EFFECTS OF SHORT-TIME COMPENSATION

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Short-Time Compensation (STC): Welfare Questions

- Does introducing STC improve on UI?
- If so, how to combine STC and UI optimally?
- Through what mechanism does STC affect welfare?
- What features of the environment (preferences, technology, private insurance) determine the desirability of STC?

Minimal Ingredients

- Risk averse workers
- Intensive margin (hours per worker can vary)
- Limited access to private insurance

Starting Point: Burdett and Wright (1989)

Key Features

- Static model of a firm with risk averse workers attached to it
- Risk-averse employer
- Firm-specific shocks to profitability
- Firm can respond on intensive and extensive margin

Main Results

- UI induces excessive layoffs (as in Feldstein (1976))
- STC induces inefficiently low hours

Discussion of Policy Implication

recommend neutralizing UI and STC via experience rating

This Paper

- build on Burdett and Wright (1989)
- analyze welfare effects of STC and optimal policy
- key trade-off: labor-input distortions vs. insurance
- trade-off well understood for UI
- question: how does STC enter this trade-off?
    - insurance channel
    - labor-distortions channel

This Paper: Main Results

Identify key determinant of optimality of STC

How well are firms already insured against “temporary” shocks in the absence of public insurance?

Temporary Shocks Insured

- UI induces excessive layoffs in response to adverse shocks
- STC mitigates this distortion
- STC has no direct insurance role, but indirectly yields better insurance by raising optimal UI

Temporary Shocks Uninsured

- distressed firms choose high hours, foregoing STC
- direct insurance effect is negative
- STC cannot mitigate the excessive layoffs in these firms

ENVIRONMENT: TECHNOLOGY

- firm with mass $N = 1$ workers attached to it
- production function:

$$xf(nh) - nF$$

n fraction of workers working positive hours

h hours per worker

f strictly increasing, strictly concave, differentiable

x profitability (technology, demand etc.)

F per-worker fixed cost of working positive hours

Environment: Shocks & Private Insurance

Shocks

- profitability x subject to shocks: function $x(s)$ of state $s \in S$
- $\theta(s)$ is probability of state s

Two subsets of shocks

- simple setup with exogenous incomplete markets
- subset S_I is perfectly insured
- subset S_U is uninsured
- $S = S_I \cup S_U$

Environment: Preferences

$$\sum_{s \in S} \theta(s) \left\{ u(c(s)) - n(s) v(h(s)) \right\}$$

$c(s)$ consumption of each worker

u strictly increasing, strictly concave, differentiable

v strictly increasing, strictly convex, differentiable

Ownership

For simplicity no distinction between workers & firm owners: workers own and operate the firm.

Policy Instruments: UI and STC

Instruments

g_{UI}	payment to workers with zero hours worked
g_{STC}	payment to employed workers for every hour that hours worked fall short of "normal" level H
τ	proportional tax on total hours

net subsidy schedule

$$(1-n)g_{UI} + n\max[0, H-h]g_{STC} - \tau nh.$$

isolating coefficients on n and nh

$$\begin{cases} g_{UI} - n[g_{UI} - Hg_{STC}] - nh[g_{STC} + \tau], & h < H, \\ g_{UI} - ng_{UI} - nh\tau, & h \geq H. \end{cases}$$

Firm Problem

CHOOSE

$$c(s) \in \mathbb{R}_+, n(s) \in [0,1], h(s) \in [0, h^{\max}] \quad \forall\, s \in S$$

TO MAXIMIZE

$$\sum_{s \in S} \theta(s) \left\{ u(c(s)) - n(s) v(h(s)) \right\}$$

SUBJECT TO

$$\sum_{s \in S} \theta(s) \big\{ x(s) f(n(s) h(s)) - n(s) F - c(s) \big\} = 0$$

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SUBJECT TO

$$\sum_{s \in S_I} \theta(s) \Big\{ x(s) f(n(s)h(s)) - n(s)F - c(s) \Big\} = 0$$

$$c(s) = x(s) f(n(s)h(s)) - n(s)F \qquad \forall s \in S_U$$

FIRM PROBLEM

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TO MAXIMIZE

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SUBJECT TO

$$\sum_{s \in S_I} \theta(s) \{ x(s) f(n(s)h(s)) - n(s) - c(s) \\ + (1-n) g_{UI} + n \max[0, H-h] g_{STC} - \tau n h \} = 0$$

$$c(s) = x(s) f(n(s)h(s)) - n(s) F \\ + (1-n) g_{UI} + n \max[0, H-h] g_{STC} - \tau n h \qquad \forall s \in S_U$$

