

Understanding the Switch from Virtuous to Bad Cycles in the Finance-Growth Relationship

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Warwick Workshop in Economic Growth

Why is so important to analyse the link between Finance and Growth?

- ▶ The link between Finance and Growth revealed by the 2007-2009 Financial Crisis and the following Economic Recession.
- ▶ The characteristics of this kind of crises are their evolution from a typical financial crisis to a real economic crisis.
- ▶ The Policy actions seem to be ineffective (economic policy analyses and actions based on monetarist or neoclassical footprint).

We need bear in mind that **into the finance-growth relationship** is really important not ignore **the innovation role**.

- ▶ **The endogenous role of the money making process is the central argument.**
 - ▶ The presence in the economy of “bank money” and a financial system more and more advanced (not only constituted by banks) change intensely the nature of the credit and, as Minsky (1982) argued, the role of lenders are “endogenously destabilizing”.
- ▶ **Need to develop a new perspective on the financial role that defines the growth path.**
 - ▶ This view contrasts with the traditional one (Aghion and Howitt, 1998; Pagano, 1993; Grossman and Helpman, 1990; Romer, 1990), in which finance follows growth.

Literature Review

- ▶ The “two” Schumpeter:
 - ▶ Schumpeter (1934) - the evolution of the financial system into an economy is of crucial importance (preeminent role of credit in the economy; endogenous creation of money by credit mechanism).
 - ▶ Schumpeter (1939, 1942) - downplayed the role of external finance and the banking system in favour of an emphasis on internal finance.

- ▶ The “two sons” of his theories:
 - ▶ New Growth Theory (NGT) - more neoclassic - assumption are considered as artifacts (Romer, 1990; Grossman and Helpman, 1991; Aghion and Howitt, 1998, etc.).
 - ▶ Evolutionary Theory (ET) - directly Schumpeter's heir - assumptions are more connected with the reality (Nelson and Winter, 1982; Chiaramonte and Dosi, 1993 etc.).
- ▶ However:
 - ▶ NGT recently starts to consider the financial system in their model, which still have a exogenous role.
 - ▶ ET because based on the Schumpeter's second period of studies, they neglect the role of the financial system.

How to explain the Finance-Growth Relationship ...

- ▶ The new challenge is to introduce a theoretically sound foundation for a new paradigm finance-growth, highlighting the alternative direction of the analysis and promoting the interest to develop future research studies.

Research Questions

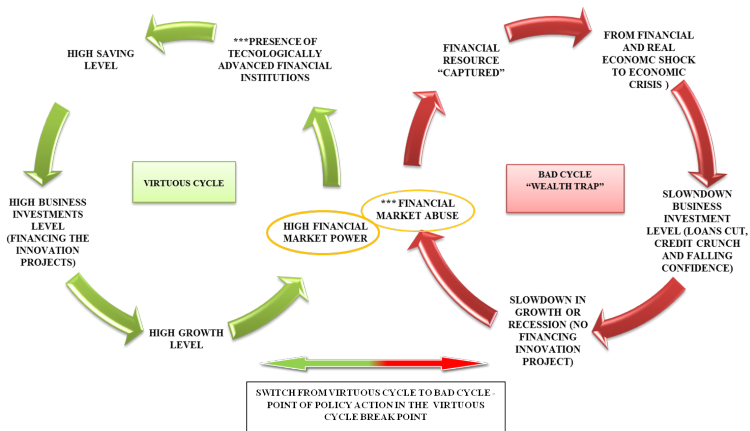
Given a financial system characterized by financial innovation and speculation, which make credit to become an endogenous means for money creation, such as Schumpeter argued, the first research questions are:

- ▶ **How does the financial system affect economic growth?**
- ▶ **Is there a profound difference between “sociological” and “technological” definition of the financial system?**

Research Hypothesis

- ▶ Two cycles called “Virtuous Cycle” and “Bad Cycle”.
 - ▶ Virtuous Cycle: Growth leads the financial system development and efficiency.
 - ▶ Bad Cycle: in opposite, the Financial System leads Growth.
- ▶ The financial system has changed its structure from the OTH (Originated-To-Hold) model to the OTD (Originated-To-Distribute) model. Therefore, the economic system switched from a “good” to a “bad” cycle.

The analysis attempts to clarify the **understanding of the switching**, prove the **existence of the two cycles** and **identify the break point** and the possible policies to restore the goodness of the business cycle.



