





Economic Studies Division FLAR

X Meeting of Monetary Policy Managers, Asunción - Paraguay

# Monetary and Macroprudential Policy in Small Open Economies

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## Main messages

- Central banks have an important role in detecting how commercial banks react to financial shocks.
- All financial shocks are not equal, some depend on macro fundamentals, others are linked to an exaggerated perception on fundamentals.
- Different shocks imply different transition mechanisms, and therefore different consequences to the economy.
- There should be a differentiated reaction of the policy maker depending on the financial shock that the economy is facing.



# Motivation



## Financial stability, an important issue

- Financial stability has been a very important issue for Latin American countries during decades. Credit fluctuations were a very important determinant in recent crises (for example, 90's).
- During last decade, region has gained important stability as a result of important measures in different fronts (fiscal, monetary, and financial) and exceptional external behavior (high commodity prices and low interest rate).
- As a result of recent global crisis, policy makers has focused their attention on the link between financial stability, monetary policy and macroeconomic stability.
- Some financial shocks are explained by a credit risk misperception (cycles of over confident and over pessimist behavior).



# The Model



## Model

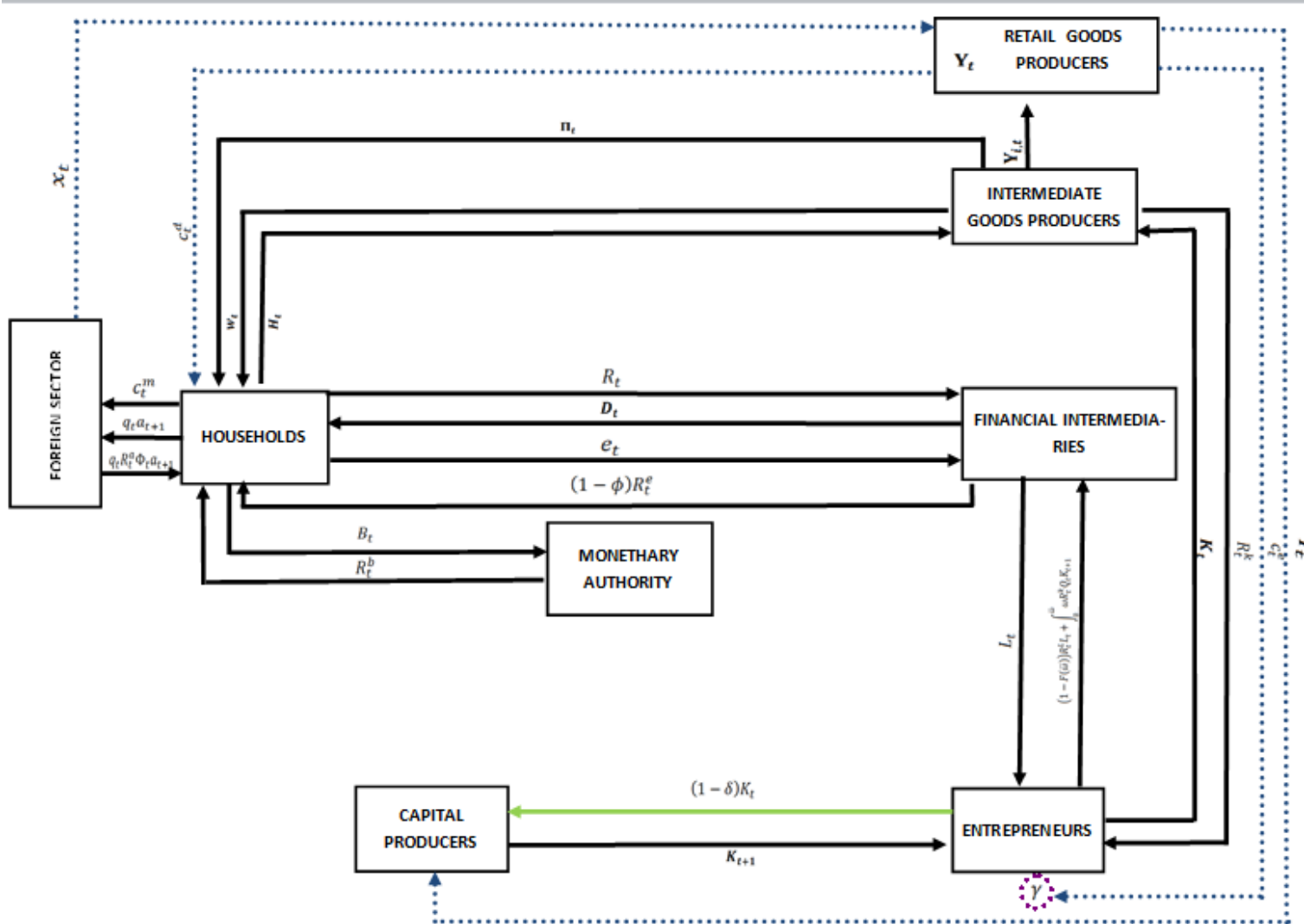
Purpose of this study is to analyze the interaction between monetary and macroprudential policy in a small open economy through the implementation of a economic policy rule which include macroprudential objective.

