The Effects of Macroeconomic Shocks: Household Financial Distress Matters

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Opportunity and Inclusive Growth Institute
Annual Research Conference
November 17, 2022

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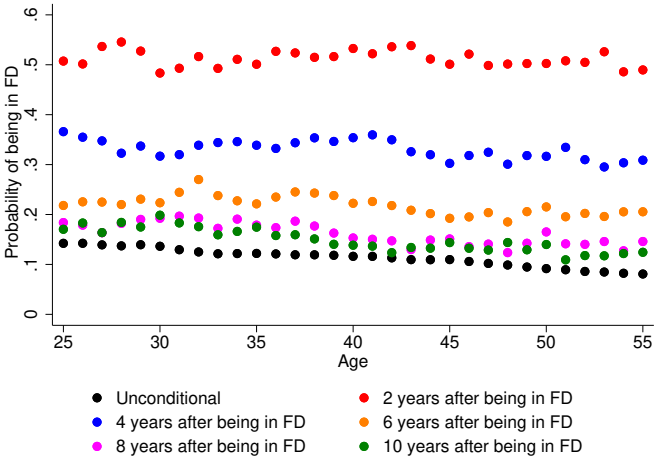
  - Prior FD is correlated with aggregate shock severity.
  - We'll show today that models with FD have different implications for consumption pass-through compared to models without it.

Why FD: it is common and persistent



Source: Athreya et al (2019).
Note: Here FD is 120+ days delinquent on unsecured debt.

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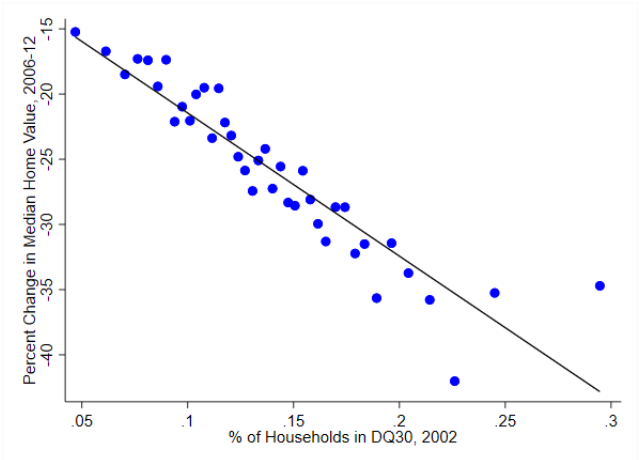
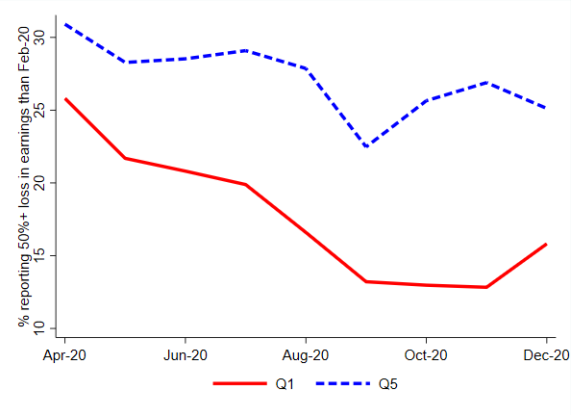
Why FD: higher FD in 2002 was associated with larger house-price declines during Great Recession



Sources: Zillow and Equifax/NY Fed CCP.

Why FD: higher FD in 2018 was associated with larger earnings losses early in the pandemic



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- In part, reflects positive relationship between FD and higher *pre-pandemic* employment shares in leisure & hospitality.

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- Model disease transmission during CV-19 pandemic.
  - Earnings shock experiments should be viewed more generically.
- Model fiscal or monetary policy.
  - Not trying to account for observed change in consumption following these shocks. Rather, want to understand (via counterfactuals) how the response of consumption depends on FD.

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- The correlation channel is unimportant for these results.

Model description

The model: basic ingredients

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  - Differences in β_j help match persistence of FD and wealth distribution.
  - Differences in h_j^R help match homeownership by FD.

The model: homeownership

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- Allow for mortgage default:
  - Competitive risk-neutral lenders price mortgages as: $q^m_{j,n}(h', m', y, a')$.

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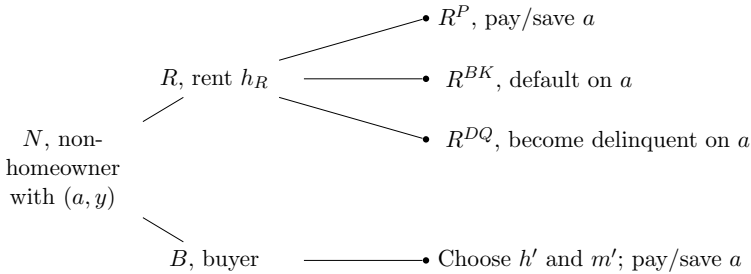
- If agents choose BK, they pay a filing fee f and enter tomorrow with $a' = 0$.
- Competitive risk-neutral lenders price unsecured debt as: $q^a_{j,n}(h', m', y, a')$.

