BIRMINGHAM
BUSINESS
SCHOOL

UNIVERSITÀ DEGLI STUDI
DI GENOVA

'Triple-crown' accredited

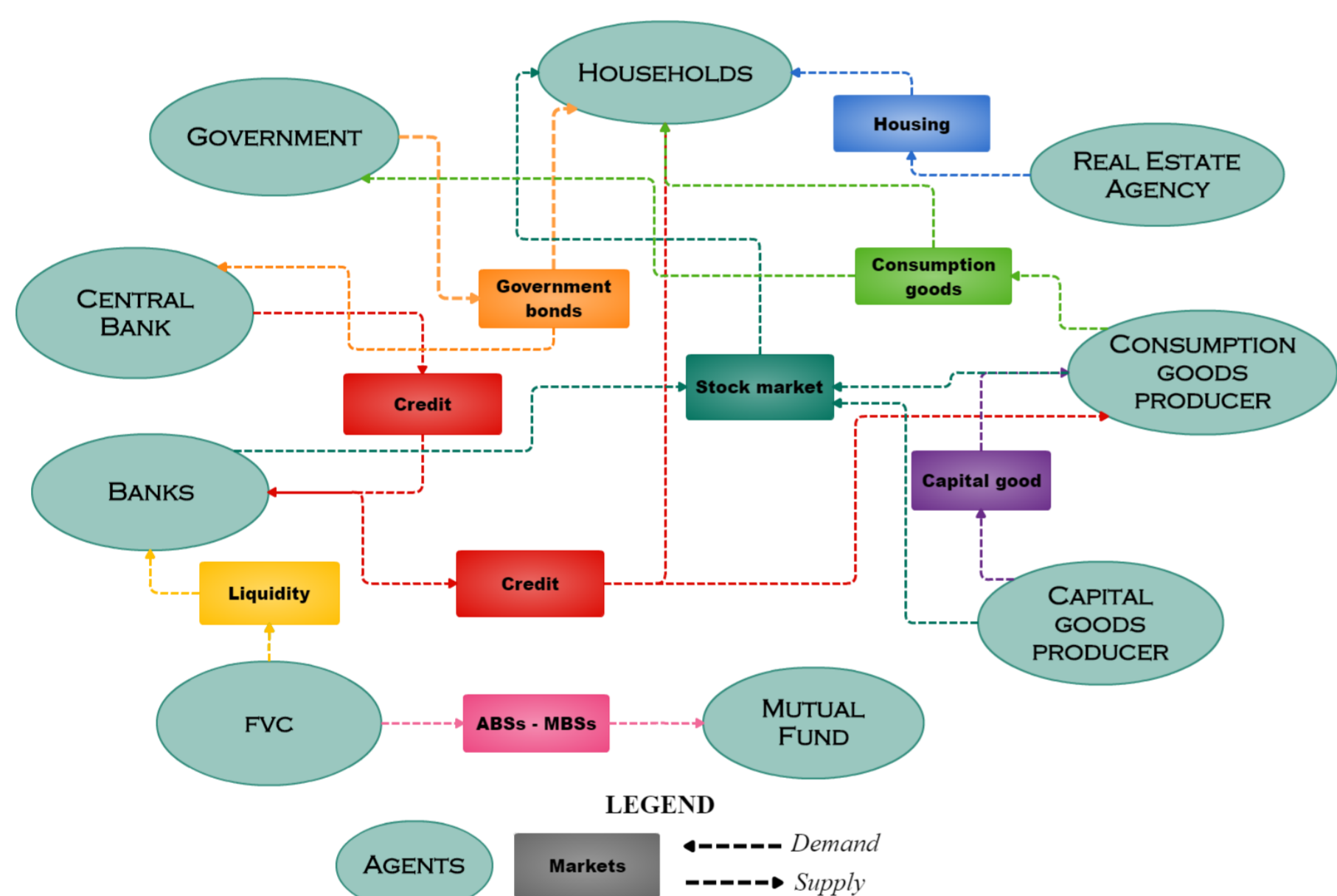# Financial Innovation, Securitisation and Housing Market: an Agent-Based Approach

