

# ECB-CSF-EINAUDI: ROMA

Discussion of “Systemic Risk  
Taking: Amplification Effects,  
Externalities and Regulatory  
Responses”, by A Korinek

# Main Ingredients of Setting

- Risk-Neutral Entrepreneurs, Externally Projects with Stochastic Returns Over Two Periods, with (re)Investment Needs
- Risk-averse Investors/Consumers with Lower Ability to Generate Investment Returns from Assets Bought ex Interim
- Only Future Asset Values Pledgeable for Repayments on External Financing

# Key Observation: Externality

- Flows from Arnott, Greenwald, Stiglitz “Funding/Incentive Constraints Based on Endogenous Prices lead to Price-taking Outcomes that are Constrained Inefficient”; a special case of Incomplete Markets and Constrained Sub-optimality
- Here, since Entrepreneurs Can’t Borrow in the second period, without pledgable

# Arising from Asset Fire-Sales

- If the first-period Output is Low, then to finance Interim Reinvestment and repay first-period Claims, they must Liquidate part of their Assets, to Investors if such Shocks are Systematic across Assets
- Investors' (Shadow) Returns on These Acquired Assets are Downward Sloping
- Social Value of Interim Liquidity > Private

# Leading to Excessive Debt

- Given this, and the Differences in Risk-Aversion across Entrepreneurs/Banks and Investors, there is Excessive Use of Debt Financing at the Ex Ante Stage; in other words, Social Planner would pay less to Financiers in Low Output states, with lower Recourse to Asset Sales
- Echoes Lorenzoni (08) Over-investment

# Implications for Regulation etc

- Anticipated Revenue-neutral Transfers to/ from Entrepreneurs in Interim Date States are Fully Ineffective for Choices
- Entrepreneurs Less Likely to Raise ex interim Equity, than the Social Planner
- Fire-sales Externalities May Spread via Asset Prices, or via (exogenously given) Contingent Credit Lines, across Assets

# Pigouvian externality taxes

- Correspond to Differences between the Private and Social Shadow Prices for Liquidity, State by Interim State, and
- Ex ante Issuance of State-Contingent Repayment Claims should be Taxed as a state-price-weighted Sum of These Differences across States, to Mitigate Excessive Systemic Risk-Generation

# So Far OK: Too Broad-Brush?

- Ability of Government to Tax Investors' second-period earnings to fund interim liquidity-provision appears to be absent, unlike in Holmstrom-Tirole (JPE, 1998)
- Any Tradeoff between such Ex Ante vs Interim Taxation, for Funding Incentives
- Uniform Responses to Banks and the "Shadow Banking Sector" Institutions?



# Need More Differentiation?

- Contagion Model Rudimentary, without a Sequential Aspect, cf Diamond and Rajan (JF, 2005) and Bhattacharya et al (ET, 2007), in which inter-bank markets function feature full “myopic rationality”
- Do aspects of “Shadow Banking” funds, such as focus on Relative Performance, drive dysfunctional leverage behavior

# Toward Implementable Model

- One More Incomplete Market Pecuniary Externality Model (Bhattacharya & Gale, 1987) or More? What key analytical role is played by shocks being systemic vis-a-vis directions of sub-optimality/policy?
- Empirically, Do Levered Agents Herd on ALL dimensions (cf FX or CDS markets)
- How to Compute Optimal Regulations?

# Discussion of Hart & Zingales

“A New Capital Regulation for  
Large Financial Intermediaries”,  
by Sudipto Bhattacharya, LSE

# GOAL: Avoid LFI Insolvency

- Vis-à-vis its “systemic obligations”; bank Deposits, Inter-bank Loans, Derivatives
- While “Preserving Incentive Effects of Bankruptcy”: Penalizing the Incumbent Managers and Shareholders; Avoiding “Gambling for Resurrection” Risk-taking
- In the presence of Asset Values which are Not Observed well by Regulators

# Margin Calls and CDS Cues

- Layer of long-term Debt junior to system relevant LFI liabilities, used to Trigger
- Capital Injection Demands whenever a CDS Market Spread on these Develops
- For Enough New Equity to Make Sure of Repayment on Both sets of Liabilities
- Ex Ante Application Limits Leverage

# Further Institutional Details

- Prior to a Margin/Equity Call, Regulator carries out “Stress Test” to detect false alarms, and if convinced of certain bank solvency, commits some public money
- LFI’s Inability to Raise sufficient Equity leads to Management Replacement, a Full Write-down of Equity Value, AND imposes a Haircut on Junior Debt Claim

# Model: Two Period Evolution

- Two Interim (information) States, which lead in turn to terminal asset values in  $\{V1, V2\}$  or  $\{V3, V4\}$  respectively, with  $V1 > V2 > V3 > V4$ , with Binomial P's
- Insider Managers Can Steal a fraction  $f$  of Asset Values that are Not Paid Out to Debt Claimants, as per their Contracts
- Thus, Limiting Debt Raises Their Payoff

# Main Results: On Debt Levels

- The Maximum Initial level of Long-Term Debt which is consistent with LFI Equity holders Agreeing (weakly) to Issue New Equity in the bad interim state to keep it Risk Free, is  $D = [V4 + P3(1-f)(V3-V4)]$
- Regulatory Intervention will Occur, Off-equilibrium in this (worse) Interim State, only if  $(D-V4)$  New Equity is Not Issued



# Some Comments on Result

- In the spirit of Contingent Capital Issue proposed also by others, like Kashyap, Rajan and Stein (2008), and Flannery earlier but with weird incentive features
- To Obtain either strict preference for the New Equity Issue, or Cyclically sensitive CDS triggers, a Dynamic Consistency Issue May Arise, it would seem to me

# “Gambling for Resurrection”

- Under the CDS trigger mechanism, NO new Investment with Negative NPV will be made by Managers Utilizing Senior Debt and Equity Financing at an Interim State, when interim states are known to both Creditors and LFI Share holders
- Problematic when Rights Issues can be made to Uninformed Shareholders too?

# Short- versus Long-Term Debt

- As long as  $f > 0$ , there is no short-term debt level higher than the long-term  $D^*$  derived above, which can be rolled over using a mixture of debt and new equity at each interim date cum state; then
- WHY do different types of LFI's exhibit VERY different levels and pro-cyclicality of their leverage ratios (Adrian & Shin)

# Quite Clever Paper, However..

- Differentiation across Different Types of LFI's Not accomplished, vis-a-vis Leverage Ratios
- Equilibrium Coincidence of the Optimal Equity Issue Choices, and Risk-shifting, across LFI's and their Regulators, depend on no Info Lags
- Integration with Realistic Calibrational Models of Equity Commitments, and of Intervention Triggers (e.g., Bhattacharya, Planck, Strobl, Zechner, JEDC 2002) is rather Desirable too.