The model: non-homeowner's choices



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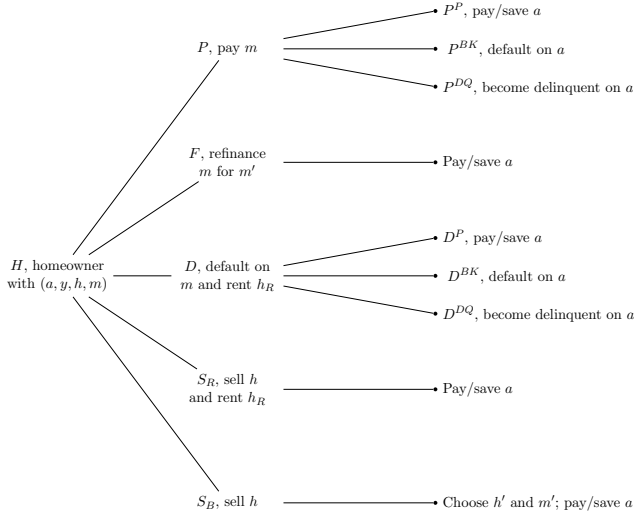

Model estimation and aggregate shock calibration

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- Estimate model for each quintile to replicate dispersion of FD across U.S.
  - Estimate a few parameters (s_L, h_L^R, η) to match statistics on wealth, homeownership, and incidence and persistence of FD for each quintile.
  - Set other parameters externally and equal across quintiles (e.g. $\beta_H = 1, \beta_L = 0.8$ following Athreya et al 2019.)

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  - Set other parameters externally and equal across quintiles (e.g. $\beta_H = 1, \beta_L = 0.8$ following Athreya et al 2019.)
- Key take-aways: model implies significant parameter differences across quintiles. Also generates reasonable MPCs out of earnings and house-price shocks.

▸ Targets ▸ Estimates ▸ Model MPCs

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- Key take-away: for both types of shocks we replicate that severity increases with FD.

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  - *Amplification role of FD*: how much more/less does consumption change when allowing for FD versus not?
  - *Accounting for FD*: what feature of the model with FD is crucial?

- For all exercises we consider three measures of consumption responses:
  - change in p90/p10 of consumption distribution
  - change in consumption-based poverty (e.g. Cutler and Katz 1991, Meyer and Sullivan 2019)
  - change in aggregate consumption

Main results: amplification

- Compare responses of baseline model with a *simplified* heterogeneous agent life cycle model with housing, but no FD.
  - no borrowing ($a' \geq 0$), so no DQ or BK
  - no ex-ante heterogeneity, so $\beta = \beta_j$ and $h^R = h^R_j$ for all j
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- Calibrate this model to match wealth and homeownership of Q3.

When house prices fall, poverty and inequality *fall* in the baseline model, but *not* in the simple model

	Baseline model (1)	Simple model (2)	Amplification (1)-(2)
Change in consumption p90/p10 ratio	-4.45	0.95	-5.40
Change in consumption-based poverty	-1.71	2.46	-4.18

Notes: All values are percentage points of steady-state value. These are average changes over three periods following the housing shock.

- There is a tight relationship between FD and homeownership in the baseline model:
  - Low FD individuals own homes, lose home equity, so p90 falls.
  - High FD individuals don't own homes, benefit from affordability, so p10 rises.

When house prices fall, aggregate consumption *contracts more* in the baseline model with FD

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Change in aggregate consumption following house-price shock	-1.78	-1.08	-0.69

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- Conditional on owning a home, being in FD makes it harder to insulate consumption from house-price declines.

When earnings decline, poverty and inequality increase *more* in the baseline model with FD

	Baseline model (1)	Simple model (2)	Amplification (1)-(2)
Change in consumption p90/p10 ratio	14.92	2.64	12.28
Change in consumption-based poverty	17.11	8.29	8.82

Notes: All values are percentage points of steady-state value. The change is measured only in the period of the earnings shock and is calculated over the working-age population.

- Again reflects reduced capacity to smooth consumption when in FD compared to model w/o FD.

When earnings decline, the drop in aggregate consumption is also larger in the baseline model with FD

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Change in consumption p90/p10 ratio	14.92	2.64	12.28
Change in consumption-based poverty	17.11	8.29	8.82
Change in aggregate consumption following earnings shock	-3.35	-1.47	-1.88

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The *direct channel* of FD accounts for most of the amplification of house-price shocks...

