Table 1: Benchmark Parameters

This table shows the parameters used in the benchmark quantitative exercise.

	Symbol	Value
Parameters set outside the model		
Capital share in output	α	0.4
Capital depreciation rate	δ	0.021
Growth rate of TFP	g	0.004
Quarterly discount factor	β	0.995
Entrepreneurs' risk aversion parameter	γ	2
Entrepreneurs' intertemporal elasticity of substitution		0.4
Workers' inverse Frisch elasticity	η	2
Disutility of labor	ω	23.6
Fraction of firms with investment opportunity	π	0.015
Borrowing constraint parameter	θ	0.266
Standard deviation of log productivity shock	σ_{ε_A}	0.006
Persistence of log productivity shock	ρ_z	0.95
Calibrated parameters		
Mean of liquidity shock	μ_τ	0.984
Persistence of log liquidity shock	ρ_τ	0.9795
Standard deviation of log liquidity shock	$\sigma_{\varepsilon_\tau}$	$4.6 \cdot 10^{-4}$
Correlation of innovations of log τ_t and log A_t	$\rho_{A,\tau}$	0.79

Table 2: Calibration Moments

This table reports the calibration moments.

Target	Symbol	Data	Model Mean	Model STD
Volatility of relative investment growth	$\frac{\sigma_{\Delta I}}{\sigma_{\Delta Y}}$	2.71	2.71	0.07
Volatility of relative consumption growth	$\frac{\sigma_{\Delta C}}{\sigma_{\Delta Y}}$	0.56	0.56	0.03
Volatility of risk-free rate	σ_{rf}	0.73	0.72	0.15
Mean quarterly risk-free rate	r^f	0.25	0.25	0.35

Table 3: Standard Business Cycle Statistics

This table reports the business cycle statistics for three versions of our model. Statistics are computed based on 10,000 replications of size 400 when the first 200 observations are discarded. The symbol $\sigma_{\Delta x}$ represents the standard deviation of the growth rate of variable x, $\rho_{\Delta x}$ represents the autocorrelation of the growth rateg of x, and $\rho(\Delta x, \Delta y)$ represents the correlation between growth rates of x and y. The 'Data' column reports statistics for quarterly U.S. data for the period 1964:1-2013:4. Column (1) reports statistics for the calibrated benchmark model with the financial constraint, liquidity constraint, and both liquidity and productivity shocks. Column (2) reports the statistics for a version of the model with the financial constraint, liquidity constraint, and no liquidity shocks. Column (3) reports the statistics for a version of the model with liquidity constraint but no financial constraint. Column (4) reports the statistics for a version of the model with financial constraint but no liquidity constraint. Finally, column (5) reports the statistics for a version of the model with neither financial nor liquidity constraints.

Statistic	Data	(1) With FC and LC τ stochastic A stochastic	(2) With FC and LC τ constant A stochastic	(3) LC only τ stochastic A stochastic	(4) FC only τ irrelevant A stochastic	(5) No LC, no FC τ irrelevant A stochastic
$\sigma_{\Delta Y}$	0.83	0.80	0.80	0.80	0.80	0.80
$\sigma_{\Delta I}/\sigma_{\Delta Y}$	2.71	2.71	1.15	3.69	1.28	1.42
$\sigma_{\Delta C}/\sigma_{\Delta Y}$	0.56	0.56	0.96	0.37	0.89	0.84
$\sigma_{\Delta L}/\sigma_{\Delta Y}$	0.98	0.33	0.33	0.33	0.33	0.33
$\sigma_{\Delta C^e}/\sigma_{\Delta C^w}$		1.54	0.80	3.28	0.40	0.07
$\rho_{\Delta Y}$	0.34	-0.04	-0.04	-0.03	-0.04	-0.04
$\rho_{\Delta I}$	0.39	-0.04	-0.04	-0.04	-0.04	-0.04
$\rho_{\Delta C}$	0.54	-0.02	-0.04	0.08	-0.04	-0.04
$\rho_{\Delta L}$	0.68	-0.04	-0.04	-0.03	-0.04	-0.04
$\rho(\Delta Y, \Delta I)$	0.77	0.96	1.00	0.96	1.00	1.00
$\rho(\Delta Y, \Delta C)$	0.57	0.92	1.00	0.54	1.00	1.00
$\rho(\Delta Y, \Delta L)$	0.70	1.00	1.00	1.00	1.00	1.00

