

Financial Regulation in a Quantitative Model of the Modern Banking System: Tables for Reproduction

Juliane Begenau
Stanford GSB

Tim Landvoigt
Wharton

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Table 1: Calibration

Panel A: Parameters with a one-to-one mapping to the data

	Value	Description	Target
Production			
ρ_Y	0.599	Non-bank GDP autocorr.	AC(NIPA GDP - Bank dep. GDP)
σ_Y	0.87%	Non-bank GDP volatility	Vol(NIPA GDP - Bank GDP)
δ_K	2.5%	Depreciation	Quarterly depreciation NIPA
η	0.667	Labor share	NIPA labor share
σ_{ρ^C}	12.1%	SD C-bank idiosync. shocks	vol(equity payout C-banks)
σ_{ρ^S}	25.4%	SD S-bank idiosync. shocks	vol(equity payout S-banks)
Bank regulation			
θ	10%	Capital requirement	mean(Tier-1 Eq / Assets)
κ	0.142%	Deposit insurance fee	FDIC report (see table notes)
Runs			
\underline{Z}	$26\% \times Z$	Real asset foreclosure discount	?
π^R	[0, 0.333]	Fraction of households run	?
Prob_{π^R}	[0.963 0.0375]	Unconditional run probability	4.76%
	[0.75 0.25]	Average bank run length	1.3 quarters

Panel B: Parameters that jointly match moments in the data

Values	Description	Target	Data	Model
Bank technology				
ν^Z 0.23	Scales bank output	Real GDP per capita share	22.3%	22.3%
σ^Z 1.74%	Bank dep. output volatility	Vol(Bank output growth)	2.93%	3.02%
ϕ_I 0.3	Investment adj. cost	Vol(Investment)	2.65%	1.04%
ϕ_K 0.011	Capital growth adj. cost	Vol(C-bank asset growth)	0.50%	0.46%
Bank default				
δ_S 0.39	Default penalty S-banks	S-bank bond default bond default rate	0.28%	0.30%
δ_C 0.204	Default penalty C-banks	Loan net charge-offs	0.23%	0.23%
ξ_S 20.5%	Bankruptcy cost S-banks	Unsecured debt recov. Moody's	38.1%	38.2%
ξ_C 35.2%	Bankruptcy cost C-banks	Sec. debt recov. & FDIC resol. costs	48.1%	48.1%
π_B 85%	Bailout probability	Shadow bank leverage	87.0%	83.2%
Liquidity preferences				
β 0.993	Discount rate	C-bank interest rate on deposits	0.36%	0.39%
α 0.33	CES weight S-bank debt	S-bank share ?	34.0%	33.7%
ψ 0.0072	Liq. preference weight	Liq. premium BDG2019	0.21%	0.17%
γ_H 1.6	Liq. preference curvature	Reg. coefficient on AS	-0.19%	-0.14%
ϵ 0.2	Liq. type elasticity	Reg. coefficient on AC	0.50%	0.68%
Run				
$\underline{\delta}_K$ 2.5%	capital dep.	Avg. haircut ?	15.1%	15.2%

Table 3: Commercial – Shadow bank debt price spread regressions

	(1)	(2)
log(S-bank debt/GDP)	-0.19% (-1.86)	-0.14% (-1.13)
log(C-bank debt/GDP)	0.50% (1.64)	0.44% (1.45)
Federal Funds Rate	54.89% (10.02)	54.61% (10.66)
log(C/GDP)	0.57% (0.26)	-0.24% (-0.11)
VIX		-0.12% (-1.39)
adj. R2	0.77	0.78

Table 4: Properties of the dynamic model

	Data	Model
Volatility		
Consumption	0.38%	0.39%
Mkt Lev C	1.48%	0.10%
Book Lev C	0.29%	0.09%
Mkt Lev S	2.22%	3.51%
Book Lev S	3.41%	3.51%
Debt C/Debt S	0.52	0.20
Business Cycle Correlation		
Consumption	0.89	0.72
Investment	0.92	0.95
Debt S Share	0.43	0.03
Debt S (lag GDP)	0.26	0.15
Book Lev C	0.16	0.43
Mkt Lev C	-0.21	-0.42
Book Lev S	0.04	-0.00
Mkt Lev S	-0.31	-0.02
C-bank liquidity benefit	-0.26	-0.52
yield C	0.74	-0.85
yield S	0.82	-0.79
rf. rate	0.70	-0.85
spread S-C	0.51	0.12

