Market Procyclicality and Systemic Risk
Interplay of Procyclical Capital Requirements and Market Liquidity

Intro
After the recent U.S. financial crisis (2007-2009) a debate has developed regarding the appropriate policy instruments to use to mitigate the procyclical effects arising from the interplay between leverage and mark-to-market asset valuation.

Research Question
The Table of Market Procyclicality. How the risk of systemic default depends on the interaction between: (1) level of bank compliance with capital requirements ($\epsilon$) and (2) asset market liquidity ($1/\gamma$), in the presence of an unexpected common price shock.

Methods
We combine a balance sheet approach with a dynamic stochastic framework:

We derive an accounting rule whereby banks sell or buy external assets in response to price movements:

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Balance sheet $t=0$ Balance sheet $t=1$ Balance sheet $t=2$
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Prices have a stochastic dynamics with returns influenced by bank-trades. The combination of: balance-sheet management and the price response generates a positive feedback loop between leverage and prices that may amplify the effects of common shocks into a spiral of asset price devaluation or over-valuation.

Leverage-Price Cycle

$t=0$ The leverage $\phi(0)$ is set equal to the target level $\phi^*$;

$t=1$ The perturbation of the system with an initial aggregate price shock deviates $\phi(0)$ from $\phi^*$.

$t \geq 1$ Banks react by buying assets if the shock is positive and by selling assets if the shock is negative ($\Rightarrow$ re-sizing of banks’ balance sheets);

$t > 1$ The probability of systemic default is analyzed in critical regions of the table of market procyclicality.

Results
(1) A strong compliance with capital requirements, usually alleged to be procyclical, does not increase systemic risk unless the asset market is illiquid. (2) When the asset market is illiquid, even a weak compliance with capital requirements increases significantly systemic risk.

Conclusions
Policy makers should employ macro-prudential supervisory risk assessment policies in coordination with monetary policies to compensate for the effect of market-wide liquidity in the presence of aggregate shocks.

References