From a theoretical point of view, there are various models which include financial system, one of them is Bernanke, Gertler and Gilchrist (1999), BGG from now on.

- This model illustrates the financial accelerator described in BGG (1999)
- Also incorporates the modifications to the financial contract, so that risk is shared between firms and financial sector (like in Zhang (2010) and Shu (2012)).



# Model





## The financial contract

Entrepreneurs take loans in order to acquire new capital

$$Q_t k_{t+1}^i = N_{t+1}^i + L_{t+1}^i$$

Lending rates and productivity threshold are determined by the financial sector zero profit constraint: expected return equals opportunity cost

$$(1 - F(\bar{\omega}_{t+1}^{i,a})) R_{t+1}^L L_{t+1}^i + (1 - \mu) \int_0^{\bar{\omega}_{t+1}^{i,a}} \omega_{t+1}^i E_t R_{t+1}^k Q_t k_{t+1}^i f(\omega_{t+1}^i) d\omega = R_{t+1}^f L_{t+1}^i$$

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Non default projects

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Default projects

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Funding

Finally the productivity threshold is so that maximizes the expected returns

$$\max_{\bar{\omega}_{t+1}^i} E_t \left\{ \int_{\bar{\omega}_{t+1}^i}^{\infty} \bar{\omega}_{t+1}^i R_{t+1}^k Q_t k_{t+1}^i f(\bar{\omega}_{t+1}^i) d\omega - (1 - F(\bar{\omega}_{t+1}^i)) \bar{\omega}_{t+1}^i R_{t+1}^k Q_t k_{t+1}^i \right\}$$



## Banking Sector

Banking sector funding is done through equity and deposits, this is:

$$L_t = e_t + d_t$$

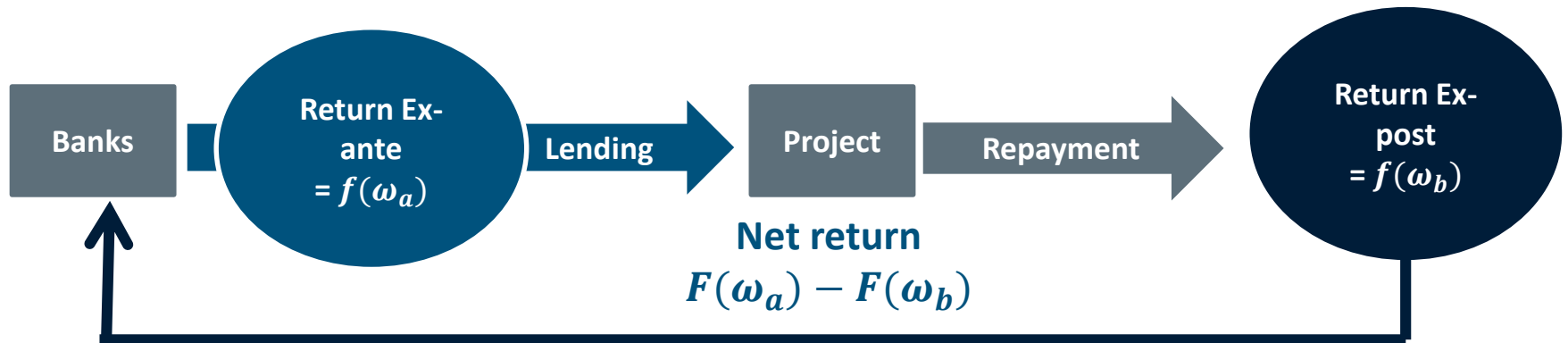
Equity's dynamic is given by:

$$e_t = \underbrace{(1 - \phi_t)e_{t-1}}_{\text{Non defaulted equity}} + \underbrace{(1 - F(\bar{\omega}_t^b))}_{\text{Non defaulted loans}} \underbrace{(1 + R_t^L)L_t}_{\text{Recovered defaulted loans}} + \underbrace{(1 - \mu) \left( \int_0^{\bar{\omega}^b} \omega R_t^k Q_{t-1} k f(\omega) d\omega \right)}_{\text{Funding and wage}} - \underbrace{R_t^f L_t + w_{t-1}^b}_{\text{Funding and wage}}$$