E. Lauretta[a], A. Mazzocchetti[b], M. Raberto[b], S. Cincotti[b]

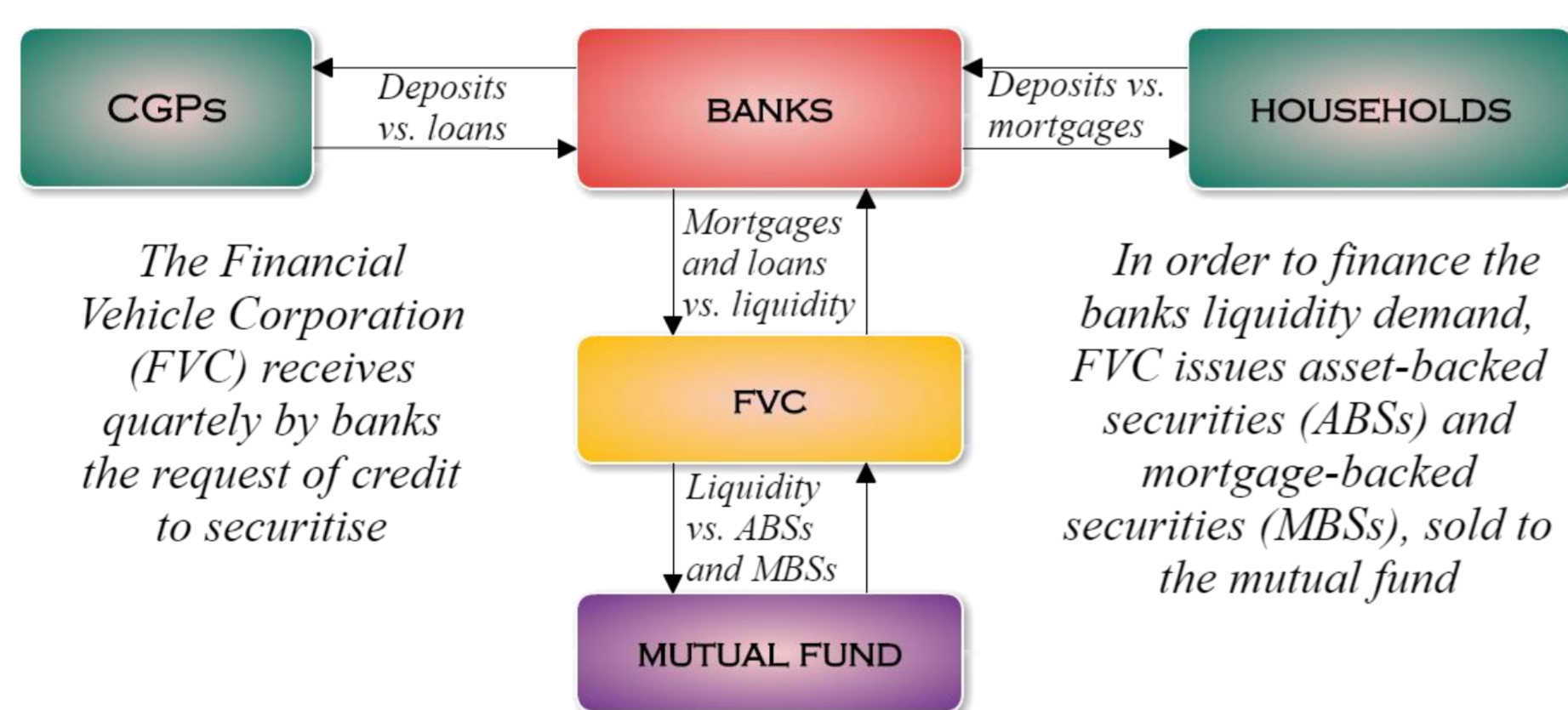[a] University of Birmingham [b] University of Genoa

Motivation and Research Question

- The study argues that an excessive **rate of financial innovation (RoFIN)** has triggered the global financial crisis (Lauretta, 2017, *forthcoming*).

- RoFIN can create positive or negative externalities producing amplified positive or negative financial effects that can impact on the business cycle.

- How to capture the RoFIN amplifying mechanism and model it?

- We model RoFIN as an endogenous variable which amplifies the endogenous money\credit creation.

- We use **EURACE** (e.g. Cincotti et al., 2010; Raberto et al., 2012; Mazzocchetti et al., 2016) agent-based and stock-flow consistent macroeconomic model and simulator, which includes several agents who act by following behavioural rules and interact among themselves through different markets.

- EURACE includes a **housing market and a securitisation process**, allowing the study of RoFIN as an endogenous variable, which is captured in the model by a change in the **debt-to-service-income (DSTI) ratio**, a flow control measure of mortgage lending by banks to households.

