



EUROPEAN CENTRAL BANK

EUROSYSTEM

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**D-Monetary Policy**

# **Discussion of “Risk-Taking Dynamics and Financial Stability” by Anton Korinek and Martin Nowak**

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26 April 2016

*\*The views expressed are my own and do not necessarily represent the ones of the ECB or the Eurosystem of Central Banks*

# Overview

- **The paper intends to bring a new perspective on risk taking and financial sector composition**

Inspired from evolutionary economics

Focus on dynamic compositional effects

Complementary approach to more “static” risk-taking frictions related to fire sales, demand externalities or bounded rationality

- **The insights from the paper could be applied to a variety of extensions**

The paper may well open a full research programme

But some flagship applications should be conducted

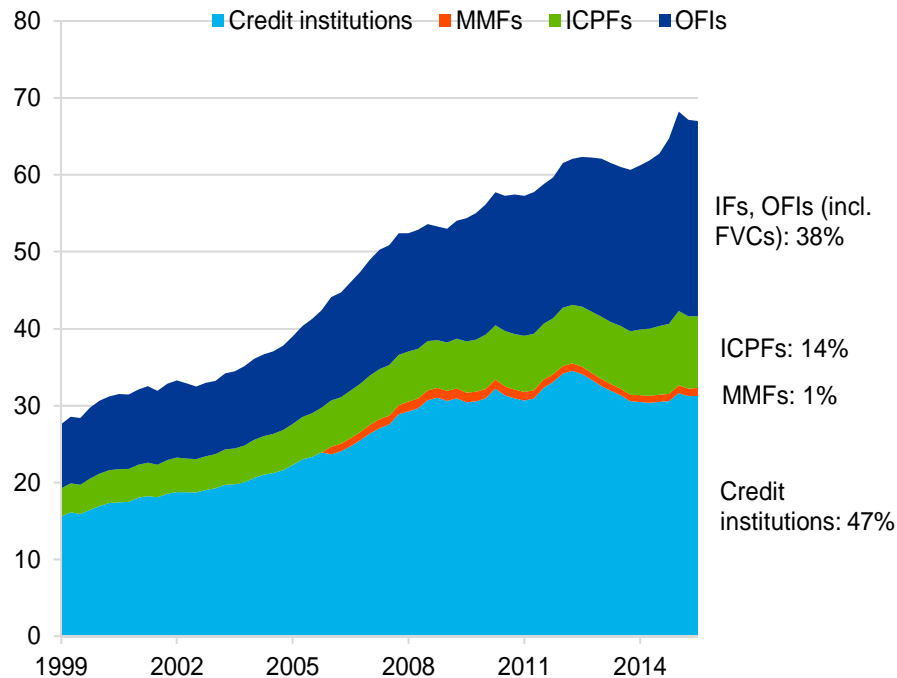
- **Which policy lessons to draw from the paper?**

The composition of the financial sector and its dynamic evolution should be monitored and at times, counteracted