First-Order Conditions

Case: $n \leq 1$ slack

$$h(s)v'(h(s)) - v(h(s)) = u'(c(s))\, F$$

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Case: $n \leq 1$ slack

$$h(s)v'(h(s)) - v(h(s)) = u'(c(s))\ F$$

- hours constant in x across S_I
- hours decreasing in x across S_U

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Case: $n \leq 1$ binds

$$\frac{v'(h(s))}{u'(c(s))} = x(s)f'(h(s))$$

First-Order Conditions

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$$\frac{v'(h(s))}{u'(c(s))} = x(s)f'(h(s))$$

- hours increasing in x across S_I
- depends on income vs. substitution across S_U

First-Order Conditions

Case: $n \leq 1$ slack, $h > H$

$$h(s)v'(h(s)) - v(h(s)) = u'(c(s))[F + g_{UI}]$$

- hours constant in x across S_I
- hours decreasing in x across S_U

Case: $n \leq 1$ binds, $h > H$

$$\frac{v'(h(s))}{u'(c(s))} = x(s)f'(h(s)) - \tau$$

- hours increasing in x across S_I
- depends on income vs. substitution across S_U

First-Order Conditions

Case: $n \leq 1$ slack $, h < H$

$$h(s)v'(h(s)) - v(h(s)) = u'(c(s))[F + g_{UI} - Hg_{STC}]$$

- hours constant in x across S_I
- hours decreasing in x across S_U

Case: $n \leq 1$ binds $, h < H$

$$\frac{v'(h(s))}{u'(c(s))} = x(s)f'(h(s)) - \tau - g_{STC}$$

- hours increasing in x across S_I
- depends on income vs. substitution across S_U

Calibration: Shocks

Two Types

"permanent" $\theta(s_P) = 0.06$, $x(s_P) = 0$, always uninsured

"temporary" log-normal distribution, std. $\sigma_x = 0.1$

Scenario 1: Temporary Shocks Insured

- only s_P in S_U, temporary shock realizations in S_I
- precludes direct insurance effect of STC

Scenario 2: Temporary Shocks Uninsured

all shocks in S_U, S_I empty

Calibration: Functional Forms

Technology

$$f(nh) = (nh)^{\alpha}$$

Preferences

$$u(c) - nv(h) = \frac{c^{1-\sigma} - 1}{1-\sigma} - n\eta \frac{h^{1+\psi}}{1+\psi}$$

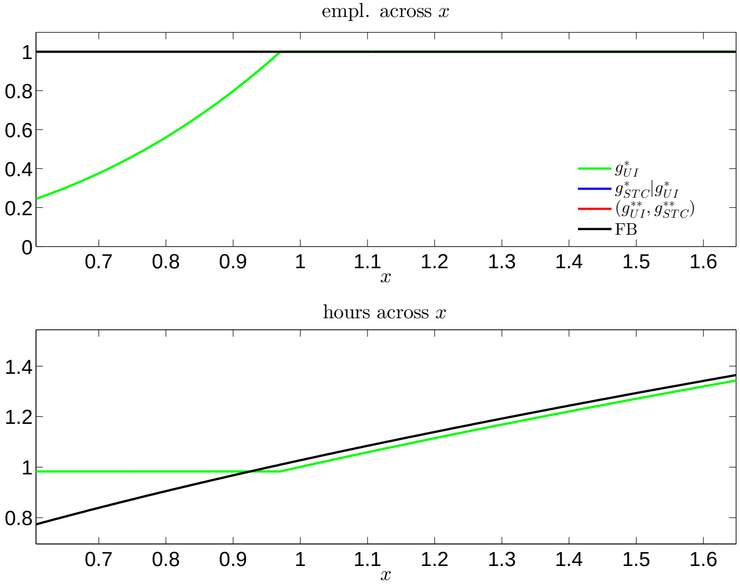
Calibration: Parameters

	Value	Target
σ	2	
ψ	1.43	Frisch elasticity of 0.7
α	0.667	
$\theta(s_P)$	0.06	unemployment due to permanent shocks 0.06
$F(F/\overline{y})$	0.108(0.121)	unemployment due to temporary shocks 0.02
σ_x	0.1	
η	0.40	normalization of average hours to one
H	1	setting normal hours equal to average hours
g_{UI}	0.219	replacement rate 0.25%
g_{STC}	0	no STC in calibration