	Direct	Indirect	Correlation
Change in consumption p90/p10 ratio	108.83	-7.55	-1.28
Change in consumption-based poverty	83.21	18.33	-1.54
Change in aggregate consumption	88.91	19.57	-8.47

Notes: Each number is a ratio relative to the total amplification of the full model.

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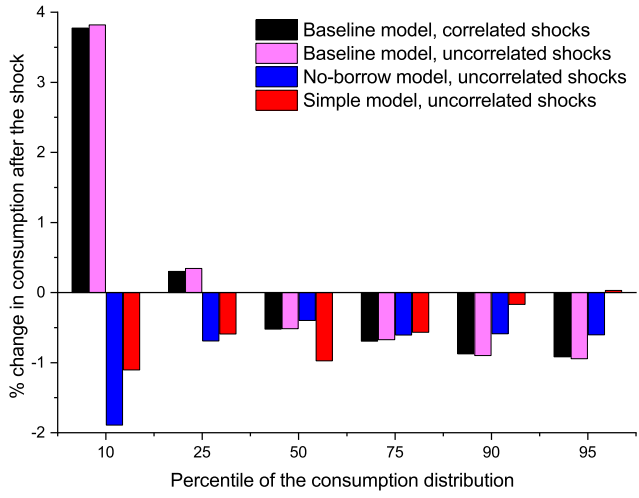

The indirect channel of FD accounts for most of the amplification of earnings shocks...

	Direct	Indirect	Correlation
Change in consumption p90/p10 ratio	-24.55	112.05	12.50
Change in consumption-based poverty	0.01	91.96	8.04
Change in aggregate consumption	14.17	81.13	4.70

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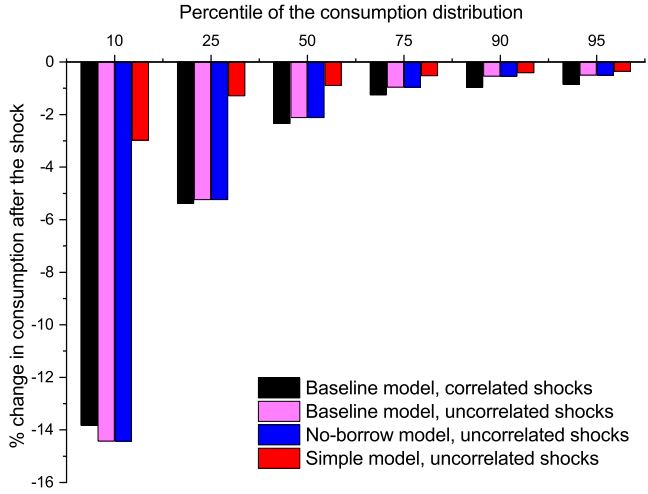

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- Using a structural model, we find that FD matters for the transmission of shocks into individual and aggregate consumption:
  - With FD consumption inequality and poverty *fall* when house prices decline. Without FD they *rise*.

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- Using a structural model, we find that FD matters for the transmission of shocks into individual and aggregate consumption:
  - With FD consumption inequality and poverty *fall* when house prices decline. Without FD they *rise*.
  - With FD consumption responds *more* when earnings decline compared to model w/o FD.

Conclusions

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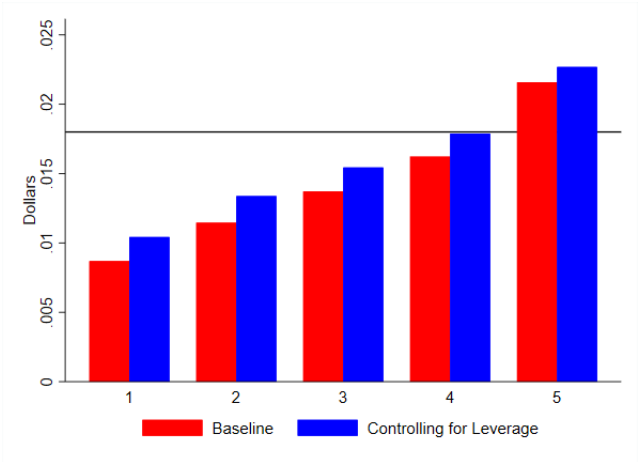
  - With FD consumption inequality and poverty *fall* when house prices decline. Without FD they *rise*.
  - With FD consumption responds *more* when earnings decline compared to model w/o FD.
  - *Modeling and matching* FD drives these results. The *correlation* of FD with aggregate shocks matters less.

Thanks!

Why FD: higher FD is associated with larger MPCs out of house price shocks



Note: The horizontal line is the estimate at the zip code level by Mian, Rao, and Sufi (2013).

