Welfare and Spending Effects of Consumption Stimulus Policies

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Related literature

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▶ **Welfare measures in HA models**: Bhandari, Evans, Golosov and Sargent (2021); Dávila and Schaab (2022)

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- ▶ Robustness Exercise: HANK model

Quantitative Micro Realism

Idiosyncratic income process: Friedman/Muth (transitory and permanent shocks)

$$\mathbf{p} \quad - \quad \text{'permanent income'} \tag{1}$$

$$\xi \quad - \quad \text{'transitory income shock'} \tag{2}$$

$$\psi \quad - \quad \text{'permanent income shock'} \tag{3}$$

$$\mathbf{p}_{t+1} = G\mathbf{p}_t \psi_{t+1}$$
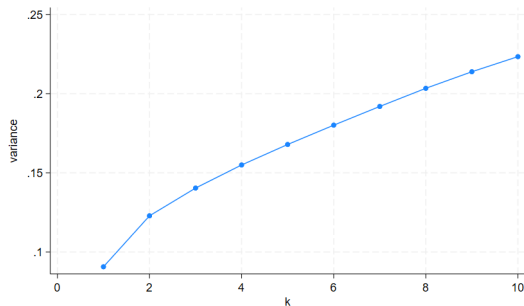$$y_{t+1} = \mathbf{p}_{t+1}\xi_{t+1}$$

Evidence?

For $n > 3$,

$$\mathrm{var}(\log y_{t+n}/y_t) = 2\sigma^2_{\log \xi} + n\sigma^2_{\log \psi} \tag{4}$$

Millions of datapoints from Norwegian National Registry:

Source: SSB (Elin Halvorsen)

Also see Crawley, Holm, and Tretvoli (2022)

Preferences, Beliefs, and Wealth

Infinite horizon model: target wealth depends on 'Growth Impatience' condition:

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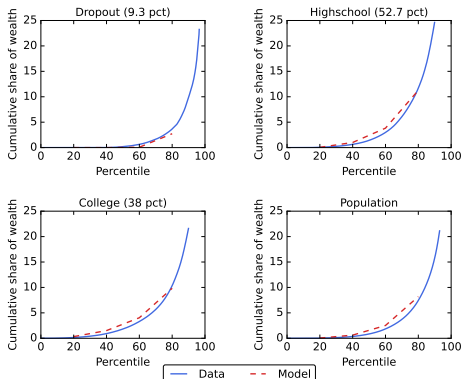*Degree* of impatience (1-GPF) determines *size* of target

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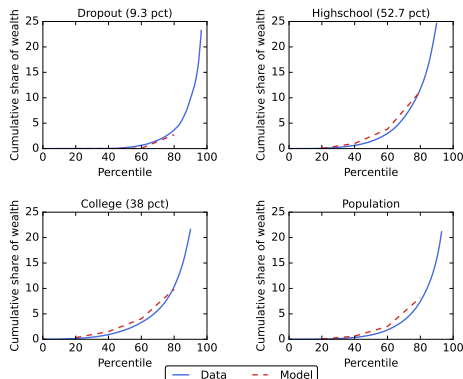- ▶ G or R would do as well

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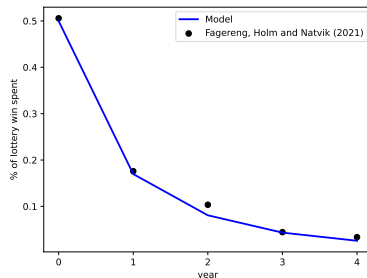
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Intertemporal MPC from Fagereng, Holm, Natvik (2021)

Modeling device: 'Splurge' in consumption, i.e. exogenously given fraction of income directly consumed

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    - ▶ Welfare (only recession-related welfare impact)

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  - ▶ Poorly targeted and much spending likely to occur after end of recession

Model

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$$\sum_{t=0}^{\infty} \beta_i^t (1 - D)^t \mathbb{E}_0 u(\mathbf{c}_{opt,i,t}). \tag{6}$$

(D: end-of-life probability, u: stand. CRRA utility func.)

