Default Risk and Aggregate Fluctuations in an Economy with Production Heterogeneity

Khan, Senga and Thomas

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Heterogeneity and Aggregate Dynamics Session
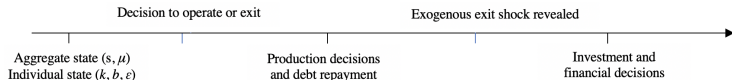International Society for Inventory Research - ASSA Annual Meeting

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The Big Picture

▶ Goal: quantify the real effects of a financial shock.

▶ Propose a new model of (only) financial frictions with

1. endogenous borrowing constraints $\Rightarrow$ defaultable debt.
2. firm dynamics $\Rightarrow$ firms that choose to default, exit.

▶ This improves the previous description of the Great Financial Crisis.

▶ Heterogenous effects of the financial shock
   * Smaller and younger firms fare worse because they face higher borrowing costs in equilibrium.

▶ The extensive margin adds more gradualism.
   * Slowly unfolding recession followed by a slow recovery.

KEY MECHANISM

Decision to operate or exit

Exogenous exit shock revealed

Aggregate state (s, μ)
Individual state (k, b, ε)

Production decisions
and debt repayment

Investment and
financial decisions

- ▶ Perfect competition among financial intermediaries + defaultable debt $\Rightarrow$ int rate on loans depends on default prob.

- ▶ Three types of firms in equilibrium: impervious, exposed of type I and exposed of type II.

- ▶ Investment decisions of exposed type II firms are distorted: traditional intensive misallocation.

- ▶ Firm exit leaves capital idle: new extensive misallocation.

- ▶ A credit shock that involves (i) fall in default recovery rate & (ii) higher financial fixed costs.

  - ✓ $\downarrow$ recovery & $\uparrow$ expected default $\Rightarrow$ $\uparrow$ borrowing costs.
  - ✓ More exposed type II firms & more exit.

IMPLICATIONS OF MICRO-LEVEL CALIBRATION

- ▶ In calibration, there is a trade-off between fitting: age-size distribution v.s. skewness of unconditional size distribution.

- ▶ Assume a share of firms are *special* i.e. have very high productivity draws.
    - * This generates a long-thin right tail in size distribution.
    - * But these firms grow big quickly and dominate every cohort.
    - * Thus, average firm no longer has a maturing phase.

- ▶ Trade-off matters because chosen weights affects model response to credit shock.

- ▶ Absent firms in the maturing phase, incumbent misallocation is small.

- ▶ Thus, model relies more heavily on the extensive margin to generate aggregate effects of credit shock.

Potential candidates:

1. Heterogeneous and hump-shape real effects of credit shocks.

2. Implications of micro-level calibration

Potential candidates:

1. Heterogeneous and hump-shape real effects of credit shocks.

   ▶ Clementi and Palazzo (2013): entry & exit increase persistence of aggregate shocks.

   ▶ No heterogeneity in quantitative analysis!

   How much are smaller, younger firms contracting relative to their bigger, older counterparts?

   Compare model results to Khan and Thomas (2009), Almeida et al (2009) and other empirical GFC evidence.

2. Implications of micro-level calibration

Potential candidates:

1. Heterogeneous and hump-shape real effects of credit shocks.

2. Implications of micro-level calibration.

   ▶ Trade-off is not intrinsic to the model but results from calibration strategy.

   ▶ Not only matching weights used differ, but the distribution of productivity and the definition of a credit shock vary too.

   ▶ Quantitative results do not imply much of a difference in effects of a credit shock.

   ▶ Why is the unconditional size distribution important here?

OTHER COMMENTS

1. Nature of the credit shock.

   - ▶ Two parts: (i) fall in default recovery rate and (ii) higher financial fixed costs.
   - ▶ Is (ii) a good description of GFC driver? Is it a financial shock *per se*?
   - ▶ (ii) depends on profit to even the incidence of the shock across firm size. Why?

     How far does the reduction in the default rate take us?

2. Extensive margin misallocation & no free entry.

   - ▶ An endogenous number of potential entrants should reduce the extensive margin misallocation.

3. What if default does not imply firm exit?

   - ▶ Bornstein and Castillo-Martinez (2021): relationship between default and exit varies over the business cycle.

Minor suggestions

▶ The description of entrants' problem is missing from section 3 (only appears later when calibrating).

▶ In the spirit of Table 4, it would be interesting to quantify both types of misallocation as the credit shock evolves.

▶ Regarding Table 1,

  * It should either be $\omega_n = 1.000$ or $\omega_s = 0.000$.
  * The notation of π_0^ϵ is very confusing.

Summing Up

▶ Endogeneizing borrowing constraints is key in generating heterogenous effects of credit shocks.

▶ Ideally, we would like to learn exactly **how much** heterogeneity can be generated!

▶ Looking forward to next version.