EURACE Agent-Based and Stock- Flow Consistent Macroeconomic Model and Simulator

Securitisation Process

The Financial Vehicle Corporation (FVC) receives quartely by banks the request of credit to securitise

In order to finance the banks liquidity demand, FVC issues asset-backed securities (ABSs) and mortgage-backed securities (MBSs), sold to the mutual fund

Securitisation Propensity

Bank are characterized by a securitisation propensity μ (between 0 and 1). Quarterly, depeding on its securitisation propensity, banks checks for credit to be securitised and determine the amount of risk weighted asset to securitise S^b as
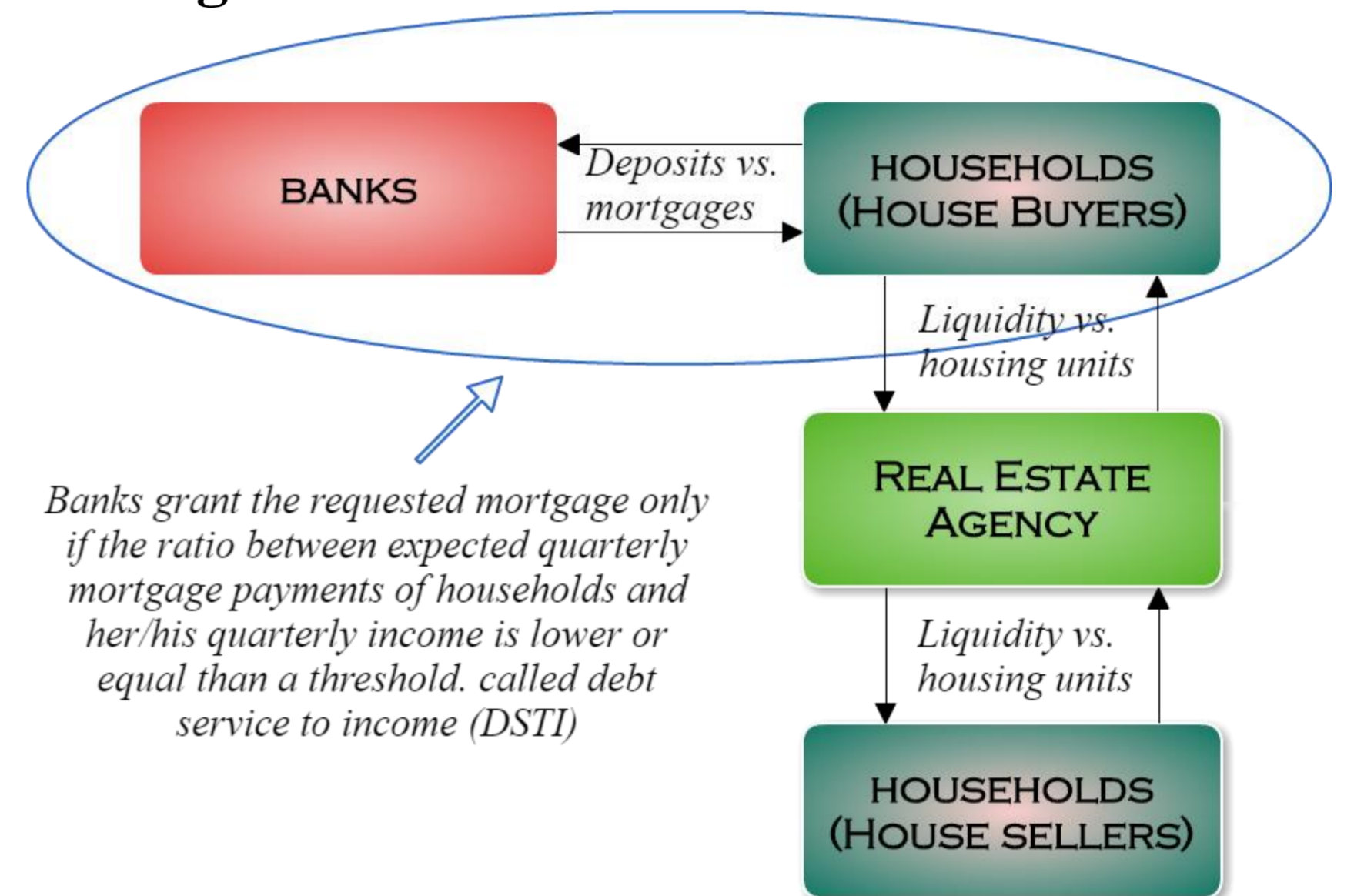
$$\begin{cases} S_b = W_b - (1-\mu)\alpha E_b & \text{if} \quad (1-\mu)\alpha E_b < W_b \\ S_b = 0 & \text{if} \quad (1-\mu)\alpha E_b \geq W_b \end{cases}$$

W_b : Bank b risk weighted asset portfolio

E_b : Bank b equity

α : Fraction needed as equity capital by bank b (Basel II /III capital requirements)

Housing Market

Banks grant the requested mortgage only if the ratio between expected quarterly mortgage payments of households and her/his quarterly income is lower or equal than a threshold. called debt service to income (DSTI)