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- ▶ Budget constraint, given existing market resources $m_{i,t}$ and income state, and a no-borrowing constraint:

$$\mathbf{m}_{i,t+1} = R \underbrace{(\mathbf{m}_{i,t} - \mathbf{c}_{sp,i,t} - \mathbf{c}_{opt,i,t})}_{\geq 0 \text{ (no-borrowing constraint)}} + \mathbf{y}_{i,t+1} \tag{7}$$

(R: exogenous gross interest rate)

Income process

▶ Income subject to transitory, unempl. and permanent shocks

$$\mathbf{y}_{i,t} = \begin{cases} \xi_{i,t}\mathbf{p}_{i,t}, & \text{if employed} \\ 0.7\mathbf{p}_{i,t}, & \text{if unemployed for} \leq 2q \\ 0.5\mathbf{p}_{i,t}, & \text{if unemployed} \geq 2q \end{cases} \tag{8}$$

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- ▶ Employment status is subject to a Markov process

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($\xi_{i,t}$: trans. shock, p: perm. income)

- ▶ "Permanent income": $\mathbf{p}_{i,t+1} = \underbrace{\psi_{i,t+1}}_{\text{perm. shock}} \underbrace{\Gamma_{e(i)}}_{\text{educ.-specific growth}} \mathbf{p}_{i,t}$

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▶ Recession is given by an MIT shock; end of recession as a Bernoulli process (avg. length of 6q)

Aggregate demand effects

(as in Krueger, Mitman and Perri, 2016)

▶ Baseline: No feedback from aggregate consumption to income

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- ▶ The AD effect is given by

$$AD(C_t) = \begin{cases} \left(\frac{C_t}{\tilde{C}}\right)^{\kappa}, & \text{if in a recession} \\ 1, & \text{otherwise,} \end{cases} \quad (9)$$

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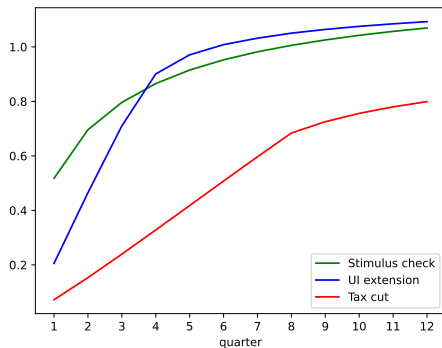where $\tilde{C}$ is the level of consumption in the steady state.

- ▶ Idiosyncratic income in the extension model is then given by

$$\mathbf{y}_{AD,i,t} = AD(C_t)\mathbf{y}_{i,t}. \tag{10}$$

Results

Multipliers

$$M_t^P = \frac{\text{NPV of induced consumption up to } t}{\text{NPV of the cost of the policy}}$$

	Stimulus check	UI extension	Tax cut
10y-horizon Multiplier (no AD effect)	0.872	0.910	0.847
10y-horizon Multiplier (AD effect)	1.245	1.200	0.999
Share of policy expenditure during recession	100.0%	80.6%	57.6 %

Robustness: Multipliers in HANK

Figure: HA + AD effects

Figure: HANK

Welfare measure construction

Guiding principles

1. Each consumer is valued equally by the social planner
2. Utility from splurge in the same way as other spending
3. No social benefit to the policies outside of a recession

Simple aggregation of consumer util. only satisfies principle 1 & 2:

$$\mathcal{W}(\text{policy}, Rec, AD) = \frac{1}{N} \sum_{i=1}^{N} \sum_{t=0}^{\infty} \beta_S^t u(\mathbf{c}_{it,\text{policy},Rec,AD})$$
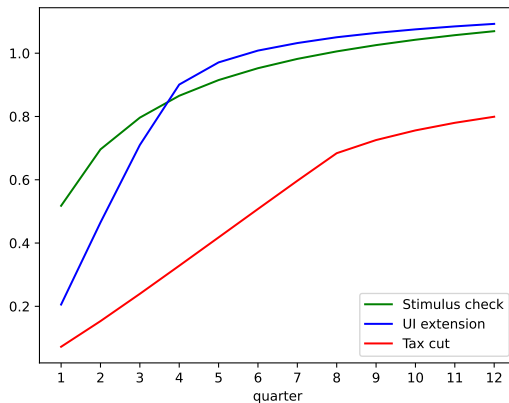
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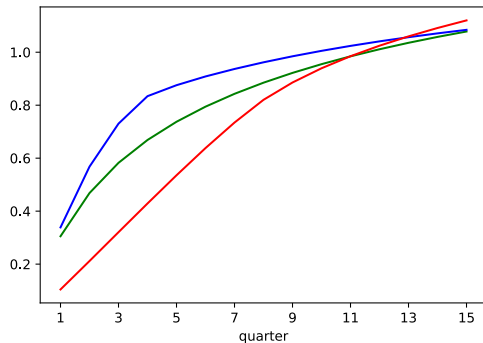
▶ Net welfare: Subtract the welfare cost of financing the policy

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▶ Recession-based net welfare: Subtract the net welfare impact of policy outside of recession

Welfare results

	Check	UI	Tax Cut
Without AD effects	0.011	0.509	0.002
With AD effects	0.151	1.101	0.056

▶ All policies adjusted to the fiscal size of the UI extension

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- ▶ All policies much more effective when mulitplier present

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- Framework can be used to evaluate other candidate policies

Thank you for your attention!