Policy Configurations

g^*_{UI}	Optimal UI subject to no STC
$g^*_{STC} \vert g^*_{UI}$	Optimal STC with UI fixed at g^*_{UI}
$(g^{**}_{UI}, g^{**}_{STC})$	Optimal Combination of UI and STC

Scenario 1: Employment & Hours



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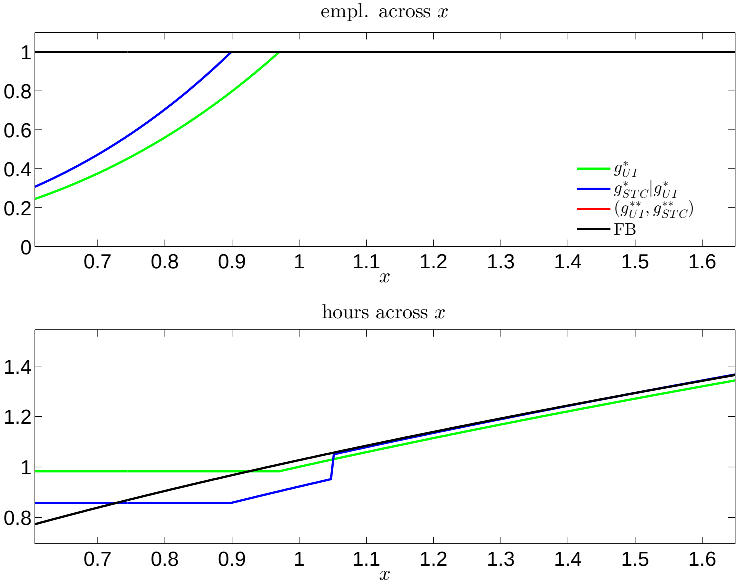

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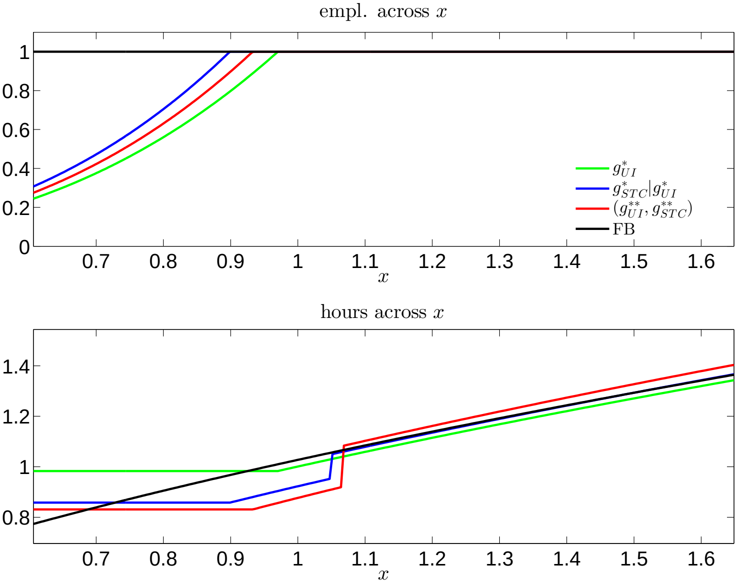


Scenario 1: Allocations

	Calibr.	g^*_{UI}	$g^*_{STC}\|g^*_{UI}$	$(g^{**}_{UI}, g^{**}_{STC})$	FB
g_{UI}	0.219	0.248	0.248	0.279	NA
g_{STC}	0	0	0.107	0.171	NA
Replacement Rate	0.25	0.288	0.292	0.339	NA
$\bar{n}_T$	0.98	0.932	0.981	0.962	1
$\bar{h}_T$	1	1.02	0.958	0.929	1.03
$\bar{y}_T$	0.891	0.877	0.866	0.839	0.92
$c(s_T)$	0.877	0.862	0.851	0.822	0.865
$c(s_P)$	0.219	0.248	0.248	0.279	0.865
Welf. rel. to FB	−12.1%	−11.1%	−10.3%	−9.64%	0%