Difficult to earmark the paper findings to specific policy frameworks

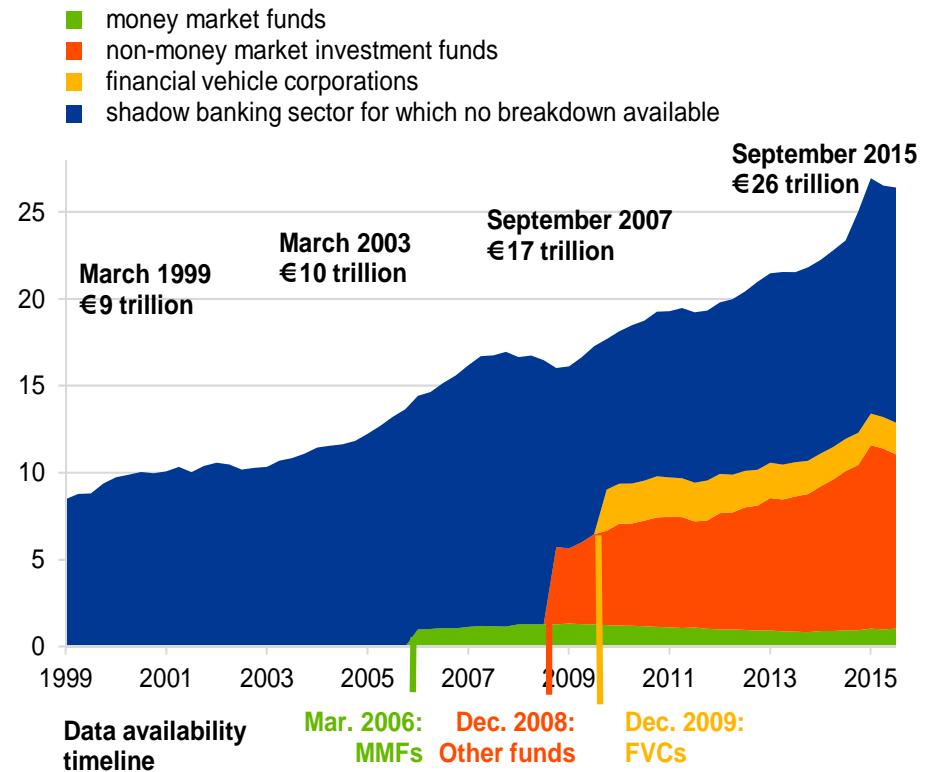
# Heterogeneity in the euro area financial system

**Euro area total financial system assets**  
(Q1 1999 to Q3 2015; EUR trillions)



Sources: ECB and ECB calculations. See Doyle, Hermans, Molitor and Weistroffer (2016), ECB Occasional paper forthcoming.

**Euro area shadow banking assets**  
(Q1 1999 to Q3 2015; EUR trillions)



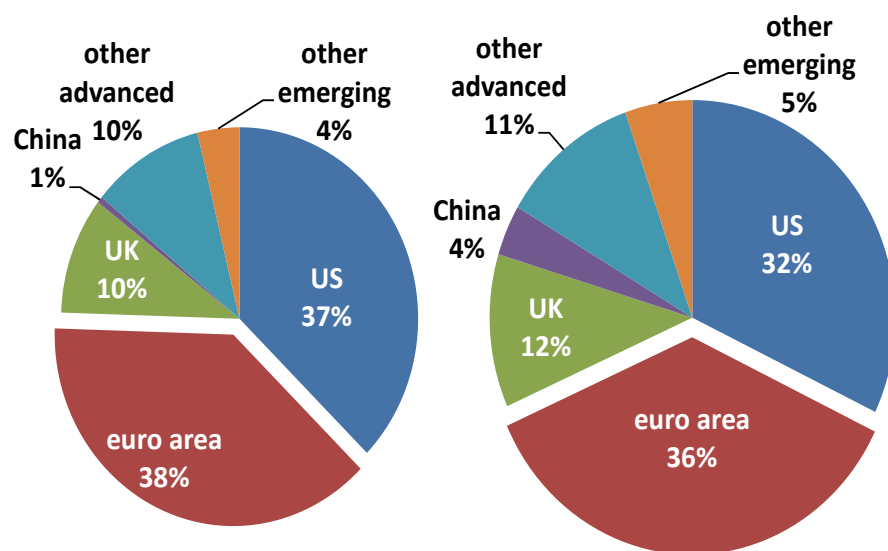
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# Global expansion of the shadow banking sector

