References

Table 1 Calibration

	Macroeconomic Parameters	
γ	0.36	Capital's Share of Income
$\daleth$	$0.94^{1/4}$	Depreciation Factor
σ^2_{Θ}	0.00001	Variance Aggregate Transitory Shocks
σ^2_{Ψ}	0.00004	Variance Aggregate Permanent Shocks
	Steady State of Perfect Foresight DSGE Model	
	$(\sigma_{\Psi} = \sigma_{\Theta} = \sigma_{\psi} = \sigma_{\theta} = \wp = \mathsf{D} = 0,\ \Phi_t = 1)$	
$\breve{K}/\breve{K}^{\gamma}$	12.0	SS Capital to Output Ratio
$\breve{K}$	48.55	SS Capital to Labor Productivity Ratio ($= 12^{1/(1-\gamma)}$)
$\breve{\mathsf{W}}$	2.59	SS Wage Rate ($= (1-\gamma)\breve{K}^{\gamma}$)
$\breve{\mathsf{r}}$	0.03	SS Interest Rate ($= \gamma\breve{K}^{\gamma-1}$)
$\breve{\mathfrak{R}}$	1.015	SS Between-Period Return Factor ($= \daleth + \breve{\mathsf{r}}$)
	Preference Parameters	
ρ	2.	Coefficient of Relative Risk Aversion
β_{SOE}	0.970	SOE Discount Factor
β_{DSGE}	0.986	HA-DSGE Discount Factor ($= \breve{\mathfrak{R}}^{-1}$)
Π	0.25	Probability of Updating Expectations (if Sticky)
	Idiosyncratic Shock Parameters	
σ^2_{θ}	0.120	Variance Idiosyncratic Tran Shocks ($=4\times$ Annual)
σ^2_{ψ}	0.003	Variance Idiosyncratic Perm Shocks ($=\frac{1}{4}\times$ Annual)
$\wp$	0.050	Probability of Unemployment Spell
D	0.005	Probability of Mortality

Table 2 Equilibrium Statistics

	SOE Model		HA-DSGE Model	
	Frictionless	Sticky	Frictionless	Sticky
Means				
A	7.49	7.43	56.85	56.72
C	2.71	2.71	3.44	3.44
Standard Deviations				
Aggregate Time Series ('Macro')				
$\log A$	0.332	0.321	0.276	0.272
$\Delta \log \mathbf{C}$	0.010	0.007	0.010	0.005
$\Delta \log \mathbf{Y}$	0.010	0.010	0.007	0.007
Individual Cross Sectional ('Micro')				
$\log \mathbf{a}$	0.926	0.927	1.015	1.014
$\log \mathbf{c}$	0.790	0.791	0.598	0.599
$\log p$	0.796	0.796	0.796	0.796
$\log \mathbf{y} \vert \mathbf{y} > 0$	0.863	0.863	0.863	0.863
$\Delta \log \mathbf{c}$	0.098	0.098	0.054	0.055
Cost of Stickiness	4.82e–4		4.51e–4	

Notes: The cost of stickiness is calculated as the proportion by which the permanent income of a newborn frictionless consumer would need to be reduced in order to achieve the same reduction of expected value associated with forcing them to become a sticky expectations consumer.

Table 3 Aggregate Consumption Dynamics in US Data

$$\Delta \log \mathbf{C}_{t+1} = \varsigma + \chi \Delta \log \mathbf{C}_t + \eta\, \mathbb{E}_t[\Delta \log \mathbf{Y}_{t+1}] + \alpha A_t + \epsilon_{t+1}$$

Measure of Consumption Independent Variables			OLS or IV	2nd Stage $\bar{R}^2$	KP p-val Hansen J p val
Nondurables and Services					
$\Delta \log \mathbf{C}_t$	$\Delta \log \mathbf{Y}_{t+1}$	A_t			
0.468***			OLS	0.216	
(0.076)					
0.830***			IV	0.278	0.222
(0.098)					0.439
	0.587***		IV	0.203	0.263
	(0.110)				0.319
		−0.17e−4	IV	−0.005	0.081
		(5.71e−4)			0.181
0.618***	0.305*	−4.96e−4*	IV	0.304	0.415
(0.159)	(0.161)	(2.94e−4)			0.825
Memo: For instruments $\mathbf{Z}_t, \Delta \log \mathbf{C}_t = \mathbf{Z}_t \zeta,\ \bar{R}^2 = 0.358$					
Nondurables					
$\Delta \log \mathbf{C}_t$	$\Delta \log \mathbf{Y}_{t+1}$	A_t			
0.200***			OLS	0.036	
(0.058)					
0.762***			IV	0.083	0.504
(0.284)					0.727
	0.849**		IV	0.061	0.398
	(0.357)				0.731
		9.09e−4	IV	0.008	0.118
		(9.05e−4)			0.446
0.620**	0.313	−3.25e−4	IV	0.077	0.523
(0.292)	(0.286)	(8.32e−4)			0.821
Memo: For instruments $\mathbf{Z}_t, \Delta \log \mathbf{C}_t = \mathbf{Z}_t \zeta,\ \bar{R}^2 = 0.080$					