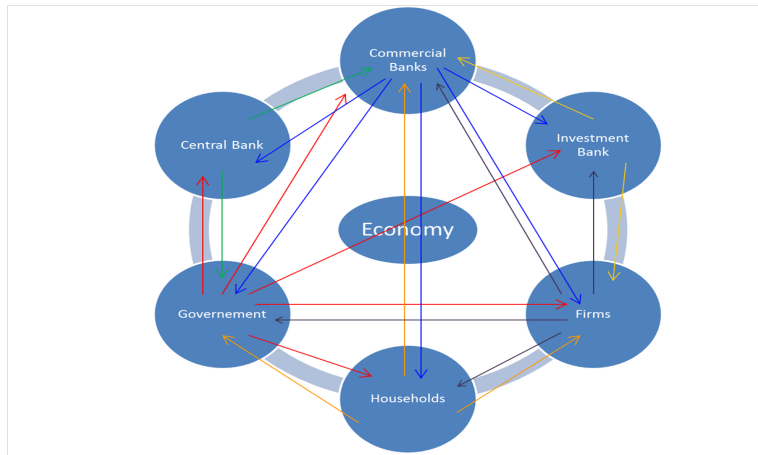
Methodology

- ▶ **ABM (Agent Based Model):** ABM is able to capture the financial causes. Where the DSGE (Dynamic stochastic general equilibrium) model has failed, this is the starting point for the agent-based computational economics model (Tesfatsion and Judd, 2006; Le Baron, 2006, LeBaron and Tesfatsion, 2008).
- ▶ **with Balance Sheet Approach:** is a recent methodology that supports the consistency of the ABM model checking its solidity and economically well foundation.

The Economy: Interactions for the Experiment

- ▶ Agents:
 - ▶ Banks (role of Commercial Bank and Investment Bank - Universal Bank Model applied)
 - ▶ Firms
 - ▶ Households (Workers/Consumers)
 - ▶ The Government
 - ▶ The Central Bank.

The Interactions Scheme



Key Assumptions Underpinning the Experiment

- ▶ The economy's financial instability resides in its **financial structure** rather than in exogenous shocks by the real sector or only in the agents' behavioural interactions.
- ▶ $\Delta Y = f(FP)$ with $FP = f(LR, FI, SZ)$
- ▶ A distortion of the Financial Power increases the Financial System Default *Risk* ($FSDR$); it affects the Growth Path; it triggers the Bad Cycle: $FSDR = f(BD)$; the volatility is determined by $\epsilon = \Delta FSDR / \Delta FP$.

Where Is The Experiment From?

... from the **BFSE (Base-line Financial System Economy Qualitative Model)**, drawn on the footsteps of Dosi et al. (2011) where:

- ▶ Banks role is extended.
- ▶ A Investment Bank and a Central Bank are introduced as new agents.
- ▶ The presence of Interbanking is considered.
- ▶ Firms and Households (Workers/Consumers) and a Government are drawn upon Dosi et al., 2011 (Bringing some aspects by Aghion and Howitt, 1998 and Villemeur, 2008 in the model).
- ▶ The markets considered are: Credit Market, Interbanking Market, Labor Market, Consumption good Market

The BFSE (Base-line Financial System Economy) Qualitative Model

	COM. BANKS	INV. BANK	FIRMS	HH (WK/CONS)	GOVERNMENT	CENTRAL BANK
CENTRAL BANK	$(+)i_{gc}$				$(+)i_{gc}$	
GOVERNMENT	$(+)TAX$ on FI	$(+)TAX$ on FI	$(+)TAX$ on π_i and FI	$(+)TAX$ on w		$(-)i_{gc}$
FIRMS	$(-)i_L(Loans_t(t-1))$; $(+)i_D(Dep_t(t-1))$		$(\pm)\bar{E}(t) = \sum_{t=1}^T E_t(t) f(t-1)$	$(\pm)\frac{\Delta w}{w(t-1)}$; $(\pm)\Delta Cons_z$	$(-)TAX$ on π_i and FI	
HH (WK/CONS)	$(-)i_L(Loans_t(t-1))$; $(+)i_D(Dep_t(t-1))$		$(\pm)\frac{\Delta w}{w(t-1)}$; $(\pm)\Delta Cons_z$	$(-)TAX$ on w		
INV. BANK	$(+)\delta \frac{Tot\ Loans}{Dep_b}$; $(-)p_{buy}$				$(-)TAX$ on FI	
BANKS		$(-)\delta \frac{Tot\ Loans}{Dep_b}$; $(+)p_{buy}$	$(-)i_D(Dep_t(t-1))$; $(+)i_L(Loans_t(t-1))$	$(-)i_D(Dep_t(t-1))$; $(+)i_L(Loans_t(t-1))$	$(-)TAX$ on FI	$(-)i_{gc}$

Note: FI = Financial Income; \bar{E} = competitiveness; w = wages; Dep = Deposits; p -buy = price paid by investment bank to purchase the loans transferred by commercial banks