Table 4: Asset Price Statistics

This table reports the business cycle statistics for three versions of our model. Statistics are computed based on 10,000 replications of size 400 when the first 200 observations are discarded. The first panel reports the means of the statistics. The symbol σ_x represents the standard deviation of variable x and $\rho(\Delta x, \Delta y)$ represents the correlation between growth rates of x and y. The returns r^e and r^f are averages over the simulated paths. The 'Data' column reports statistics for quarterly U.S. data for the period 1964:1-2013:4. Column (1) reports statistics for the calibrated benchmark model with the financial constraint, liquidity constraint, and both liquidity and productivity shocks. Column (2) reports the statistics for a version of the model with the financial constraint, liquidity constraint, and no liquidity shocks. Column (3) reports the statistics for a version of the model with liquidity constraint but no financial constraint. Column (4) reports the statistics for a version of the model with financial constraint but no liquidity constraint. Finally, column (5) reports the statistics for a version of the model with neither financial nor liquidity constraints.

Statistic	Data	(1) With FC and LC τ stochastic A stochastic	(2) With FC and LC τ constant A stochastic	(3) LC only τ stochastic A stochastic	(4) FC only τ irrelevant A stochastic	(5) No LC, no FC τ irrelevant A stochastic
r^f	0.25	0.25	0.32	0.58	1.08	1.51
r^e	1.76	1.70	1.70	2.03	1.08	1.51
$r^e - r^f$	1.52	1.46	1.38	1.45	0.01	0.00
σ_r^f	0.73	0.72	0.34	1.80	0.16	0.06
σ_{r^e}	8.68	1.56	0.66	0.09	0.73	0.06
$\rho(\Delta q, \Delta Y)$	0.25	0.96	1.00	0.00	1.00	0.00
$\rho(\Delta q, \Delta I)$	0.28	1.00	1.00	0.00	1.00	0.00

Table 5: Asset Return Cyclicalities and Asset Return Predictability

The first panel of this table reports the correlations between logged output (net off the balanced growth path) at time t and a variable of interest computed between t and $t+1$ for various versions of our model. $\mathbb{E}$ denotes the expectations and σ the standard deviation as of time t. Standard deviations of the statistics over the 10,000 simulations are reported in parantheses. The second panel of this table reports the asset return predictability for the U.S. data and various versions of our model. The data column is taken from Guvenen (2009) and contains the predictability of the log of the cumulative excess stock return by the log of the price-to-dividend ratio. Columns (1) - (5) report the predictability of the log of the cumulative excess equity return by the log of the price-to-capital return ratio. Statistics are computed based on 10,000 replications of size 400 when the first 200 observations are discarded.

Statistic	Data	(1) With FC and LC τ stochastic A stochastic	(2) With FC and LC τ constant A stochastic	(3) LC only τ stochastic A stochastic	(4) FC only τ irrelevant A stochastic	(5) No LC, no FC τ irrelevant A stochastic
Correlation with output						
$\mathbb{E}[r^e]$		-0.83	-0.95	0.02	-0.95	0.80
		(0.09)	(0.02)	(0.37)	(0.02)	(0.12)
$\mathbb{E}[r^e] - r^f$		-0.81	0.97	-0.77	-0.04	-0.01
		(0.09)	(0.01)	(0.09)	(0.32)	(0.19)
r^f		0.79	-0.96	0.75	-0.95	0.80
		(0.10)	(0.01)	(0.10)	(0.02)	(0.12)
$\sigma[\mathbb{E}[r^e] - r^f]$		-0.05	-0.04	-0.04	-0.06	0.05
		(0.28)	(0.32)	(0.27)	(0.31)	(0.31)
$\mathbb{E}[\Delta c^s]$		0.79	-0.96	0.76	-0.95	0.80
		(0.10)	(0.01)	(0.10)	(0.02)	(0.12)
$\sigma_{\Delta c^s}$		-0.39	-0.32	-0.44	0.87	0.04
		(0.37)	(0.27)	(0.19)	(0.08)	(0.31)
$\mathbb{E}[\Delta c^i]$		-0.66	0.96	-0.68	0.87	0.80
		(0.22)	(0.02)	(0.15)	(0.08)	(0.12)
$\sigma_{\Delta c^i}$		-0.48	-0.13	-0.58	0.87	0.04
		(0.31)	(0.30)	(0.17)	(0.08)	(0.31)
Excess return predictability						
1-year β	-0.22	-1.51	-1.65	1.67	-0.19	0.00
R^2	0.09	0.64	0.16	0.36	0.02	0.02
2-year β	-0.39	-2.55	-2.72	2.84	-0.38	0.00
R^2	0.14	0.71	0.16	0.31	0.03	0.03
5-year β	-0.77	-4.01	-4.14	4.83	-0.92	0.00
R^2	0.26	0.52	0.12	0.24	0.07	0.06