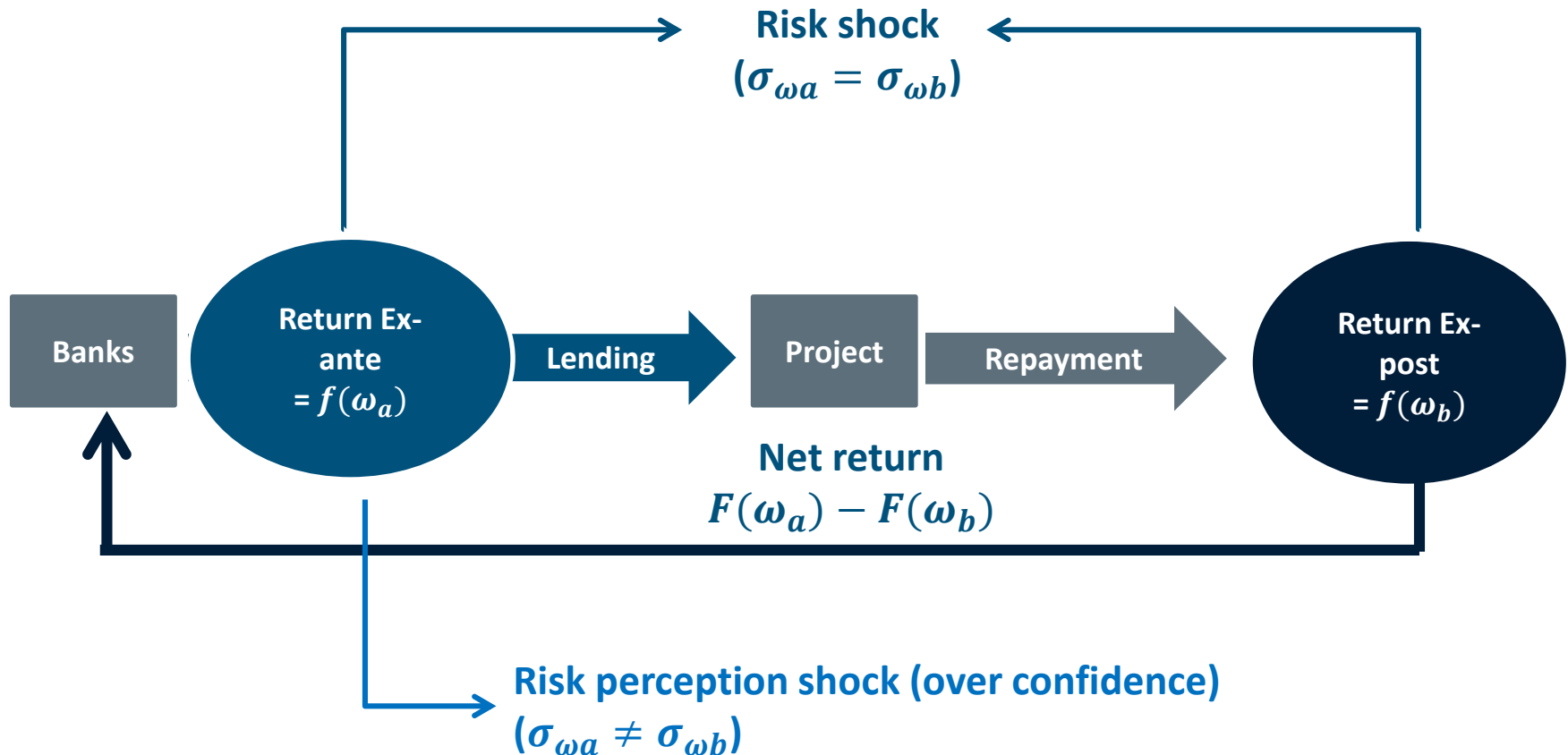


## Timing on credit decisions

Zhang (2010) and Suh (2012) propose a scheme in which the project's productivity observed at the time of credit approval (ex-ante) differs from the productivity after project realization (ex-post).