Scenario 1: Summary & Discussion

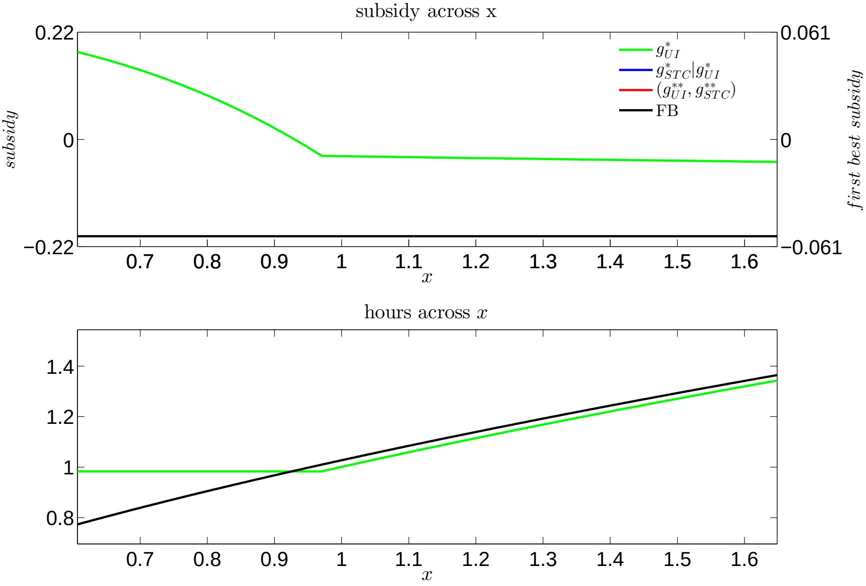
Welfare Gains of STC

- mitigation of labor input distortion caused by g_{UI}
- indirect insurance effect: enables more generous UI

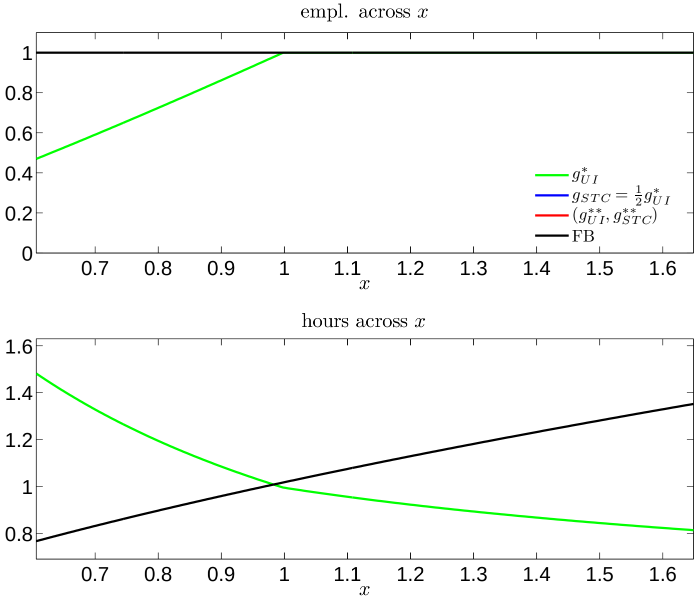
Magnitude of Welfare Gain

- sizable: 1.5%
- both welfare effects play an equally important role
- negative effect on hours, leading to a drop in output

Scenario 1: Hours & Net Subsidy



Scenario 2: Employment & Hours



SCENARIO 2: ALLOCATIONS

	Calibr.	Aut.	g^*_{UI}	$g_{STC} = \frac{1}{2} g^*_{UI}$	FB
g_{UI}	0.206	0	0.219	0.219	NA
g_{STC}	0	0	0	0.11	NA
Replacement Rate	0.25	0	0.269	0.278	NA
$\bar{n}_T$	0.98	1	0.949	0.953	1
$\bar{h}_T$	1	0.989	1.01	0.973	1.02
$\bar{y}_T$	0.836	0.839	0.828	0.802	0.866
$\bar{c}_T$	0.823	0.839	0.814	0.788	0.814
$c(s_P)$	0.206	0	0.219	0.219	0.814
Welf. rel. to FB	-13.2%		-12.8%	-13.1%	0%

Scenario 2: Summary & Discussion

Welfare Effects of STC

- negative direct insurance effect
- unable to counteract excessive layoffs
- both is driven by downward-sloping hours profile

Magnitude of Welfare Losses

- welfare loss of adopting $g_{STC} = \frac{1}{2} g^*_{UI}$: 0.3%
- negative insurance effect is minor: 0.04%

SUMMARY

WHAT WE DID

- built on Burdett & Wright (1989)
- analyzed welfare/optimal policy

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Future Work

- empirically implement identification of extent of private insurance against temporary shocks
- dynamic version of model