Table 6: Comparative Statics

This table reports the business cycle statistics for several versions of our model. Statistics are computed based on 10,000 replications of size 400 when the first 200 observations are discarded. The symbol σ_x ($\sigma_{\Delta x}$) represents the standard deviation of variable x (standard deviation of growth rate of x), ρ_x represents the autocorrelation of x, and $\rho(x, y)$ represents the correlation between x and y. The returns r^e and r^f are averages over the simulated paths. The 'Data' column reports statistics for quarterly U.S. data for the period 1964:1-2013:4. Column 'Bench' reports statistics for the benchmark version of the model with the financial constraint and both liquidity and productivity shocks. The remaning columns report the results for various comparative statics exercises, in which we change a parameter of interest.

Statistic	Data	Bench	Liquidity Constraint		Liquidity Shock		Inv. Opportunity		Financial Friction		EIS		Risk Aversion		Frisch Elasticity	
			Low τ = 0.98	High τ = 0.988	Low $\sigma_{\varepsilon_\tau}$ 0.00023	High $\sigma_{\varepsilon_\tau}$ 0.00092	Low π = 1%	High π = 2%	Low ϕ = 0.20	High ϕ = 0.33	Low = 0.3	High = 0.5	Low γ = 1.5	High γ = 2.5	Low η = 1	High η = 3
Macro variables																
$\sigma_{\Delta Y}$	0.83	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.91	0.75
$\sigma_{\Delta I}/\sigma_{\Delta Y}$	2.71	2.71	2.60	2.52	1.91	4.14	3.21	3.64	2.72	2.71	2.59	2.71	2.71	2.71	2.51	2.81
$\sigma_{\Delta C}/\sigma_{\Delta Y}$	0.56	0.56	0.63	0.60	0.75	0.49	0.53	0.37	0.58	0.55	0.60	0.56	0.56	0.56	0.61	0.55
$\sigma_{\Delta C^e}/\sigma_{\Delta C^w}$		1.54	1.52	3.33	0.50	3.55	1.51	3.19	1.38	1.70	1.36	1.55	1.54	1.54	1.27	1.67
$\rho(\Delta Y, \Delta I)$	0.77	0.96	0.97	0.94	0.98	0.93	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.97	0.96
$\rho(\Delta Y, \Delta C)$	0.57	0.92	0.96	0.89	0.99	0.34	0.89	0.57	0.93	0.91	0.94	0.92	0.92	0.92	0.95	0.91
Financial variables																
r^f	0.25	0.25	-0.22	0.71	0.31	-0.03	-1.12	0.34	-0.14	0.53	0.95	-0.30	0.25	0.26	0.25	0.25
r^e	1.76	1.70	2.12	1.31	1.70	1.73	1.19	2.03	1.54	1.87	1.71	1.70	1.70	1.70	1.71	1.70
$r^e - r^f$	1.52	1.46	2.34	0.60	1.38	1.76	2.31	1.69	1.68	1.34	0.76	2.00	1.46	1.45	1.45	1.46
σ_r^f	0.73	0.72	0.51	0.99	0.21	1.76	0.66	1.86	0.63	0.83	0.83	0.64	0.73	0.71	0.70	0.73
σ_{r^e}	8.68	1.56	1.50	1.44	1.10	2.36	1.58	0.25	1.69	1.42	1.49	1.56	1.56	1.56	1.65	1.52
$\rho(\Delta q, \Delta Y)$	0.25	0.96	0.96	0.94	0.98	0.92	0.95	0.29	0.96	0.96	0.95	0.96	0.96	0.96	0.96	0.96
$\rho(\Delta q, \Delta I)$	0.28	1.00	0.97	0.94	1.00	0.99	1.00	0.25	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00

Figure 1: Impulse Responses to a Productivity Shock

This figure shows the impulse responses to a negative productivity shock.