## FSB global OFI assets by region

2007: USD 67tr

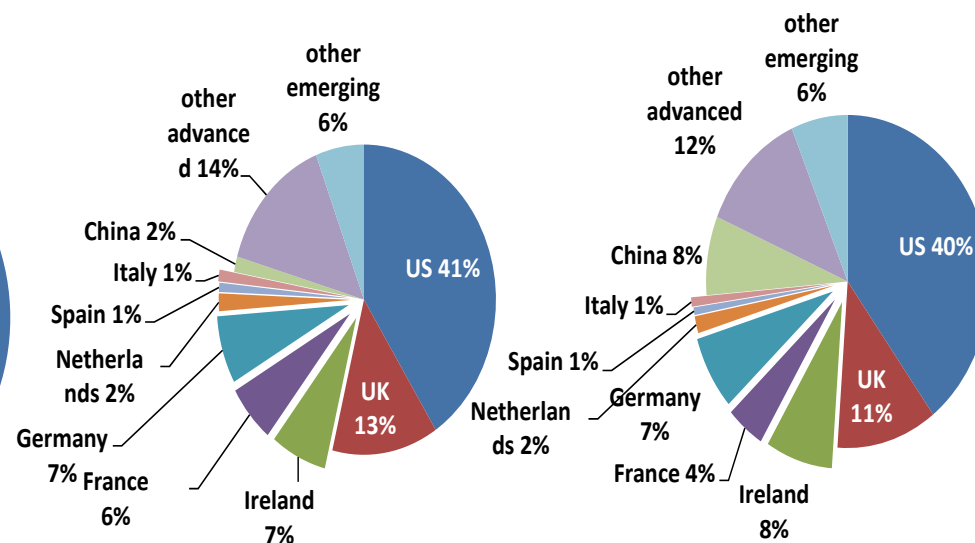
2014: USD 80tr



## FSB shadow banking assets by region

2010: USD 31tr

2014: USD 36tr



Sources: FSB and ECB calculations. See Doyle, Hermans, Molitor and Weistroffer (2016), ECB Occasional paper forthcoming.

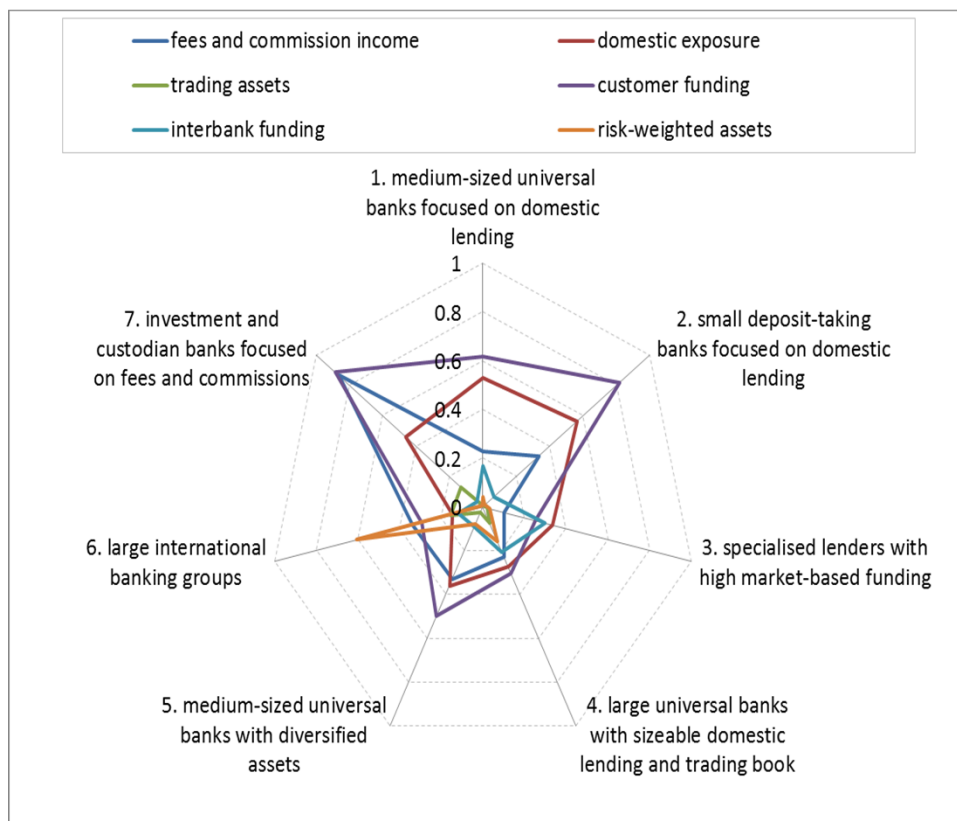
Note: "OFIs" by the FSB definition include all financial institutions that are not classified as banks, insurance companies, pension funds, public financial institutions, central banks, or financial auxiliaries. According to FSB definitions, OFIs include money-market funds, finance companies, structured finance vehicles, hedge funds, other funds, broker-dealers, real-estate investment trusts and funds, and additional sectors.

