Discussion of: "Sovereign Default Risk and Firm Heterogeneity"

Cristina Arellano, Yan Bai, Luigi Bocola

Christian Hellwig
Toulouse School of Economics

Overview

- ***Big picture question:***

  Are sovereign debt crises a cause or a reflection of worsening private sector fundamentals?

- Build and quantify model with two-way feedback:
  - Private sector credit conditions → Output → Sovereign Default Incentives
  - Sovereign Default Spreads → Private sector credit conditions
- Paper makes two interesting points about such feedbacks, one about each side of the feedback loop.
- Main comments: Not sure the two points belong together

The model

- ***Small open economy: sovereign default as real options problem (Eaton and Gersovitz 1981, Arellano 2008)***

- Endogenize domestic output as function of credit conditions

- Aggregate conditions summarized by: Y=Y(Q,A)
  - Output as a function of aggregate productivity A, sovereign bond price Q

- Government budget constraint: $B + G \leq T\left(Y\right) + Q \cdot B'$

- Bond price: $Q = Q\left(B', Y, v\right)$
  - Market prices expected default risk (function of B', Y, "default inclination" v)

The model

- Aggregate conditions: Y=Y(Q,A)

- Derived from micro-foundations:

  - Investment determined from individual firms' working capital constraints
  - Imperfect pass-through from sovereign spreads to private credit spreads
  - Pass-through parameter γ>0

- Higher sovereign spread, lower Q:

  - Higher private credit rates
  - Working capital more expensive, firms invest, produce less
  - Effect more pronounced for firms with higher working capital requirements
  - Implications: $\frac{\partial y^i}{\partial Q} > 0, \frac{\partial y^i}{\partial lev^i} < 0, \frac{\partial^2 y^i}{\partial lev^i \partial Q} > 0$

The model

- ***Result I: Quantifying pass-through of sovereign spreads***
- Key idea: identify cross-partial via inter-action effect in panel data regression
- Italian firm data, regress sales growth on spreads, leverage, spreads*leverage
- Finding: A calibrated model matches Italian experience very well!
  - Match Italian sovereign default spreads 2007-2012 via shocks v
  - Set γ s.t. model-based regression coefficient matches actual panel regression
- Then model fully accounts output drop in Italy during this period (ca. 14%).
- Decomposition: at least 50% due to pass-through of sovereign risk!

The model

- ***Result II: Inspecting the feedback mechanism***

- Q decreasing in Y, and Y decreasing in Q → amplification and self-fulfilling crisis?? → NOT SO FAST!!

- Invert bond price function: $B' = B'\left(Q, Y, v\right)$

- Substitute into gov't BC:

$$B + G \leq T\left(Y\left(Q\right)\right) + Q \cdot B'\left(Q, Y\left(Q\right), v\right)$$

- Feedback from Q to Y tightens government budget constraint

- Reduces borrowing incentives, optimal to choose higher value of Q, slows down debt accumulation.

- Interpretation: "Austerity" as rational response to doom loops

Main Comment:

The two results are orthogonal to each other!

- Conditional on matching spreads, pass-through results do not require any stance on how sovereign debt dynamics, default incentives are modeled

- Shocks v serve as residual to close default side of model (Interpretation: political will to repay debt, market sentiments, contagion, sunspots,…)

- Delayed propagation result only relies on having some aggregate relation Y(Q), not on its exact micro-foundations, i.e. interaction with leverage and private credit conditions

Focus further comments on the quantitative results about pass-through

Comments:

- ***Great to have a quantitative model that accounts for Italian experience…***

- Model explanation for Italy passes intuitive "smell test":
  - External shocks to sovereign spreads
  - Pass through to domestic economy
  - Matches informal policy discussions, interpretations ca. 2012 extremely well ("Contagion")

- Model calibrated to the right country:
  - "external shocks" story doesn't really fit well with any other country (financial booms/busts in Spain/Ireland, fiscal sustainability crisis in Greece)

Comments (ctd):

What the model doesn't address:

- Explain why there is sovereign pass-through (reduced-form relation)
- Explain why spreads went up in the first place (matched via exog. shocks), government default incentives
- Observed debt levels… difficult to match in Arellano framework
- Model matches aggregate experience 2007-2012 by calibrating to micro data 2007-2012… is success a surprise?
- Recovery after 2012… paper would be much more striking, if mechanism could also account for recovery period (Draghi: "whatever it takes…")
- Decompose the channels for output drops: cross-sectional factor misallocation (lower measured productivity) vs. aggregate labor/investment distortions

Comments (ctd):

Identification of pass-through:

- Model: Private and sovereign credit spreads price expected default losses… Data: *credit spread puzzle* (spreads >> default losses)… amplifies pass-through
- *Asset pricing:* accounting for corporate spreads requires "default" states with large aggregate default waves… implies large correlated default risk
  - Challenge: how to separate country default risk from firm-specific default risk
- Model abstracts from firm dynamics, banking, balance sheet effects, firm net worth, endogenous leverage etc.
- No endogenous propagation!
- Data: concern for endogeneity and selection on unobservables

Conclusion

Very interesting to have quantitative model to account for Italian experience, consistent with popular contagion story

Model probably not a good fit for other European countries

Methodological issues with identification of pass-through, but great to have a first attempt on which to build!