▶ Access the paper, presentation slides and code at: https://github.com/llorracc/HAFiscal

Appendix

Parameters describing the policies

Parameters describing policy experiments	
Parameter	Value
Change in unemployment rates in a recession	×2
Expected unemployment spell in a recession	4 quarters
Average length of recession	6 quarters
Size of stimulus check	$1,200
PI threshold for reducing check size	$100,000
PI threshold for not receiving check	$150,000
Extended unemployment benefits	4 quarters
Length of payroll tax cut	8 quarters
Income increase from payroll tax cut	2 percent
Belief (probability) that tax cut is extended	50 percent

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▶ $\beta_S = 1/R$: social planner's discount factor

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To satisfy principle 3 we define $\mathcal{C}(\text{policy}, \textit{Rec}, \textit{AD}) =$

$$
\left(\underbrace{\frac{\mathcal{W}(\text{policy}, \textit{Rec}, \textit{AD}) - \mathcal{W}(\text{None}, \textit{Rec}, \textit{AD})}{\mathcal{W}^c}}_{\text{I}} - \underbrace{\frac{PV(\text{policy}, \textit{Rec})}{\mathcal{P}^c}}_{\text{II}} \right)
$$

$$
- \left(\underbrace{\frac{\mathcal{W}(\text{policy}, 0, 0) - \mathcal{W}(\text{None}, 0, 0)}{\mathcal{W}^c}}_{\text{III}} - \underbrace{\frac{PV(\text{policy}, 0)}{\mathcal{P}^c}}_{\text{IV}} \right)
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- ▶ $\mathcal{C}$ measures only welfare effects beyond pure redistribution

Robustness: Different replacement rates

▶ Discount factor distributions:

		Splurge	Dropout β	∇	Highschool β	∇	College β	∇
Baseline	($\rho_b = 0.7$, $\rho_{nb} = 0.5$)	0.306	0.735	0.298	0.924	0.137*	0.984	0.010
Altern.	($\rho_b = 0.3$, $\rho_{nb} = 0.15$)	0.306	0.609	0.445*	0.890	0.116	0.978	0.016

		Stimulus check	UI extension	Tax cut
no AD effects	Baseline ($\rho_b = 0.7$, $\rho_{nb} = 0.5$)	0.011	0.509	0.002
	Altern. ($\rho_b = 0.3$, $\rho_{nb} = 0.15$)	0.043	1.845	0.003
AD effects	Baseline ($\rho_b = 0.7$, $\rho_{nb} = 0.5$)	0.151	1.101	0.056
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Robustness: Different interest rates

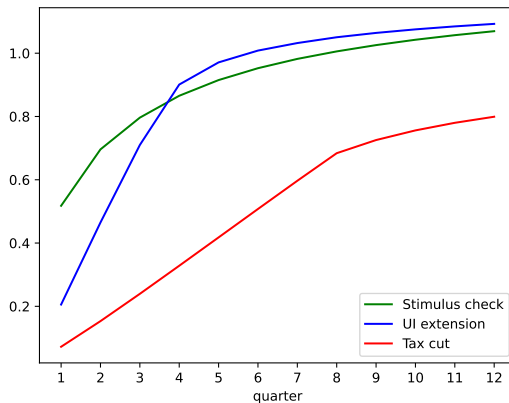|	Splurge	Dropout		Highschool		College	
		β	∇	β	∇	β	∇
$R = 1.005$	0.307	0.740	0.298	0.927	0.193*	0.989	0.0082
$R = 1.01$ (baseline)	0.307	0.735	0.298	0.924	0.137*	0.984	0.0096
$R = 1.015$	0.307	0.724	0.357*	0.919	0.138*	0.979	0.0105

Robustness: Multipliers in HANK

Figure: HA + AD effects

Figure: HANK