

# Countercyclical Unemployment Benefits under Incomplete Markets

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## Main question

*What are the welfare consequences of countercyclical unemployment benefits when insurance markets are incomplete?*

## Motivation I: Policy relevance

European Commission 2011 Annual Growth Survey:

*Member States need to adapt their unemployment insurance systems to the economic cycle, so that protection is reinforced in times of economic down-turn.*

Walsh (2011) on the UK:

*... [T]here has been no real consideration of the need to change UB in line with a deteriorating economy. The debate over whether UB (and particularly the duration of payments) should be designed in a counter cyclical way is far from clear cut.*

# Motivation II: Gaps in the literature

## Savings behaviour and general equilibrium effects

### Three streams of literature

- ▶ In the tradition of Hopenhayn and Nicolini (1997)
  - ▶ Kiley (2003): no saving/borrowing, wages constant, concentrate on welfare of unemployed, abstracts from financing issues
- ▶ Empirical literature in the spirit of Chetty (2003, 2008)
  - ▶ Kroft and Notowidigdo (2011): partial equilibrium setting with hand-to-mouth consumers
- ▶ GE search and matching models - complete insurance against idiosyncratic risk, no savings/borrowing over time
  - ▶ Andersen and Svarer (2010), Ek (2012)
  - ▶ Landais, Michaillat and Saez (2010) - micro  $>$  macro elasticity of unemployment to  $b$  - rat race
  - ▶ Mitman and Rabinovich (2012) - raise in the  $s$ - $r$ , cut  $l$ - $r$

# What we do

1. Re-calibrate a version of the Krusell and Smith (1998) model to fit UK data
2. Introduce state-dependent unemployment benefits
3. Look at various funding options

# Our findings

1. A realistic reform would leave **aggregate variables virtually unchanged in the long run** but wealth and income **inequality would widen**
2. Stabilization: **volatility in aggregate consumption drops** considerably but mainly due to re-allocation of consumption towards consumption smoothers
3. **The long-run welfare gains are unlikely to be positive** unless a non-distortive means of financing the reform is found

# The model in a nutshell

- ▶ Ex ante identical individuals
  - ▶ An agent's 'fortune' is purely a matter of fortune
  - ▶ Two sources of uncertainty: individual and aggregate
- ▶ Incomplete markets
  - ▶ No perfect insurance, borrowing constraint
  - ▶ Two sources of insurance: self-insurance, public insurance (tax and benefit system)
- ▶ Savings and labour supply decision

# The model

## The agents' problem

$$V(s, Z) = \max_{c, l, k'} \{ u(c, l) + \beta E [V(s', Z') | s, Z] \}$$

$$\text{subject to } c + k' = (1 + r(Z))k + w(Z)l(Z)\varepsilon + b(Z)l(1 - \varepsilon) - T(s, Z),$$

$$c \geq 0; l \in [0, 1],$$

$$k' \geq k_{\min},$$

$$K' = H(K, \Lambda, \Lambda').$$



# The baseline model

## Specific functional forms

- ▶ Preferences are of GHH type

$$u(c, l) = \frac{1}{1-\gamma} \left[ \left( c - \psi \frac{l^{1+\frac{1}{\phi}}}{1+\frac{1}{\phi}} \right)^{1-\gamma} - 1 \right]$$

- ▶ The tax schedule is an integrated tax-and-benefit scheme

$$T = \begin{cases} \tau [w(Z) l(Z) \varepsilon - \bar{y}] & \text{if } k < 0 \\ \tau [r(Z) k + w(Z) l(Z) \varepsilon - \bar{y}] & \text{if } k \geq 0 \end{cases}$$