Sources: FSB and ECB calculations. See Doyle, Hermans, Molitor and Weistroffer (2016), ECB Occasional paper forthcoming.

Note: The FSB shadow banking measure cannot be calculated for the euro area as a whole as only six euro area jurisdictions participate in the data gathering exercise. These six euro area countries represent 22.5% (USD 8.1tr) of global shadow banking assets, covering the five FSB members France, Germany, Italy, the Netherlands and Spain, plus Ireland.

# Heterogeneity in the euro area financial system

## Balance sheet structure of different business models (2014; ratios and shares in %)

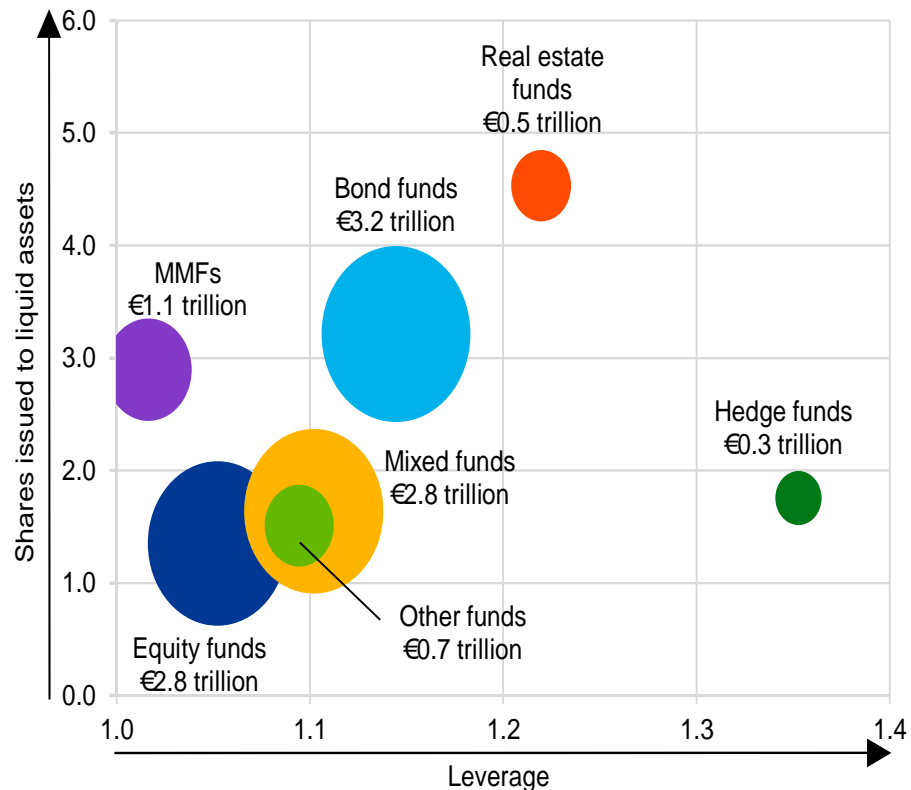


Sources: Bankscope, Bloomberg, SNL and ECB calculations. See Franch and Żochowski (2016), ECB mimeo.

Note: The chart shows the median of variables used for the identification of clusters for each of the seven clusters identified for the year 2014.

