Discussion of "Sovereign Default: The Role of Expectations" by Navarro, Nicolini and Teles

Vivian Z. Yue[1]

Emory University and Federal Reserve Bank of Atlanta

December 2014

[1] DISCLAIMER: The views expressed are solely the responsibility of the authors and should not be interpreted as reflecting the views of the Atlanta Federal Reserve Bank or of anyone else associated with the Federal Reserve System.

Motivation

- Sovereign debt is subject to self-fulfilling fears of default.
  - Doubt about debt sustainability

$$\begin{array}{ccc}
\boxed{\text{Fears of default}} & \Longrightarrow & \boxed{\text{Higher interest rates}} \\
\Uparrow & & \Downarrow \\
\boxed{\text{Insolvency}} & \Longleftarrow & \boxed{\text{Faster debt accumulation}}
\end{array}$$

Motivation

- Sovereign debt is subject to self-fulfilling fears of default.
  - Doubt about debt sustainability

$$\begin{tikzcd} \boxed{\text{Fears of default}} \arrow[r, Rightarrow] & \boxed{\text{Higher interest rates}} \arrow[d, Rightarrow] \\ \boxed{\text{Insolvency}} \arrow[u, Rightarrow] & \boxed{\text{Faster debt accumulation}} \arrow[l, Rightarrow] \end{tikzcd}$$

  - What circumstances or policies leave sovereign borrowers at the mercy of self-fulfilling crises?

Motivation

- Sovereign debt is subject to self-fulfilling fears of default.
  - Doubt about debt sustainability

$$
\begin{tikzcd}
\boxed{\text{Fears of default}} \arrow[r, Rightarrow] & \boxed{\text{Higher interest rates}} \arrow[d, Rightarrow] \\
\boxed{\text{Insolvency}} \arrow[u, Rightarrow] & \boxed{\text{Faster debt accumulation}} \arrow[l, Rightarrow]
\end{tikzcd}
$$

  - What circumstances or policies leave sovereign borrowers at the mercy of self-fulfilling crises?
- The recent debt and interest rate dynamics for Italy, Spain and Portugal
  - Dramatic increase in interest rates on sovereign bonds, yet not default
  - Justification for the OMT bond-purchasing program

This Paper's Contribution

- Explore multiple equilibria in a model with default driven by insolvency
- Study the role of fundamentals and expectations in driving debt crises
- Investigate what affect the possibility of a debt crisis

Self-fulfilling Crises

- Literature: Rollover crisis
    - A switch to pessimistic expectations triggers a run and leads immediate default
    - Cole and Kehoe (2000), Conesa and Kehoe (2012), Aguiar et al (2013).

Self-fulfilling Crises

- Literature: Rollover crisis
  - A switch to pessimistic expectations triggers a run and leads immediate default
  - Cole and Kehoe (2000), Conesa and Kehoe (2012), Aguiar et al (2013).
- Calvo (1988) examines the feedback between interest rates and debt burden.
  - Multiple equilibrium driven by expectations
  - Corsetti and Dedola (2011), Corsetti and Dedola (2013) study the European crisis

Self-fulfilling Crises

- Literature: Rollover crisis
  - A switch to pessimistic expectations triggers a run and leads immediate default
  - Cole and Kehoe (2000), Conesa and Kehoe (2012), Aguiar et al (2013).
- Calvo (1988) examines the feedback between interest rates and debt burden.
  - Multiple equilibrium driven by expectations
  - Corsetti and Dedola (2011), Corsetti and Dedola (2013) study the European crisis
- Lorenzoni and Werning (2014) analyze a dynamic version of Calvo's model with exogenous public deficits.
  - Existence of multiple equilibria is affected by the fiscal policy rule, the maturity of debt, and the level of debt
  - Provides a microfoundation for the timing assumption

Key Features of Model

- Timing and action assumptions:
  - The creditors move first and offer limited funds at some interest rate.
  - The borrower is price taker.
  - Size of the bond at maturity is endogenous to bond prices.
  - Most of the sovereign debt literature (E&G (1981), A&G (2006), Arellano (2008)) assume the borrower moves first and chooses the debt level at maturity.

Key Features of Model

- Timing and action assumptions:
  - The creditors move first and offer limited funds at some interest rate.
  - The borrower is price taker.
  - Size of the bond at maturity is endogenous to bond prices.
  - Most of the sovereign debt literature (E&G (1981), A&G (2006), Arellano (2008)) assume the borrower moves first and chooses the debt level at maturity.
- Consider bimodal distributions of the endowment with good and bad times
  - Both low and high rate equilibria are robust equilibria
  - Dynamics of interest rates and debt evolve from low rate to high rate equilibrium

A Simple Two-Period Model

- Borrower chooses current debt b, given interest rate R
  - Default if $y - bR \leq 1$
  - Supply of debt given by

$$R^* = R\left[1 - F\left(1 + bR\right)\right]$$

  - An increase in b reduces the repayment prob and thus the bond price.
  - There are multiple equilibrium paths

A Simple Two-Period Model

- Borrower chooses current debt b, given interest rate R
  - Default if $y - bR \leq 1$
  - Supply of debt given by

$$R^* = R\left[1 - F\left(1 + bR\right)\right]$$

  - An increase in b reduces the repayment prob and thus the bond price.
  - There are multiple equilibrium paths
- Compare with Arellano (2008)
  - Default if $y - d \leq 1$ and supply of debt given by $R^* = R\left[1 - F\left(1 + d\right)\right]$

Main Results

- There are multiple intersections of the demand and supply curve
- A continuum of interest rate schedules in equilibria
- High rate equilibria are fragile to refinements under standard distribution of the endowment
- Multiple robust equilibria under bimodal distribution of the endowment

Comment 1: Timing Assumption

- Timing assumption
  - The investors first bid
  - The government decides how much to issue at the lowest bid. Pick the market value of debt
  - Different from Arellano: government decides the value of debt at maturity and adjusts its short run financing needs.