Table 5: Effect of higher capital requirements

	Base	13%	14%	15%	16%	17%	20%	30%
Capital and Debt								
1. Capital	3.15	0.16%	0.23%	0.30%	0.38%	0.46%	0.72%	1.64%
2. Debt share S	31.95%	2.71%	3.39%	4.01%	4.61%	5.18%	6.91%	13.79%
3. Capital share S	33.68%	0.26%	0.09%	-0.15%	-0.43%	-0.73%	-1.73%	-4.79%
4. Capital S	1.06	0.42%	0.32%	0.16%	-0.05%	-0.28%	-1.02%	-3.23%
5. Leverage S	83.18%	0.18%	0.26%	0.34%	0.43%	0.52%	0.80%	1.80%
6. Leverage C	89.95%	-3.33%	-4.44%	-5.56%	-6.67%	-7.78%	-11.12%	-22.22%
7. Early Liquidation (runs)	0.00	0.25%	0.36%	0.47%	0.59%	0.72%	1.10%	2.51%
Prices								
8. Deposit rate S	0.45 %	-0.66%	-0.96%	-1.28%	-1.61%	-1.96%	-3.05%	-6.80%
9. Deposit rate C	0.39%	-3.69%	-4.86%	-6.01%	-7.17%	-8.35%	-12.04%	-26.83%
10. Convenience Yield S	0.28%	1.39%	2.00%	2.65%	3.33%	4.04%	6.26%	14.33%
11. Convenience Yield C	0.31%	4.68%	6.14%	7.60%	9.06%	10.54%	15.17%	33.97%
Welfare								
12. Default S	0.30%	3.05%	4.40%	5.85%	7.39%	9.00%	14.12%	34.08%
13. Default C	0.23%	-65.11%	-76.16%	-83.96%	-89.38%	-93.09%	-98.28%	-100.00%
14. GDP	1.29	0.01%	0.02%	0.02%	0.03%	0.03%	0.05%	0.12%
15. Liquidity Services	1.48	-2.16%	-2.85%	-3.54%	-4.22%	-4.90%	-6.96%	-14.09%
16. Consumption	1.21	0.062%	0.073%	0.081%	0.086%	0.090%	0.098%	0.107%
17. Vol(Liquidity Services)	0.03	-3.16%	-4.26%	-5.39%	-6.53%	-7.66%	-11.08%	-22.31%
18. Vol(Consumption)	0.00	0.31%	0.34%	0.36%	0.36%	0.36%	0.31%	0.07%
19. Welfare		0.0460%	0.0511%	0.0535%	0.0540%	0.0527%	0.0435%	0.0053%

Table 6: Higher capital requirements without demand effect ($\gamma_H = 0$)

	(1) C-bank Only				(2) Simple Model				(3) No Demand Effect			
	B	14	15	16%	B	14	15	16%	B	14	15	16%
	Capital and Debt											
1. Capital	3.17	-0.64%	-0.76%	-0.89%	3.20	-0.38%	-0.45%	-0.52%	3.17	-0.40%	-0.47%	-0.54%
2. Debt share S	-	-	-	-	39.73%	4.37%	5.24%	6.08%	31.75%	4.15%	4.95%	5.72%
3. Capital share S	-	-	-	-	41.83%	1.60%	1.77%	1.89%	33.41%	1.29%	1.34%	1.33%
4. Leverage S	-	-	-	-	82.47%	-0.10%	-0.12%	-0.15%	83.47%	-0.42%	-0.50%	-0.58%
5. Leverage C	89.99%	-4.44%	-5.55%	-6.66%	89.99%	-4.45%	-5.56%	-6.67%	89.94%	-4.43%	-5.54%	-6.65%
6. Early Liquidation (runs)	-	-	-	-	-	-	-	-	0.00	-0.62%	-0.73%	-0.84%
	Prices											
7. Deposit rate S	-	-	-	-	0.46%	1.92%	2.30%	2.65%	0.43%	1.69%	2.01%	2.31%
8. Deposit rate C	0.37%	0.09%	0.14%	0.22%	0.35%	-1.93%	-2.31%	-2.68%	0.38%	-1.34%	-1.60%	-1.83%
9. Convenience Yield S	-	-	-	-	0.24%	-3.76%	-4.50%	-5.21%	0.29%	-3.15%	-3.75%	-4.32%
10. Convenience Yield C	0.33%	0.20%	0.22%	0.23%	0.35%	1.94%	2.32%	2.68%	0.32%	1.58%	1.88%	2.15%
	Welfare											
11. Default S	-	-	-	-	0.01%	-4.01%	-4.81%	-5.57%	0.33%	-6.62%	-7.87%	-9.05%
12. Default C	0.23%	-76.20%	-83.97%	-89.37%	0.23%	-76.26%	-84.02%	-89.42%	0.23%	-76.14%	-83.95%	-89.38%
13. GDP	1.29	-0.05%	-0.06%	-0.07%	1.29	-0.03%	-0.03%	-0.04%	1.29	-0.03%	-0.04%	-0.04%
14. Liquidity Services	2.85	-5.06%	-6.28%	-7.50%	1.47	-3.77%	-4.64%	-5.50%	1.49	-3.72%	-4.60%	-5.48%
15. Consumption	1.21	0.10%	0.11%	0.12%	1.21	0.06%	0.07%	0.07%	1.21	0.07%	0.07%	0.08%
16. Vol(Liquidity Services)	0.06	-3.98%	-5.02%	-6.04%	0.03	-3.76%	-4.65%	-5.52%	0.05	0.43%	0.30%	0.12%
17. Vol(Consumption)	0.00	0.31%	0.27%	0.19%	0.00	0.61%	0.69%	0.76%	0.00	0.00%	0.02%	0.04%
18. Welfare		0.070%	0.071%	0.069%		0.035%	0.034%	0.031%		0.046%	0.047%	0.045%