The Increment in ICEACE Model

- ▶ Using the ICEACE (E. J. Erlingsson et al., 2013) ABM model (open source) as base for implement the core of the model (role played by the financial innovation) to test if there are evidence of the underlying assumptions (demonstrating the bad cycle)

Conceptual Preamble of the Experiment

Usually, the main conclusion is:

"...easy access to mortgages loans causes a higher economic instability with higher chance for deep and violet recessions"
(Erlingsson et al. 2013, p. 28)

However:

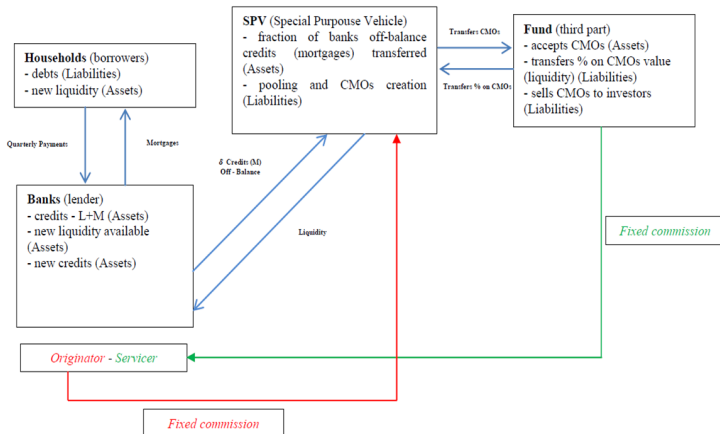
What was the origin of easy access to mortgages and loans?
and What are the main reasons for banks to have had the opportunity to extend the credit market?

- ▶ financial deregulation without a technologically advanced financial transformation would not have instigated any change in banks behaviour in terms of creditworthiness conditions (or it would be very partial and not relevant)

Why banks make securitization...

- ▶ asset risk reduction
- ▶ reduce regulatory capital requirements
- ▶ collect new liquidity at a reduced price (not from deposits)
- ▶ transform profits from interests income (by lending) into profits from commission income (by intermediation – more stable).

Interactions Scheme of ICEACE Increment



Inizializzazione Settings Related to the ICEACE Increment

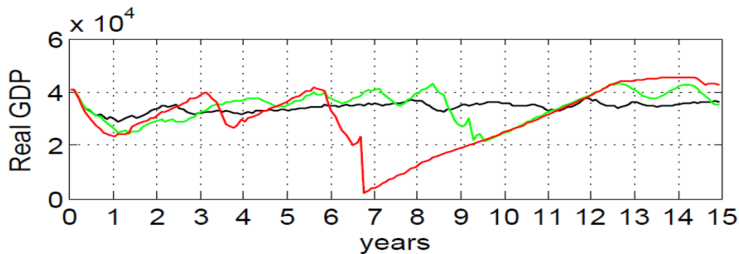
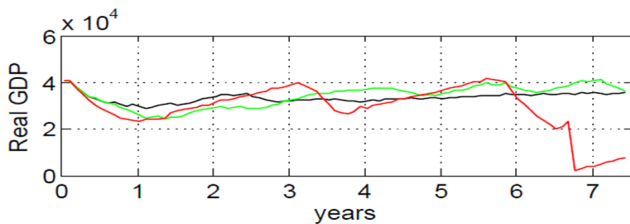
- ▶ Banks' balance sheet redefined including the securitization process (Incremental scripts)
- ▶ $MaxSecuritizationRatio(Max\delta) = [0.5]$ (measure of the maximum level of securitization realizable in the system)
- ▶ $Firms' Liquidity(Firms + ConstructionFirms) + HHS' Liquidity = Deposits$
- ▶ Mortgage duration (40 years) and $CAR(0.05)$ are established according Erlingsson et al. (2011) and the literature related (i.e. Carrol et al. 2011).

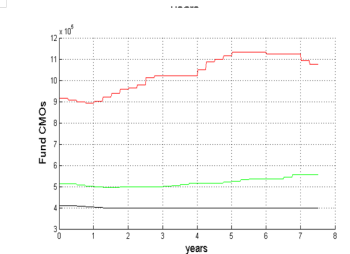
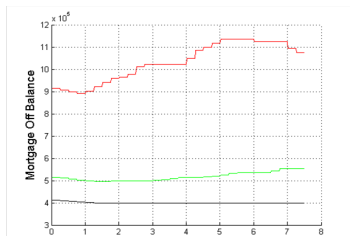
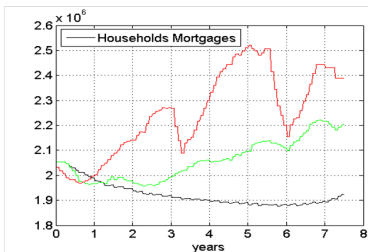
- ▶ Initial CAR for each single bank is fixed at $\chi(0) = 10$ (parameter used to establish the equity level)
- ▶ At the end of each year, Banks debts to the Central Bank are used to equilibrate the bank balance sheets.
- ▶ The securitization ratio of each bank is determined:
$$\delta(t) = \text{Mortgagesoffbalance}(t) / \text{TotMortgages}(t)$$
- ▶ Important will be the impact on the CAR calculation given the securitization process as a reduction of the capital required by Central Bank: $\varphi(1 - \delta)\text{Asset}(t)$
- ▶ Financial Innovation Degree ($FIN(t)$) = [0.4, 0.5, 0.9] (measure of the development level of the financial tools - Degree of the Technologically-Advanced Financial System Development, given the RD sector)