Comment 1: Timing Assumption

- Timing assumption
  - The investors first bid
  - The government decides how much to issue at the lowest bid. Pick the market value of debt
  - Different from Arellano: government decides the value of debt at maturity and adjusts its short run financing needs.

- Microfoundation for the timing assumption (Lorenzoni and Werning 2014)
  - The government cannot commit to the issuance of bond
  - Alternative: a game where the government can run multiple rounds of bond issuance
  - Plausible length of a time period

Comment 1: Timing Assumption

- Timing assumption
  - The investors first bid
  - The government decides how much to issue at the lowest bid. Pick the market value of debt
  - Different from Arellano: government decides the value of debt at maturity and adjusts its short run financing needs.

- Microfoundation for the timing assumption (Lorenzoni and Werning 2014)
  - The government cannot commit to the issuance of bond
  - Alternative: a game where the government can run multiple rounds of bond issuance
  - Plausible length of a time period

- Pecuniary externality associated with decentralized borrowing: Jeske (2006), Wright (2006), Uribe (2006), Kim and Zhang (2012)
  - Individual agents fail to internalize the impacts of their individual borrowing on credit costs.

Comment 2: Implication on Policy Intervention

- Effective policy
  - Policy can be effective in selecting the low rate equilibrium
  - Effective even if there are multiple robust equilibria

Comment 2: Implication on Policy Intervention

- Effective policy
  - Policy can be effective in selecting the low rate equilibrium
  - Effective even if there are multiple robust equilibria

- Design of the policy intervention
  - Deep pocket agent offers to lend to the country at policy rate R^P at any amount below $b^{\max}$

$$R^{debt} = \min\left\{R^P, R_1, R_2, \dots\right\}$$

  - Only effective and costless if $R^P > R_1$ and small enough.

Comment 2: Implication on Policy Intervention

- Effective policy
  - Policy can be effective in selecting the low rate equilibrium
  - Effective even if there are multiple robust equilibria

- Design of the policy intervention
  - Deep pocket agent offers to lend to the country at policy rate R^P at any amount below $b^{\max}$

$$R^{debt} = \min \left\{ R^P, R_1, R_2, ... \right\}$$

  - Only effective and costless if $R^P > R_1$ and small enough.

- Multiplicity plays out in the early phase of a crisis
  - Needs for early policy intervention

Comment 3: Challenge to Quantify the Mechanism

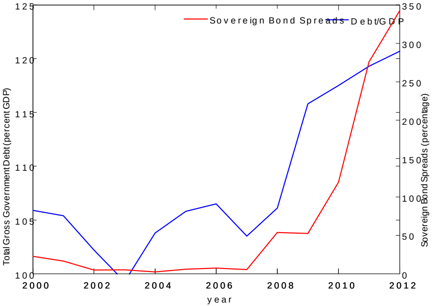
- Robust multiple equilibria under the bimodal distribution of endowment
  - Empirical relevance of the assumption on the distribution of endowment
  - The probability of expectation-driven crisis

Comment 3: Challenge to Quantify the Mechanism

- Robust multiple equilibria under the bimodal distribution of endowment
  - Empirical relevance of the assumption on the distribution of endowment
  - The probability of expectation-driven crisis
- With a positive debt recovery, the equilibrium is unique for a low level of debt
  - Lorenzoni and Werning (2014) show that the long-term debt introduces an coordination problem for the present and future creditors.
  - Robust multiple equilibrium even with positive debt recovery

Comment 3: Challenge to Quantify the Mechanism

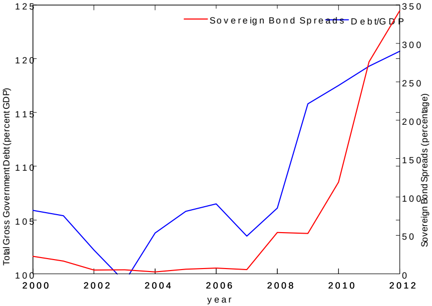
- The case of Italy



- Difficult to explain the rich dynamics of debt and spread.

Comment 3: Challenge to Quantify the Mechanism

- The case of Italy



- Difficult to explain the rich dynamics of debt and spread.
  - Equilibrium path either converges to the low-debt steady state or diverges to ever growing debt.
  - Challenge to map into the data when multiple equilibria possible

Conclusion

- A nice paper that clearly illustrates the role of expectations in sovereign default.
- An important topic that should be explored in multiple papers