Notes: Robust standard errors are in parentheses. Instruments $\mathbf{Z}_t = \{\Delta \log \mathbf{C}_{t-2}, \Delta \log \mathbf{C}_{t-3}, \Delta \log \mathbf{Y}_{t-2}, \Delta \log \mathbf{Y}_{t-3}, A_{t-2}, A_{t-3}, \Delta_8 \log \mathbf{C}_{t-2}, \Delta_8 \log \mathbf{Y}_{t-2},$ lags 2 and 3 of differenced Fed funds rate, lags 2 and 3 of the Michigan Index of Consumer Sentiment Expectations$\}$. The penultimate column reports the $\bar{R}^2$ from a regression of the dependent variable on the RHS variables (instrumented, when indicated); the final column reports two tests of instrument validity: The p-value from the Kleibergen–Paap Wald rk F statistic of first-stage instrument validity (top), and the p-value from the Hansen–Sargan overidentification test (bottom). $\{^*, ^{**}, ^{***}\}$ = Statistical significance at $\{10, 5, 1\}$ percent.
Data sources are NIPA and US Financial Accounts, 1960Q1–2016Q4. Income ($\mathbf{Y}$) is measured as as wages, salaries and transfers, net of social insurance. Wealth–income ratio (A_t) is measured as the ratio of net worth to income.

Table 4 Micro Consumption Regression on Simulated Data

$$\Delta \log \mathbf{c}_{t+1,i} \quad = \quad \varsigma + \chi \Delta \log \mathbf{c}_{t,i} + \eta \mathbb{E}_{t,i}[\Delta \log \mathbf{y}_{t+1,i}] + \alpha \bar{a}_{t,i} + \epsilon_{t+1,i}.$$

Model of Expectations	χ	η	α	$\bar{R}^2$
Frictionless				
	0.019			0.000
	(–)			
		0.011		0.004
		(–)		
			−0.190	0.010
			(–)	
	0.061	0.016	−0.183	0.017
	(–)	(–)	(–)	
Sticky				
	0.012			0.000
	(–)			
		0.011		0.004
		(–)		
			−0.191	0.010
			(–)	
	0.051	0.015	−0.185	0.016
	(–)	(–)	(–)	

Notes: $\mathbb{E}_{t,i}$ is the expectation from the perspective of person i in period t; $\bar{a}$ is a dummy variable indicating that agent i is in the top 99 percent of the normalized a distribution. Simulated sample size is large enough such that standard errors are effectively zero. Sample is restricted to households with positive income in period t. The notation "(—)" indicates that standard errors are close to zero, given the very large simulated sample size.

Table 5 Aggregate Consumption Dynamics in SOE Model

$$\Delta \log \mathbf{C}_{t+1} = \varsigma + \chi \Delta \log \mathbf{C}_t + \eta \mathbb{E}_t[\Delta \log \mathbf{Y}_{t+1}] + \alpha A_t + \epsilon_{t+1}$$

