Welfare and Spending Effects of Consumption Stimulus Policies

Christopher D. Carroll (JHU) Edmund Crawley (FED) William Du (JHU)
Ivan Frankovic (BBK) Håkon Tretvoll (SSB)

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Related literature

- **Effects of transitory income shocks**: Parker, Souleles, Johnson and McClelland (2013); Broda and Parker (2014); Fagereng, Holm and Natvik (2021); Ganong, Greig, Noel, Sullivan and Vavra (2022)

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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)

$$\begin{aligned} \mathrm{p} &- \text{'permanent income'} && (1)\\ \theta &- \text{'transitory income shock'} && (2)\\ \psi &- \text{'permanent income shock'} && (3) \end{aligned}$$

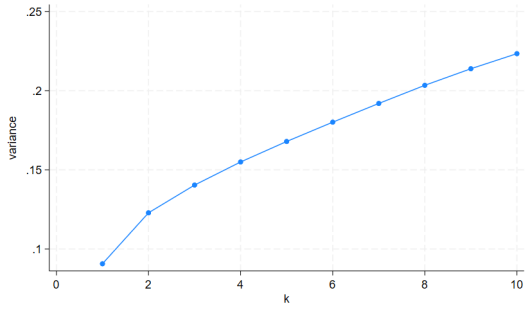
$$\begin{aligned} \mathrm{p}_{t+1} &= G\mathrm{p}_t\psi_{t+1}\\ y_{t+1} &= \mathrm{p}_{t+1}\theta_{t+1} \end{aligned}$$

Evidence?

For $n > 3$,

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

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:

$$\underbrace{\left(\frac{(\mathsf{R}\beta)^{1/\gamma}}{G\mathbb{E}[\psi^{-1}]}\right)}_{\text{'Growth Patience Factor'}} < 1 \tag{5}$$

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Consistency With Micro Evidence?

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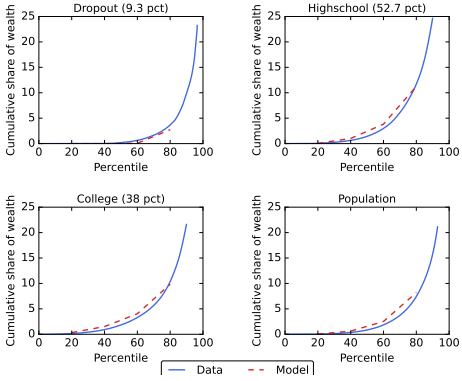

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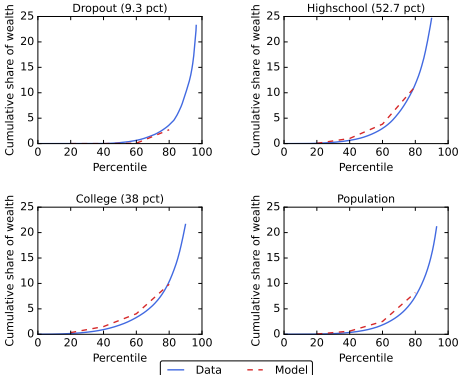
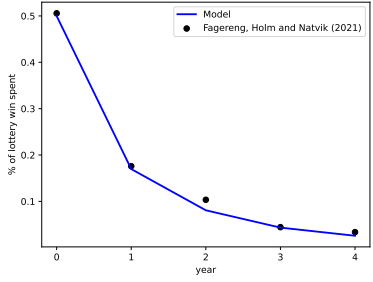


Intertemporal MPC from Fagereng, Holm, Natvik (2021)



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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- Remaining consumption $c_{opt,i,t}$ is chosen to maximize utility

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

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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

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

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- Employment status is subject to a Markov process
  - Unemployment rate education-specific (doubles in recession)

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

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

- Employment status is subject to a Markov process
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Aggregate demand effects

(as in Krueger, Mitman and Perri, 2016)