## Total assets, liquidity mismatch and leverage multiplier by type of fund (data as of Q4-2015)

(data as of Q4-2015)



Sources: ECB and ECB calculations. See Doyle, Hermans, Molitor and Weistroffer (2016), ECB Occasional paper forthcoming.

**Bubble size:** total assets in EUR tr

**x-axis:** Leverage (total assets / shares and units issued)

**y-axis:** Liquidity mismatch (shares and units issued / liquid assets)

Note: Liquid assets include equity shares, EA government bonds, and other debt securities with an original maturity smaller than 1 year.

## A model of heterogeneous “bankers”

- **“Bankers” types allocate capital to different investment strategies (independent across time)**

**Core assumption:** imperfect risk sharing across “bankers”

“bankers” maximise the log of their terminal wealth, i.e. the expected geometric mean return

Evolutionary dynamics: only bankers with maximum expected geometric mean return survive, but they differ w.r.t the variance of their investment strategy

All investment strategies are perfectly correlated with the aggregate shock

- **Optimal capital allocation implies constant capital shares across types  $\kappa^*$**

The planner solves a static portfolio problem and delivers the maximum growth in the aggregate capital stock

- **Conversely, the decentralised equilibrium displays pro-cyclicality and higher volatility**

“Boom-bust” feature of the model: successive good aggregate shocks reallocate capital towards the riskier “bankers”, leaving the overall economy more exposed to adverse shocks when they finally come.

# Transition matrix across risk types

- **Economic interpretation:**

1. Idiosyncratic shocks to the set of investment opportunities of “bankers”
2. Changes in the set of financial institutions that are operative
3. Reallocations of funds by external investors

- **Optimal transition matrix is time-invariant and implements the optimal static capital allocation  $\kappa^*$ .**

Policy should lean against inefficient boom-bust dynamics

- **Symmetric and non-state dependent transition matrix.**

Compared to the allocation without idiosyncratic shocks, a symmetric matrix brings some improvements when the distribution of capital across types is “distant enough” from the optimal one

- **State-dependent transition matrix: momentum *versus* contrarian.**

1. Starting from  $\kappa^*$ , a contrarian matrix exists which preserves the optimal allocation.
2. For capital allocation “not extremely far from the optimal one”, contrarian reallocations lower volatility

## Adding a real economy block to the model

- **“Bankers” aggregate capital is rented out to producers**

Cobb-Douglas production function out of capital and labour; producers operate under perfect competition; their output serves consumption and future capital (which fully depreciates)

- **Degenerated household sector**

Households provide inelastic labour supply; do not have access to financial market; extract some utility from log wage income

- **Optimal capital allocation still implies constant capital shares across types  $\kappa^*$**

This is true whether the planner maximises “bankers”, workers or aggregate welfare.

- **In the decentralised equilibrium, aggregate capital dynamics is now bounded but the allocation of capital across types is unchanged**

Decreasing returns and perfect substitution across capital types in the production function are key assumptions

- **The social planner achieves lower volatility and higher expected log levels for capital, output and wages**



# Policy interventions

## **1. Policy measures restricting the set of available investment strategies of bankers**

1. Introducing a cap on the volatility of investment returns
2. Introducing a cap on the asset growth of risk types

## **Those measures mainly yield benefits from their dynamic effects on the composition of the financial system**

Leaning against the “boom-bust” features of the model

## **2. Bailout policies from workers to “bankers”**

Scope for voluntary bailouts

## **Uniform lump-sum transfers may prove distortive even if bankers incentives are unaffected**

They interfere with the evolutionary selection dynamics

They may also go against the optimal capital allocation

## Discussion points

- **Who are actually the “Bankers”?**

Productive capital or bank net worth: economic or financial risk-taking

Heterogeneity in the corporate sector or in the financial system

Types of heterogeneity in the financial system: shadow banking versus traditional banking?  
Incomplete risk sharing within a monetary union?

- **How to model the spillovers to the real economy?**

Which production function?