Expectations : Dep Var Independent Variables			OLS or IV	2nd Stage $\bar{R}^2$	KP p-val Hansen J p-val
Frictionless : $\Delta \log \mathbf{C}^*_{t+1}$ (with measurement error $\mathbf{C}^*_t = \mathbf{C}_t \times \xi_t$);					
$\Delta \log \mathbf{C}^*_t$	$\Delta \log \mathbf{Y}_{t+1}$	A_t			
0.295$^{\bullet\bullet\bullet}$			OLS	0.087	
(0.066)					
0.660$^{\bullet\bullet}$			IV	0.040	0.237
(0.309)					0.600
	0.457$^{\bullet\bullet}$		IV	0.035	0.059
	(0.209)				0.421
		−6.92e–4	IV	0.026	0.000
		(5.87e–4)			0.365
0.420	0.258	0.45e–4	IV	0.041	0.516
(0.428)	(0.365)	(9.51e–4)			0.529
Memo: For instruments $\mathbf{Z}_t$, $\Delta \log \mathbf{C}^*_t = \mathbf{Z}_t \zeta$, $\bar{R}^2 = 0.039$; var(log(ξ_t)) = 5.99e–6					
Sticky : $\Delta \log \mathbf{C}^*_{t+1}$ (with measurement error $\mathbf{C}^*_t = \mathbf{C}_t \times \xi_t$);					
$\Delta \log \mathbf{C}^*_t$	$\Delta \log \mathbf{Y}_{t+1}$	A_t			
0.508$^{\bullet\bullet\bullet}$			OLS	0.263	
(0.058)					
0.802$^{\bullet\bullet\bullet}$			IV	0.260	0.000
(0.104)					0.554
	0.859$^{\bullet\bullet\bullet}$		IV	0.198	0.060
	(0.182)				0.233
		−8.26e–4$^{\bullet\bullet}$	IV	0.066	0.000
		(3.99e–4)			0.002
0.660$^{\bullet\bullet\bullet}$	0.192	0.60e–4	IV	0.261	0.359
(0.187)	(0.277)	(5.03e–4)			0.546
Memo: For instruments $\mathbf{Z}_t$, $\Delta \log \mathbf{C}^*_t = \mathbf{Z}_t \zeta$, $\bar{R}^2 = 0.260$; var(log(ξ_t)) = 5.99e–6					

Notes: Reported statistics are the average values for 100 samples of 200 simulated quarters each. Bullets indicate that the average sample coefficient divided by average sample standard error is outside of the inner 90%, 95%, and 99% of the standard normal distribution. Instruments $\mathbf{Z}_t = \{\Delta \log \mathbf{C}_{t-2}, \Delta \log \mathbf{C}_{t-3}, \Delta \log \mathbf{Y}_{t-2}, \Delta \log \mathbf{Y}_{t-3}, A_{t-2}, A_{t-3}, \Delta_8 \log \mathbf{C}_{t-2}, \Delta_8 \log \mathbf{Y}_{t-2}\}$.

Table 6 Aggregate Consumption Dynamics in HA-DSGE Model

$$\Delta \log \mathbf{C}_{t+1} = \varsigma + \chi \Delta \log \mathbf{C}_t + \eta \mathbb{E}_t[\Delta \log \mathbf{Y}_{t+1}] + \alpha A_t + \epsilon_{t+1}$$

Expectations : Dep Var Independent Variables			OLS or IV	2^{nd} Stage $\bar{R}^2$	KP p-val Hansen J p-val
Frictionless : $\Delta \log \mathbf{C}^*_{t+1}$ (with measurement error $\mathbf{C}^*_t = \mathbf{C}_t \times \xi_t$);					
$\Delta \log \mathbf{C}^*_t$	$\Delta \log \mathbf{Y}_{t+1}$	A_t			
0.189$^{\bullet\bullet\bullet}$			OLS	0.036	
(0.072)					
0.476			IV	0.020	0.318
(0.354)					0.556
	0.368		IV	0.017	0.107
	(0.321)				0.457
		−0.34e–4	IV	0.015	0.000
		(0.98e–4)			0.433
0.289	0.214	0.01e–4	IV	0.020	0.572
(0.463)	(0.583)	(1.87e–4)			0.531
Memo: For instruments $\mathbf{Z}_t$, $\Delta \log \mathbf{C}^*_t = \mathbf{Z}_t \zeta$, $\bar{R}^2 = 0.023$; var(log(ξ_t)) = 4.16e–6					
Sticky : $\Delta \log \mathbf{C}^*_{t+1}$ (with measurement error $\mathbf{C}^*_t = \mathbf{C}_t \times \xi_t$);					
$\Delta \log \mathbf{C}^*_t$	$\Delta \log \mathbf{Y}_{t+1}$	A_t			
0.467$^{\bullet\bullet\bullet}$			OLS	0.223	
(0.061)					
0.773$^{\bullet\bullet\bullet}$			IV	0.230	0.000
(0.108)					0.542
	0.912$^{\bullet\bullet\bullet}$		IV	0.145	0.105
	(0.245)				0.187
		−0.97e–4$^{\bullet}$	IV	0.059	0.000
		(0.56e–4)			0.002
0.670$^{\bullet\bullet\bullet}$	0.171	0.12e–4	IV	0.231	0.460
(0.181)	(0.363)	(0.86e–4)			0.551
Memo: For instruments $\mathbf{Z}_t$, $\Delta \log \mathbf{C}^*_t = \mathbf{Z}_t \zeta$, $\bar{R}^2 = 0.232$; var(log(ξ_t)) = 4.16e–6					