# The baseline model and its countercyclical variants

## Government

- ▶ Raises taxes to fund unemployment benefit and (wasteful) government spending
- ▶ Balances the budget every period  $T = B + G$
- ▶ Unemployment benefits are constant at  $b$  in the baseline model but are state-dependent as follows:
  1. **benefit change:**  $b(\Lambda_b) = 1.25b$ ,  $b(\Lambda_g) = b$ , financed by a cut in  $G$
  2. **tax + benefit change:**  $b(\Lambda_b) = 1.25b$ ,  $b(\Lambda_g) = b$ , whilst raising  $\tau$ , leaving average  $G$  unchanged

# Solving the model

## Calibration

- ▶ aggregate productivity
  - ▶ level: one percent higher (lower) in a good (bad) state than in the steady state
  - ▶ persistence: 8 quarters
- ▶ unemployment (consistent with Long, 2009)
  - ▶ rate in the bad (good) aggregate state is calibrated to be 10 (4) percent
  - ▶ persistence: 1.5 (2.5) quarters in good (bad) times

# Solving the model

## Calibration

- ▶ Calibrate a non-stochastic steady state (aggregate productivity is  $\Lambda = 1$ ) to obtain some parameter values
  - ▶ capital share of income  $\alpha = 0.36$ ,
  - ▶ quarterly depreciation rate  $\delta = 0.025$ ,
  - ▶ coefficient of risk aversion  $\gamma = 2$
  - ▶ borrowing limit  $k_{\min}$  to  $-8$  ( $\approx$  mean annual wage income in the economy)
  - ▶  $b \approx 11$  percent of the mean wage in the economy (UK replacement rate 2009-10)
  - ▶  $\bar{y} \approx 35\%$  of the mean wage in the economy (UK personal allowance 27% + tax credits)
- ▶ endogenous parameters:
  - ▶  $\tau$  is set so that  $G/Y$  is 0.2 (UK central government spending excluding welfare and pensions)
  - ▶  $\psi$  is set so that given  $\tau$ ,  $\bar{L} = 0.9$

# Results

Baseline economy matches (some) UK data well

- ▶ quick checks
  - ▶ zero-income household receives - 14 percent of mean wage in the economy  $\approx$  observed ratio of non-contributory benefits of the bottom income decile to the average wage in the UK in 2009-10
  - ▶ top decile people 30 percent average tax rate (direct and indirect)

Table: Inequality measures

	GINI $k$	top 5%	top 10%	top 30%	b 10%	<i>pop.w / cum</i> <i>0 wealth</i>
Baseline	59	30	47	76	0.9	2.7
Target	61	30	44	75	0.1	1.8

# Results

Long-run effects: aggregate shifts small

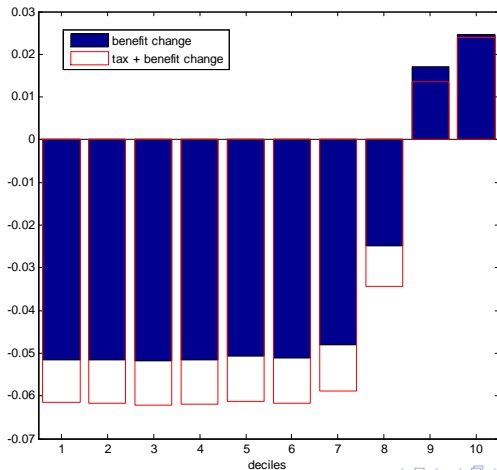
**Table:** Percentage change in headline variables relative to baseline

	Y	C	K	L	w	G
Benefit change	0.0	0.1	-0.1	0.0	0.0	-0.5
Tax and benefit change	-0.3	-0.3	-0.5	-0.2	-0.1	0.0