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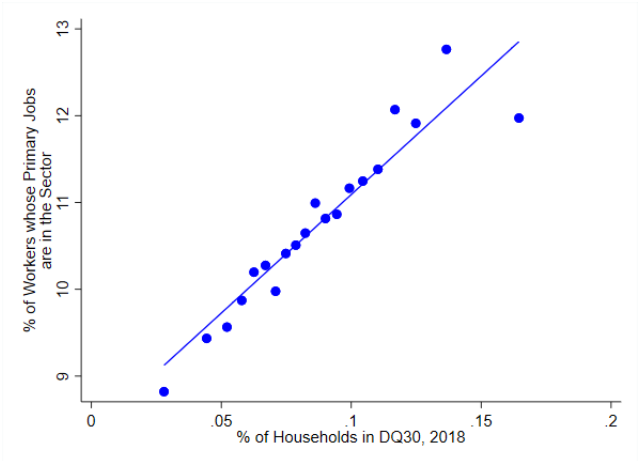
...this was likely related to higher employment shares in Leisure & hospitality



Sources: Census LODES and Equifax/NY Fed CCP.

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Model fit by FD quintile

	Q1 (lowest FD)		Q2		Q3		Q4		Q5 (highest FD)	
	Data	Model	Data	Model	Data	Model	Data	Model	Data	Model
Savings/Inc	2.44	1.71	1.96	1.50	1.78	1.36	1.57	1.23	1.06	1.03
Homeownership*	76.3	76.1	71.9	67.8	68.8	62.4	64.2	61.6	61.7	52.8
Housing debt> 0"| FD	33.3	35.1	30.7	22.8	28.4	21.0	26.9	27.4	26.0	20.9
Mortg def rate*	1.52	1.41	1.81	1.63	2.24	2.13	2.58	2.21	3.34	2.49
DQ rate*	8.98	9.64	12.6	13.2	15.4	15.9	18.3	18.5	23.9	22.2
BK rate*	0.39	0.43	0.55	0.58	0.63	0.58	0.65	0.70	0.64	0.65
Persistence of FD:										
Over 2 yrs	9.2	5.15	8.05	5.38	6.82	4.73	5.89	4.07	4.83	3.62
Over 4 yrs	6.15	4.34	5.36	4.16	4.57	3.65	3.99	3.18	3.2	2.80
Over 8 yrs	3.89	4.43	3.56	3.95	2.95	3.48	2.61	3.01	2.19	2.62
Over 10 yrs	3.4	3.83	3.00	3.69	2.66	3.17	2.37	2.84	2.05	2.47
SSE	0.90		0.71		0.57		0.38		0.35	

Notes: ∗ in percent. SSE is the sum of squared errors for each quintile. "Savings/Income" represents mean net financial wealth divided by mean income, and "With housing debt / In FD" is the percent of the population with housing debt, conditional on being in FD.

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Parameter estimates by quintile of FD

Parameter	Q1 (lowest FD)	Q2	Q3	Q4	Q5 (highest FD)
Share of L-types	0.297	0.385	0.442	0.497	0.575
s_L	(0.081)	(0.057)	(0.054)	(0.046)	(0.042)
Size of rental for L-types	4.500	4.362	3.943	2.988	2.985
h_L^R	(0.016)	(0.036)	(0.028)	(0.035)	(0.039)
Discharge rate of DQ debt	0.449	0.294	0.277	0.244	0.244
η	(0.009)	(0.004)	(0.003)	(0.004)	(0.003)

Notes: Asymptotic standard errors appear in parentheses.

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Model generates reasonable MPCs out of housing and income shocks

	Aggregate	Q1 (lowest FD)	Q5 (highest FD)
Out of house-price shocks (homeowners only)	0.087	0.081	0.095
Out of income shocks	0.308	0.239	0.385

- Model-implied MPC out of house-price shocks is in range of Mian, Rao, and Sufi (2013) and Aladangady (2017).
- Model-implied MPC out of transitory earnings shocks is similar to Sahm, Shapiro, and Slemrod (2010), Coronado, Lupton, and Sheiner (2005) and Jappelli and Pistaferri (2006).
- MPCs out of earnings shocks rising with FD is related to Parker (2017): *"the majority of lack of consumption smoothing is predicted by a simple measure that can be interpreted as impatience."*

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Calibration of house-price and earnings shocks

FD Quintile	Average decline in house prices	Percent of population with earnings loss of: 0%	25%	50%	Average earnings loss
1	7.0	80.3	5.3	14.4	8.5
2	8.6	79.3	5.6	15.1	9.0
3	10.0	78.2	5.1	16.7	9.6
4	10.9	76.5	5.9	17.6	10.3
5	11.5	72.4	5.9	21.7	12.3

Sources: Zillow, Bick and Blandin (2021), and authors' calculations.

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