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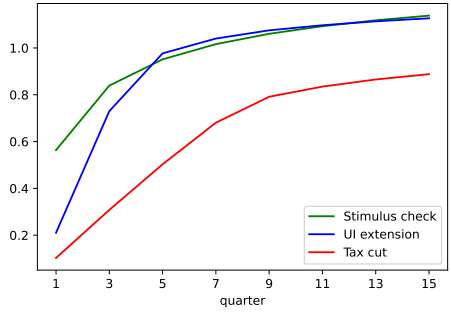
- Idiosyncratic income in the extension model is then given by

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

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

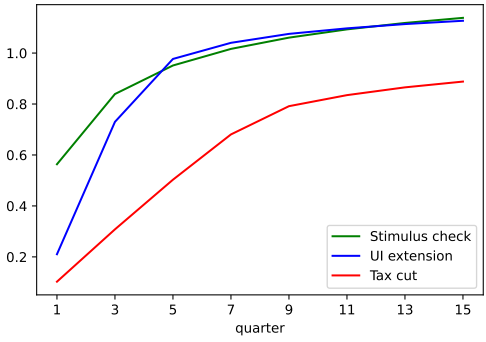


Figure: HA + AD effects

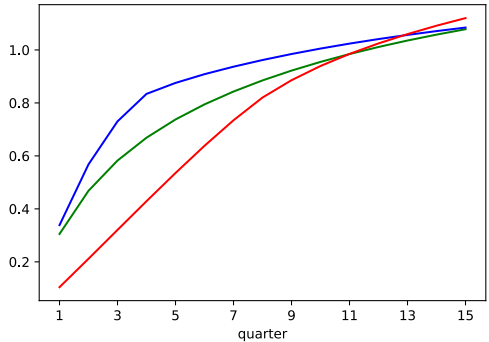


Figure: HANK

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

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Welfare results

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

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- The tax cut is both poorly targeted and may yield substantial spending after the recession is over
- 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	$\times 2$
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

Go back

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

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

$$\Bigg(\underbrace{\frac{\mathcal{W}(\text{policy}, Rec, AD) - \mathcal{W}(\text{None}, Rec, AD)}{\mathcal{W}^c}}_{\text{I}} - \underbrace{\frac{PV(\text{policy}, Rec)}{\mathcal{P}^c}}_{\text{II}}\Bigg)$$
$$- \Bigg(\underbrace{\frac{\mathcal{W}(\text{policy}, 0, 0) - \mathcal{W}(\text{None}, 0, 0)}{\mathcal{W}^c}}_{\text{III}} - \underbrace{\frac{PV(\text{policy}, 0)}{\mathcal{P}^c}}_{\text{IV}}\Bigg)$$

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- $\mathcal{C}$ measures only welfare effects beyond pure redistribution

Robustness: Different replacement rates

- Discount factor distributions:

			Dropout		Highschool		College	
		Splurge	β	∇	β	∇	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
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Robustness: Different interest rates

		Dropout		Highschool		College	
	Splurge	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

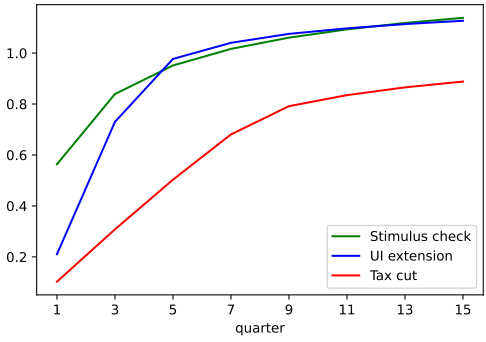

Figure: HA + AD effects

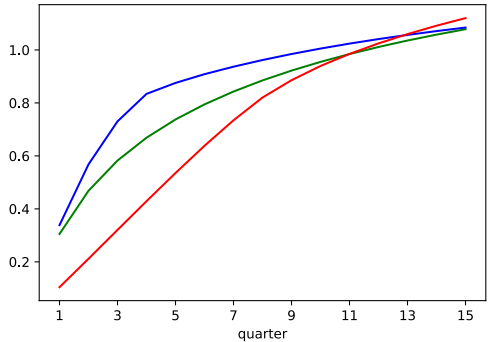

Figure: HANK