Table 7: Parameter Sensitivity Checks

	(1) ψ		(2) α		(3) ε		(4) σ_{ρ^S}		(5) π^B	
	-25%	+25%	-25%	+25%	-25%	+25%	-5%	+5%	= 0	= .865
	Capital and Debt									
1. Capital	-2.57	2.47	-0.83	0.74	0.05	-0.05	-0.03	0.01	0.38	-0.26
2. Debt share S	4.44	-2.30	-29.89	31.32	3.03	-3.34	1.50	-1.46	-8.10	0.99
3. Capital share S	6.56	-3.90	-28.88	29.89	2.93	-3.22	0.25	-0.29	1.37	-2.38
4. Capital S	3.82	-1.52	-29.46	30.84	2.98	-3.27	0.22	-0.28	1.75	-2.60
5. Leverage S	-3.19	2.53	-0.88	0.59	0.06	-0.07	1.83	-1.70	-13.27	5.31
6. Leverage C	-0.01	-0.01	0.02	0.03	0.03	-0.01	0.00	-0.00	0.02	0.02
7. Early Liquidation (runs)	-4.18	3.49	-1.32	0.95	0.16	-0.19	1.75	-1.62	-12.77	4.95
	Prices									
8. Deposit rate S	11.75	-9.98	3.52	-2.96	-0.17	0.22	0.39	-0.19	-12.28	11.57
9. Deposit rate C	15.15	-14.01	4.47	-3.64	-0.26	0.29	0.20	-0.12	-2.44	1.53
10. Convenience Yield S	-22.49	20.50	-6.65	4.43	0.32	-0.40	-1.97	1.97	13.89	-3.07
11. Convenience Yield C	-18.71	17.48	-5.40	3.55	0.31	-0.34	-0.27	0.25	3.46	-1.97
12. Corr(Conv. Yield C,Y)	-17.29	8.75	4.24	-10.18	2.10	-2.50	-1.28	1.23	8.40	-13.82
	Welfare									
13. Default S	-43.08	50.34	-13.52	9.90	0.64	-0.81	-12.32	14.26	-94.65	169.25
14. Default C	-1.76	1.23	0.11	1.43	0.83	-0.40	0.04	-0.02	0.90	0.54
15. GDP	-0.19	0.18	-0.06	0.05	0.00	-0.00	-0.00	0.00	0.03	-0.02
16. Liquidity Services	-4.00	3.44	8.95	-4.98	-0.38	0.43	0.50	-0.48	-3.81	1.40
17. Consumption	-0.022	0.015	0.000	-0.006	-0.001	0.001	0.000	-0.001	0.031	-0.047
18. Vol(Liquidity Services)	17.82	-11.78	1.51	1.03	-0.59	0.48	2.54	-2.49	-13.33	-14.73
19. Vol(Consumption)	0.52	-0.39	-0.99	1.85	0.17	-0.13	0.07	-0.05	-0.68	5.46

Table 8: Time-varying S-bank Liquidity Preference Function

	(A1) with $\nu = 1$	(A1) with $\nu = 10$	(A2) with $\nu = 1$
Capital and Debt			
1. Capital	-0.01	-0.09	-0.02
2. Debt share S	-0.37	-3.60	-0.93
3. Capital share S	-0.36	-3.49	-0.88
4. Capital S	-0.37	-3.57	-0.90
5. Leverage S	-0.00	-0.05	-0.05
6. Leverage C	-0.00	-0.01	-0.01
7. Early Liquidation (runs)	0.01	0.07	-0.23
Prices			
8. Deposit rate S	0.03	0.35	0.08
9. Deposit rate C	0.05	0.47	0.11
10. Convenience Yield S	-0.06	-0.64	-0.14
11. Convenience Yield C	-0.06	-0.57	-0.13
12. Corr(Conv. Yield C,Y)	0.42	3.91	-2.98
Welfare			
13. Default S	-0.13	-1.38	-0.29
14. Default C	-0.10	-0.39	-0.20
15. GDP	-0.00	-0.01	-0.00
16. Liquidity Services	0.08	0.82	0.22
17. Consumption	0.000	0.001	0.000
18. Vol(Liquidity Services)	-0.07	-0.59	22.84
19. Vol(Consumption)	-0.02	-0.16	-0.05