Non-monotonic link between risk taking and TFP; endogenous growth features

More sophisticated households: saving behaviour and portfolio decisions

- **How to interpret policy interventions?**

Macroprudential policy

Monetary policy

Fiscal policy

Financial services policy

Competition or industrial policy

How to combine the dynamic compositional effects of this paper with more micro-founded heterogeneity in bank strategies?

# Shadow and Traditional banking in general equilibrium

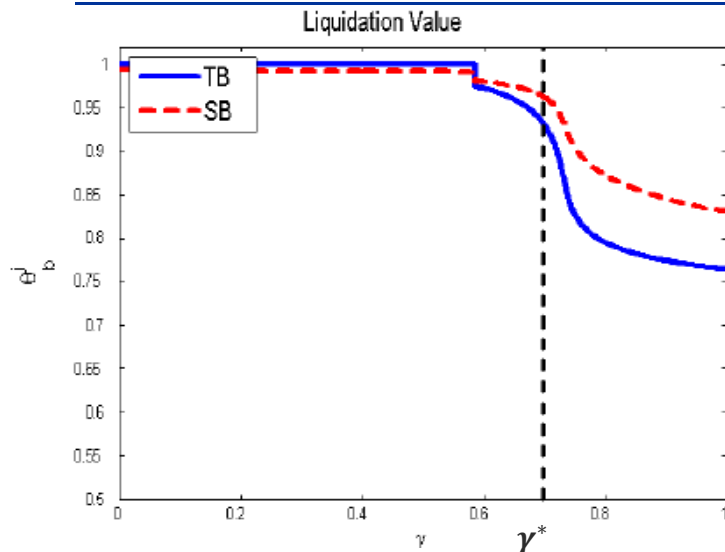
## A General Equilibrium model with endogenous fire-sales and bank-runs exploring the systemic relevance of shadow banks\*

- 3-period model with three assets: one ST liquid asset, two LT assets (safe and risky)
- Two types of bank runs: news driven *versus* panic driven
- Two equilibrium banking strategies with relative size determined by a free entry condition (in the spirit of Hanson et al (2014))
  - Shadow banking (SB) with high leverage and greater risk-taking, subject to news-driven bank runs
  - Traditional banking (TB) build more conservative portfolios to avert news-driven bank runs but remain exposed to panic (or self-fulfilling) runs
- SB and TB interactions in secondary markets for LT assets with the possibility of fire sales