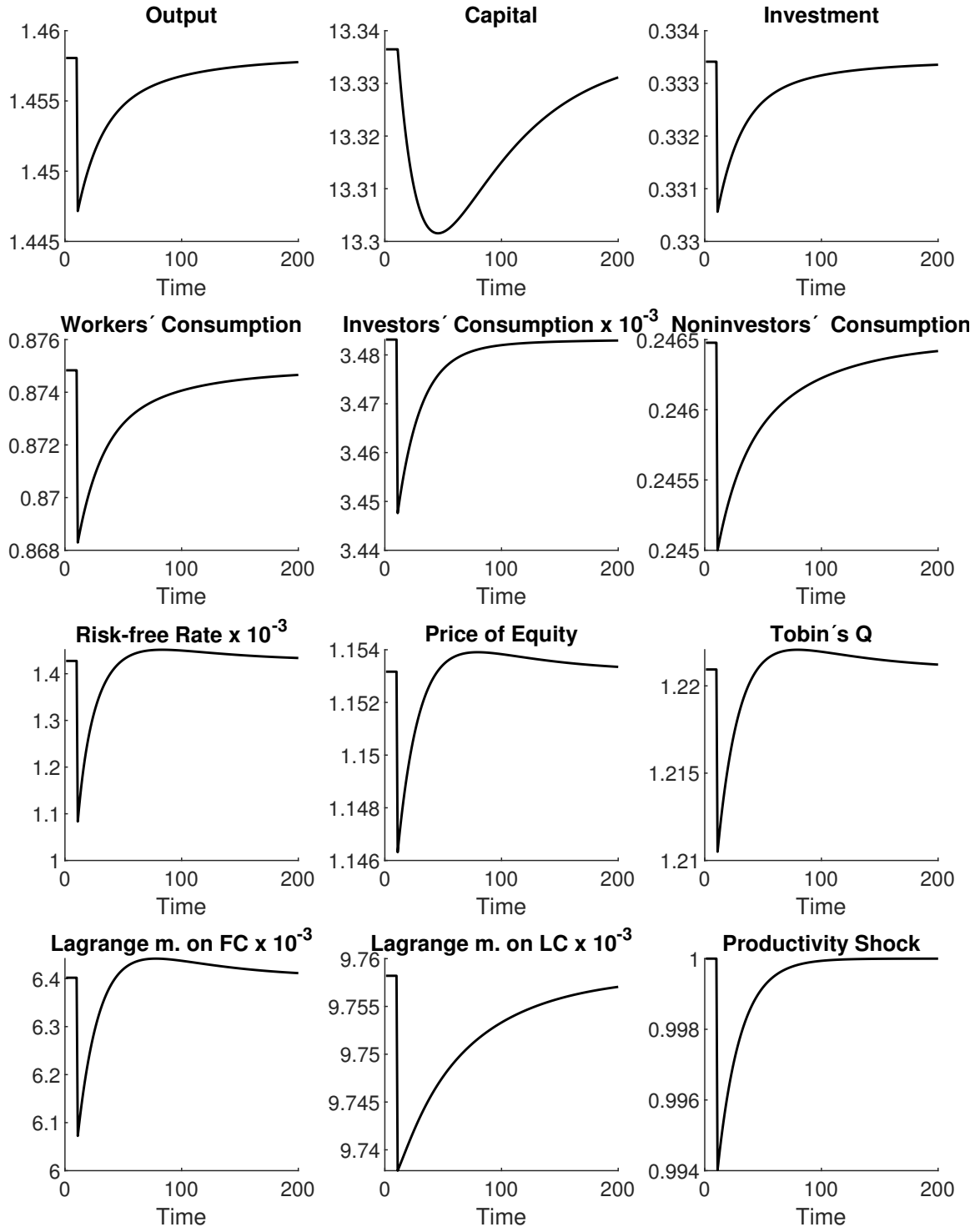

Figure 2: Impulse Responses to a Liquidity Shock

This figure shows the impulse responses to a negative liquidity shock.