# Results

Long-run effects: significant redistribution from the poor to the rich

Figure: Change in mean capital holdings by deciles of the capital distribution



# Results

Long-run effects: significant redistribution from the poor to the rich

Table: Wealth inequality indicators

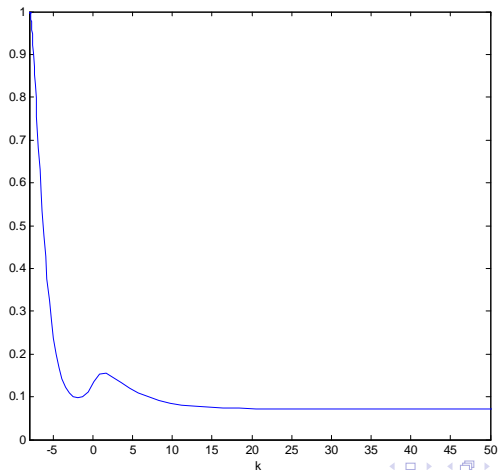
	GINI $k$	top 5%	top 10%	top 30%	b 10%	<i>popul. w/ cum 0 wealth</i>
Baseline	58.9	29.5	46.8	75.5	0.89	2.7
Tax+ben	60.4	30.4	48.2	76.9	0.85	2.4



# Results

Higher benefit helps avoiding debt on the margin

**Figure:** Fraction of the benefit increase consumed in the long run by different wealth groups



# Results

Long-run effects: significant stabilization...

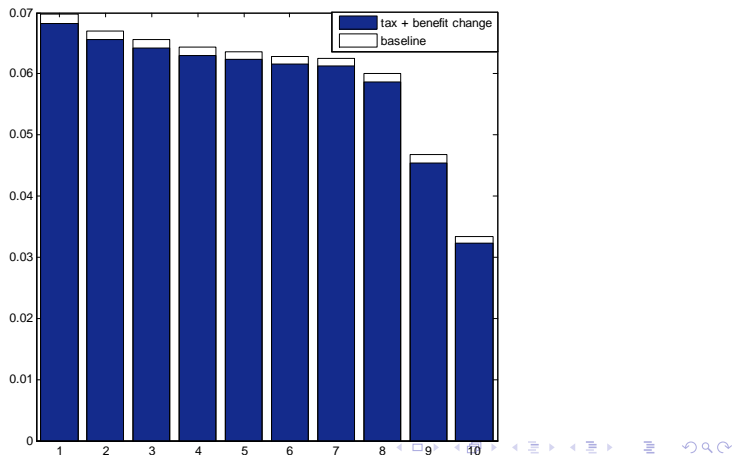
**Table:** Percentage change in the coefficient of variation of variables relative to baseline

Y	C	K	L	G	T	U	c	GINIk
-0.7	-5.4	-6.1	-0.1	6.5	-0.2	20.1	-2.2	-16.3

# Results

Long-run effects: significant stabilization...but mainly through re-allocation of consumption

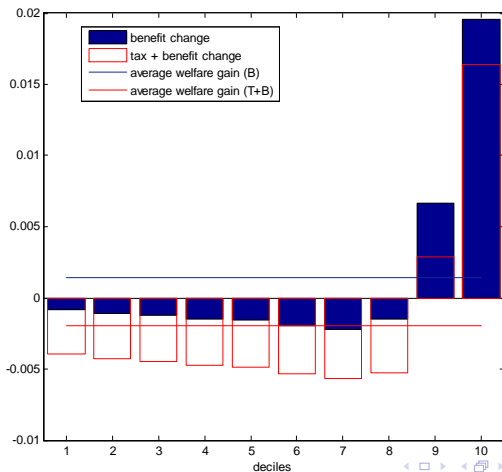
Figure: Coefficient of variation in consumption by wealth deciles before and after the reform



# Results

## Long-run welfare analysis

**Figure:** Long-run welfare gains by deciles of the wealth distribution (percent of mean aggregate consumption)



# Summary

## Consequences of countercyclical benefits

1. Aggregate variables largely unaffected in the long run
2. Increase in inequality: reduction in precautionary saving + general equilibrium gains for the rich
3. Stabilization mainly through an increase in the share of consumption smoothers

# Agenda

1. Experiments with different benefit duration
2. Moral hazard - e.g. in the spirit of Hansen and Imhororoglu (1992)
3. Transition