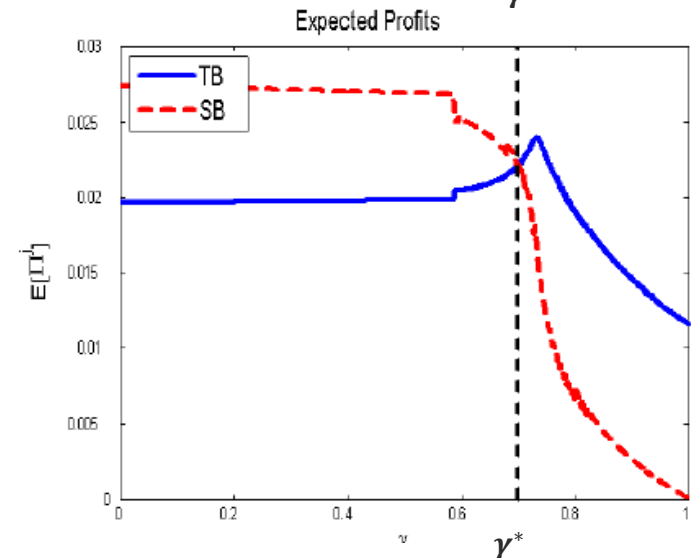
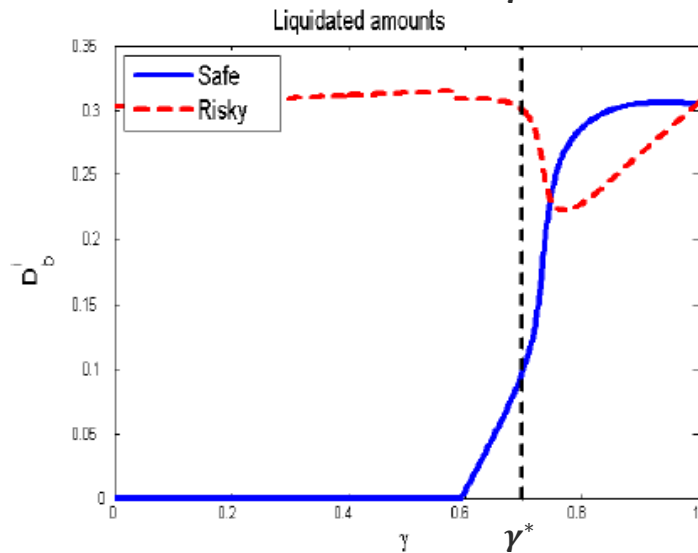
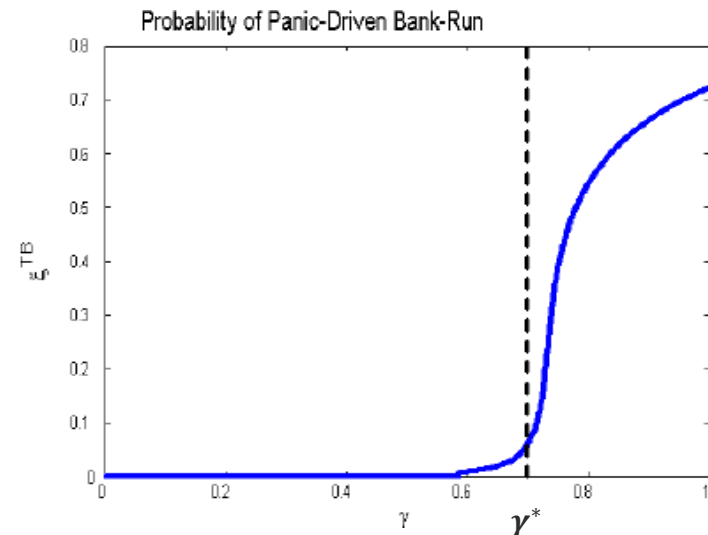
\*See Ari, Darracq Pariès, Kok and Zochowski (2016) “Shadow Banking in General Equilibrium” ECB working paper forthcoming

# Shadow and Traditional banking in general equilibrium

Model solutions after bad news revelations for different values of the shadow banking sector size  $\gamma \in [0, 1]$



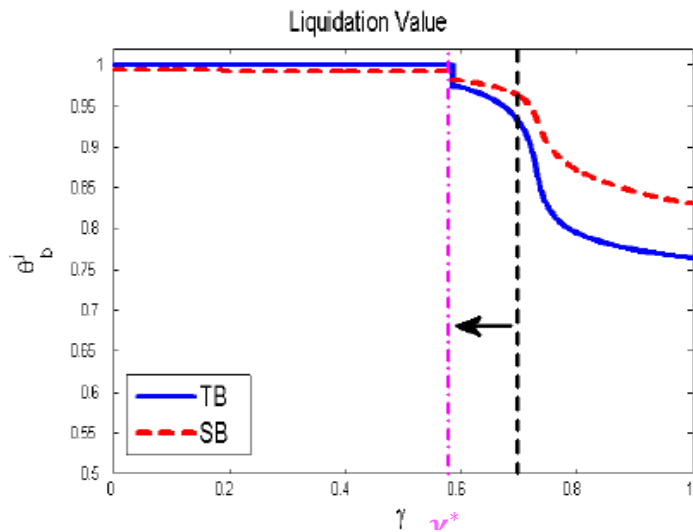
Optimal shadow banking sector size  $\gamma^*$