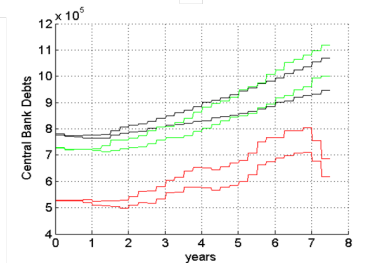
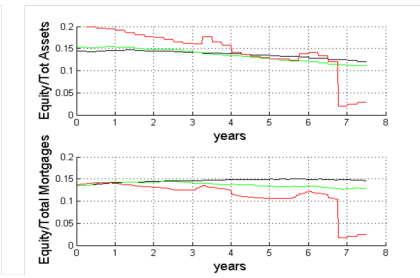
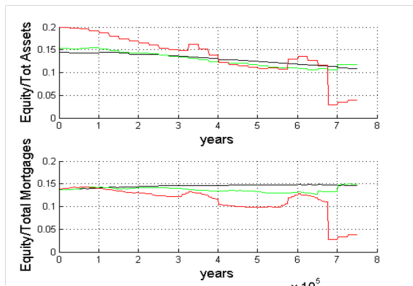
- ▶ $\beta = f(S)$ with S = securitization process.
Beta represents the budget constraint. It sets banks' behaviour when they evaluate the Households capability to repay a mortgage before to grant it.
- ▶ Beta is an endogenous phenomenon of the two related parameters: Max Securitization and Financial Innovation Degree

$$\beta(t) = FIN(t)\delta(t)$$

- ▶ Only two leverages level are considered (given the assumption that the leverages in the system are multiple)







An Introductory Discussion on the Possible Policy Proposals

The policies applied have demonstrated that are unable to identify and resolve the structural factors which have caused the 2007-2009 crisis.

- ▶ Because they use macro-cyclical tools of policy set up on the neoclassical assumptions
- ▶ Because they try to stabilize the system when a crisis is manifested at increasingly higher levels of leverages rather than bring it back at a certain goodness (virtuous cycle).

The research aims to introduce a policy discussion in the following two directions:

- ▶ **How can the Virtuous Cycle be restored?**
- ▶ **How to prevent a virtuous cycles become a bad one?**

Possible Alternative Set of Policy Tools

Alternative sets of policy tools to promote the restoring of the "Virtuous Cycle" could be a mix among:

- ▶ Microprudential Policy
- ▶ **Macroprudential Policy**
- ▶ Monetary Policy
- ▶ **Structural Policy**

Building an Alternative Policy Agenda

- ▶ to constrain the **OTD breaking up effect** of the value chain of mortgage and loan supply and the **multi-multiplier effect** of the leverages present along the value chain.
- ▶ to contain financial innovation abuse for profit-seeking private interests (finding a way to **keep the financial innovation degree at a certain level**)
- ▶ to rethink the **size concept of banks** (no lying anymore about the motto "too big to fail")

Main Contribution

The main contribution provided with the research conducted is that the non-linear causality interactions (causes-effects) are influenced by the different levels of **financial innovation degree** present within the financial system at any time and by the established OTD model (originated-to-distribute – where the structural leveraging subdivision between agents who are involved in the financial system has been developed).

In Summary

- ▶ The trade-off between public and private interest seems likely to be the reason for the switching between good and bad cycle.
- ▶ The analysis highlight the urgency to move in the direction of considering alternative policies to regulate the new established paradigm (finance-growth).
- ▶ The policy goals coming up from the analysis are a good start-point to make to reflect both scholars and policy makers.
- ▶ A mix of policies, developing in particular the macroprudential and structural policy tools, seems to be the direction to follow or to investigate more in depth.

Future Research

- ▶ Investigation and development of an articulated and detailed policy proposal agenda.
- ▶ Implementation of a set of experiments which might be able to show the historical passage of the economy from virtuous to bad cycle.
- ▶ Implementation of a set of experiments on the virtuous cycle and its financial resilience.
- ▶ Calibration with real data.

THANKS FOR YOUR ATTENTION!