Notes: Reported statistics are the average values for 100 samples of 200 simulated quarters each. Bullets indicate that the average sample coefficient divided by average sample standard error is outside of the inner 90%, 95%, and 99% of the standard normal distribution. Instruments $\mathbf{Z}_t = \{\Delta \log \mathbf{C}_{t-2}, \Delta \log \mathbf{C}_{t-3}, \Delta \log \mathbf{Y}_{t-2}, \Delta \log \mathbf{Y}_{t-3}, A_{t-2}, A_{t-3}, \Delta_8 \log \mathbf{C}_{t-2}, \Delta_8 \log \mathbf{Y}_{t-2}\}$.

Table 7 Aggregate Consumption Dynamics in RA Model

$$\Delta \log \mathbf{C}_{t+1} = \varsigma + \chi \Delta \log \mathbf{C}_t + \eta \mathbb{E}_t[\Delta \log \mathbf{Y}_{t+1}] + \alpha A_t + \epsilon_{t+1}$$

Expectations : Dep Var Independent Variables			OLS or IV	2nd Stage $\bar{R}^2$	KP p-val Hansen J p-val
Frictionless : $\Delta \log \mathbf{C}^*_{t+1}$ (with measurement error $\mathbf{C}^*_t = \mathbf{C}_t \times \xi_t$);					
$\Delta \log \mathbf{C}^*_t$	$\Delta \log \mathbf{Y}_{t+1}$	A_t			
−0.015			OLS	0.002	
(0.077)					
0.387			IV	0.014	0.367
(0.390)					0.570
	0.390		IV	0.016	0.084
	(0.311)				0.475
		−0.26e–4	IV	0.016	0.000
		(1.11e–4)			0.493
0.122	0.267	0.16e–4	IV	0.018	0.547
(0.519)	(0.575)	(2.12e–4)			0.572
Memo: For instruments $\mathbf{Z}_t$, $\Delta \log \mathbf{C}^*_t = \mathbf{Z}_t \zeta$, $\bar{R}^2 = 0.018$; var(log(ξ_t)) = 3.33e–6					
Sticky : $\Delta \log \mathbf{C}^*_{t+1}$ (with measurement error $\mathbf{C}^*_t = \mathbf{C}_t \times \xi_t$);					
$\Delta \log \mathbf{C}^*_t$	$\Delta \log \mathbf{Y}_{t+1}$	A_t			
0.412$^{\bullet\bullet\bullet}$			OLS	0.179	
(0.063)					
0.788$^{\bullet\bullet\bullet}$			IV	0.183	0.001
(0.138)					0.532
	0.641$^{\bullet\bullet\bullet}$		IV	0.128	0.085
	(0.163)				0.171
		−0.47e–4	IV	0.075	0.000
		(0.52e–4)			0.027
0.632$^{\bullet\bullet\bullet}$	0.118	0.10e–4	IV	0.184	0.321
(0.223)	(0.280)	(0.79e–4)			0.480
Memo: For instruments $\mathbf{Z}_t$, $\Delta \log \mathbf{C}^*_t = \mathbf{Z}_t \zeta$, $\bar{R}^2 = 0.186$; var(log(ξ_t)) = 3.33e–6					

Notes: Reported statistics are the average values for 100 samples of 200 simulated quarters each. Bullets indicate that the average sample coefficient divided by average sample standard error is outside of the inner 90%, 95%, and 99% of the standard normal distribution. Instruments $\mathbf{Z}_t = \{\Delta \log \mathbf{C}_{t-2}, \Delta \log \mathbf{C}_{t-3}, \Delta \log \mathbf{Y}_{t-2}, \Delta \log \mathbf{Y}_{t-3}, A_{t-2}, A_{t-3}, \Delta_8 \log \mathbf{C}_{t-2}, \Delta_8 \log \mathbf{Y}_{t-2}\}$.