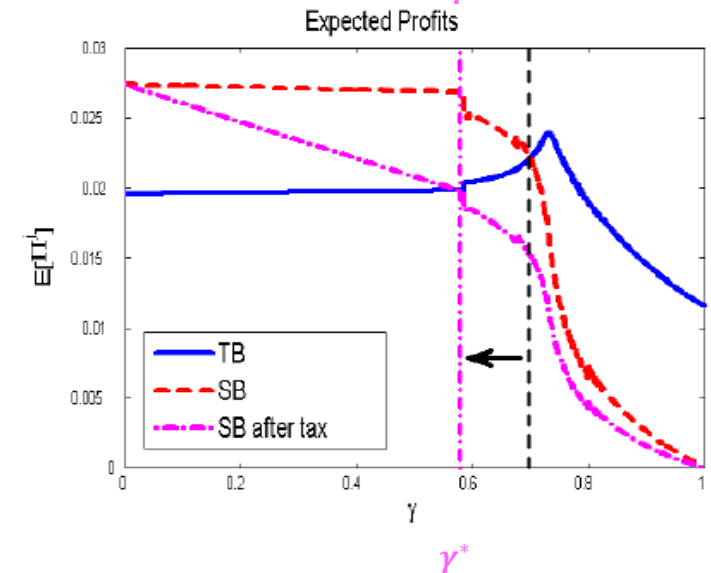
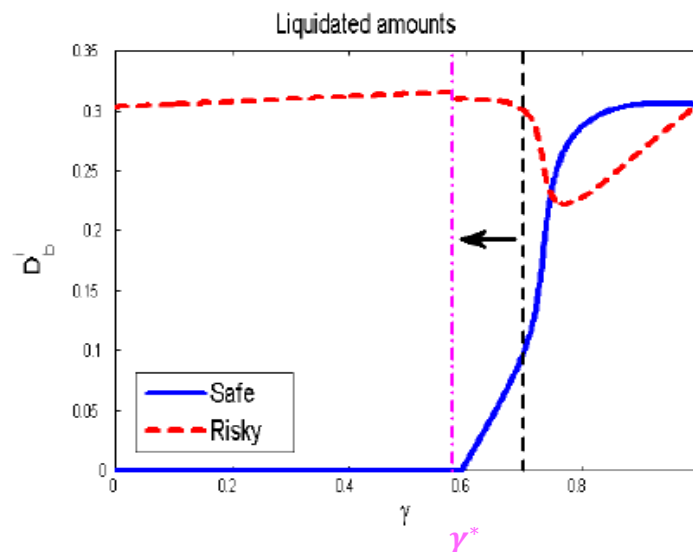
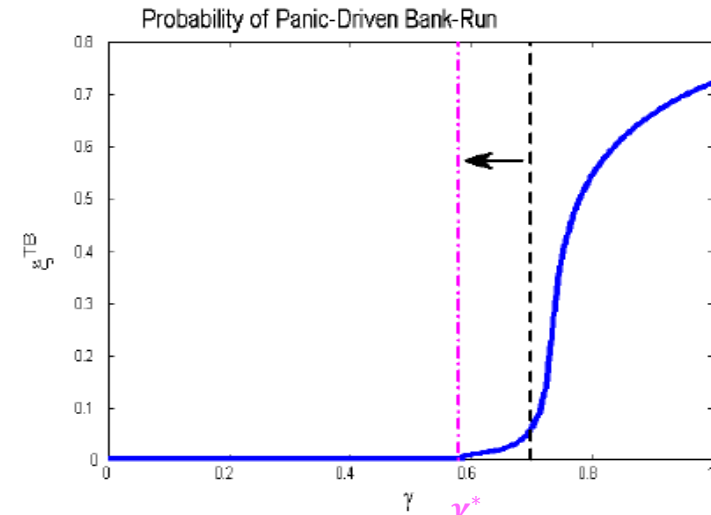
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# Taxing shadow banks

Model solutions after bad news revelations for different values of the shadow banking sector size  $\gamma \in [0, 1]$



Optimal shadow banking sector size with tax  $\gamma^*$



\*See Ari, Darracq Pariès, Kok and Zochowski (2016) "Shadow Banking in General Equilibrium" ECB working paper forthcoming

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