Endogenous DSTI and RoFIN

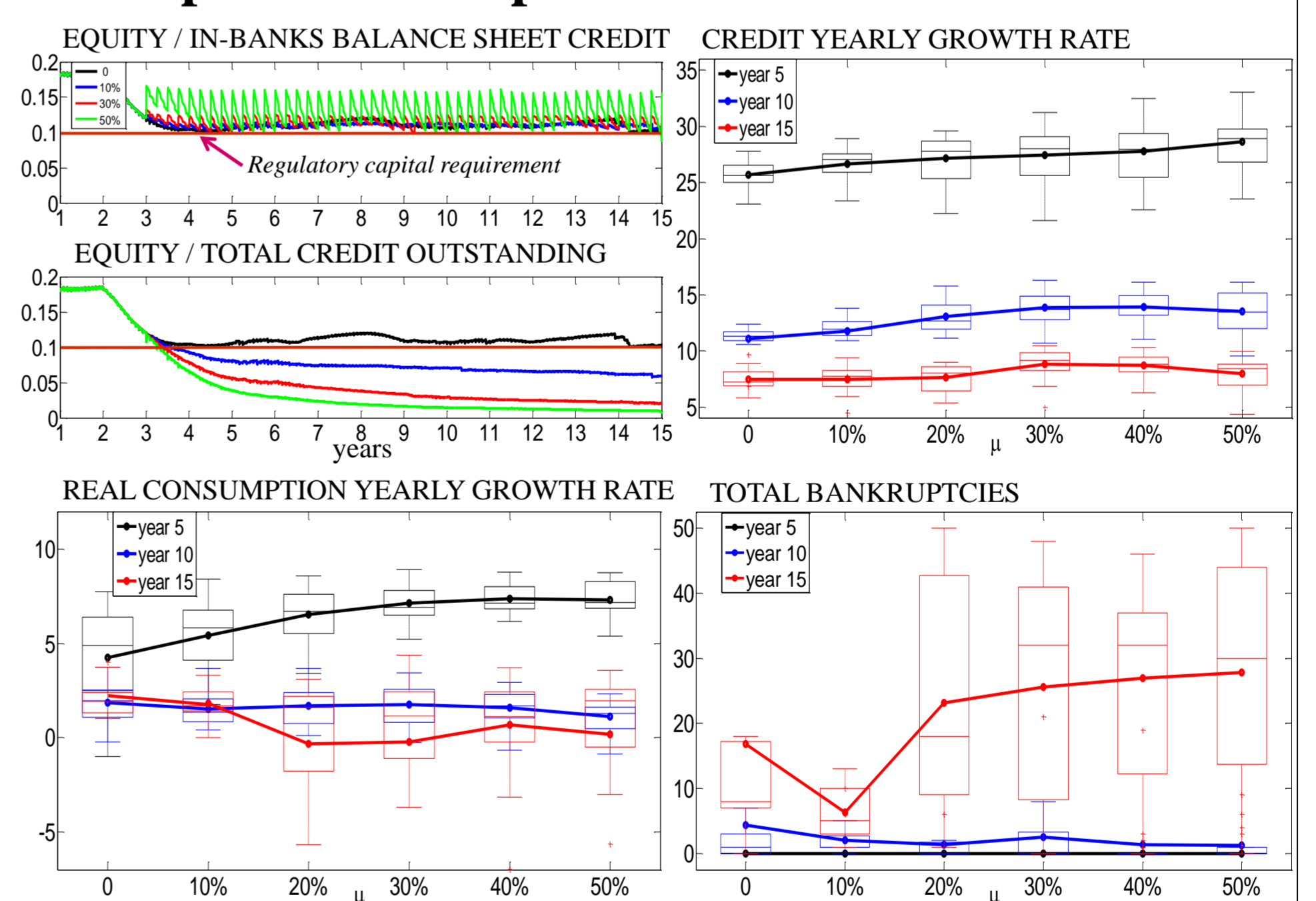The value of DSTI is endogenous and computed as follow

$$DSTI = 0.5 \frac{\varphi_S + \Delta P_{t,t-1}}{\varphi_S + \varphi_H}$$

φ_S : *maximum percentage price increase of housing price with respect to the previous month market price*

φ_H : *maximum fire sale price reduction*

$\Delta P_{t,t-1}$: *housing price monthly growth rate*

Computational Experiments

Conclusions and Future Research

- The **securitisation propensity** modifies **indirectly the DSTI,** which reflects the **households' creditworthiness** conditions required by the banking system to grant a mortgage and mirrors the **RoFIN** within the system.

- Banks become able to **overcome the regulatory capital reiquirements**. The interplay between securitisation and DSTI **impact on the credit and business cycles**.

- Further research could include the development of a more complex financial architecture and an enrichment of EURACE with a financial R&D sector.