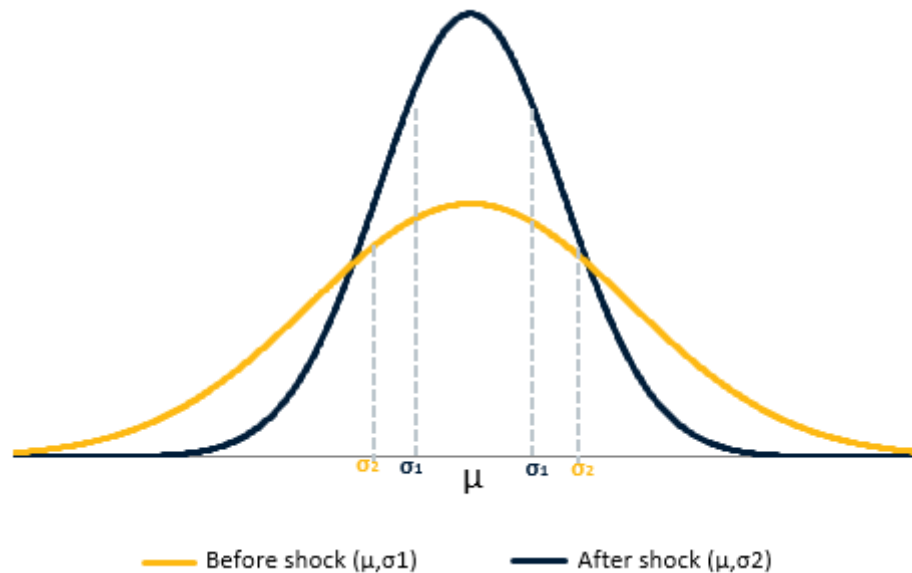


# Timing on credit decisions and shocks



## Financial shock

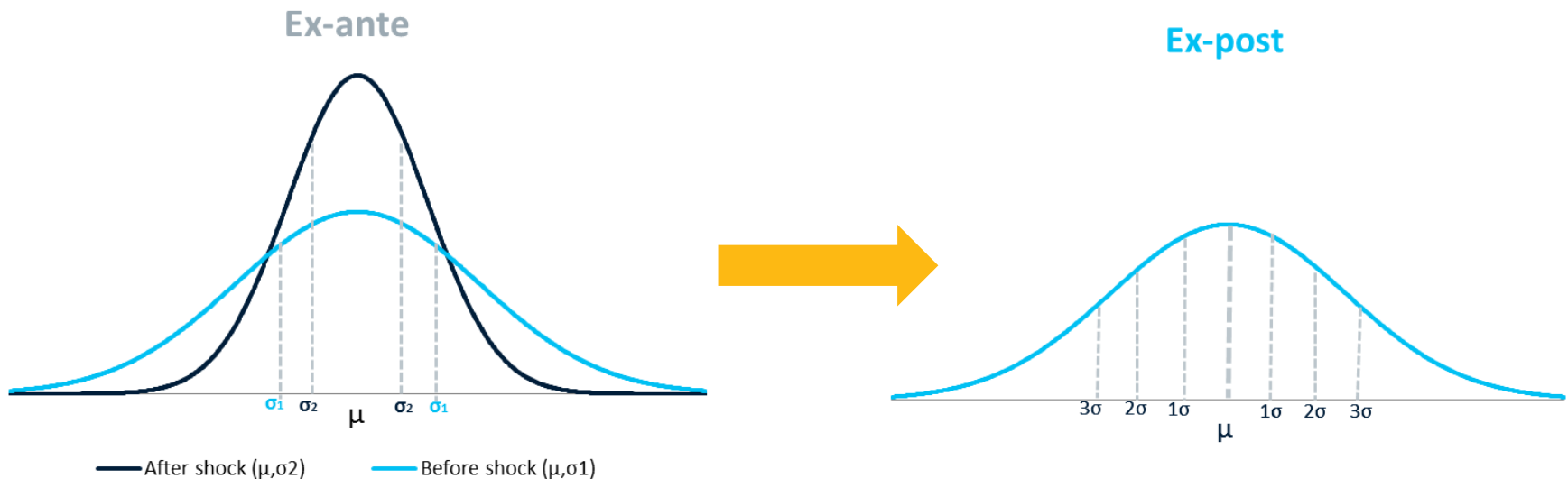
Following Christiano et al (2010) we propose a financial risk shock. Christiano shocks the variance of the projects' stochastic productivity



Shocks in variance shifts the difference between good and bad projects, therefore risk premium changes.

# Financial shock, a misperception of the risk

We propose a second type of shock, a shock on risk perception. This means that the ex-ante productivity perception is affected but not the ex-post productivity.



The shock only has effects on the initial perception, therefore the effects on the interest rate premium are reduced.

## Monetary policy

As in Zhang (2009), monetary policy determines the interest rate on bonds owned by households. The rule that determines rate is:

$$R_t^b = (1 - \rho_b)R^b + \rho_b R_{t+1}^b + a(\pi_t^{ss}) + b(y_t - y) + c(L_t - L) + \varepsilon_t^{R^b}$$

Where:

- $\pi_t^{ss}$  is the price deviation from its long run value
- $y_t - y$  is the output gap
- $\varepsilon_t^{R^b}$  is an identically distributed shock with mean 0 and variance  $\sigma^{R^b}$
- $L_t - L$  is the loans deviation from its long run value. Greater values of  $c$  imply a central bank more concerned with the credit growth.

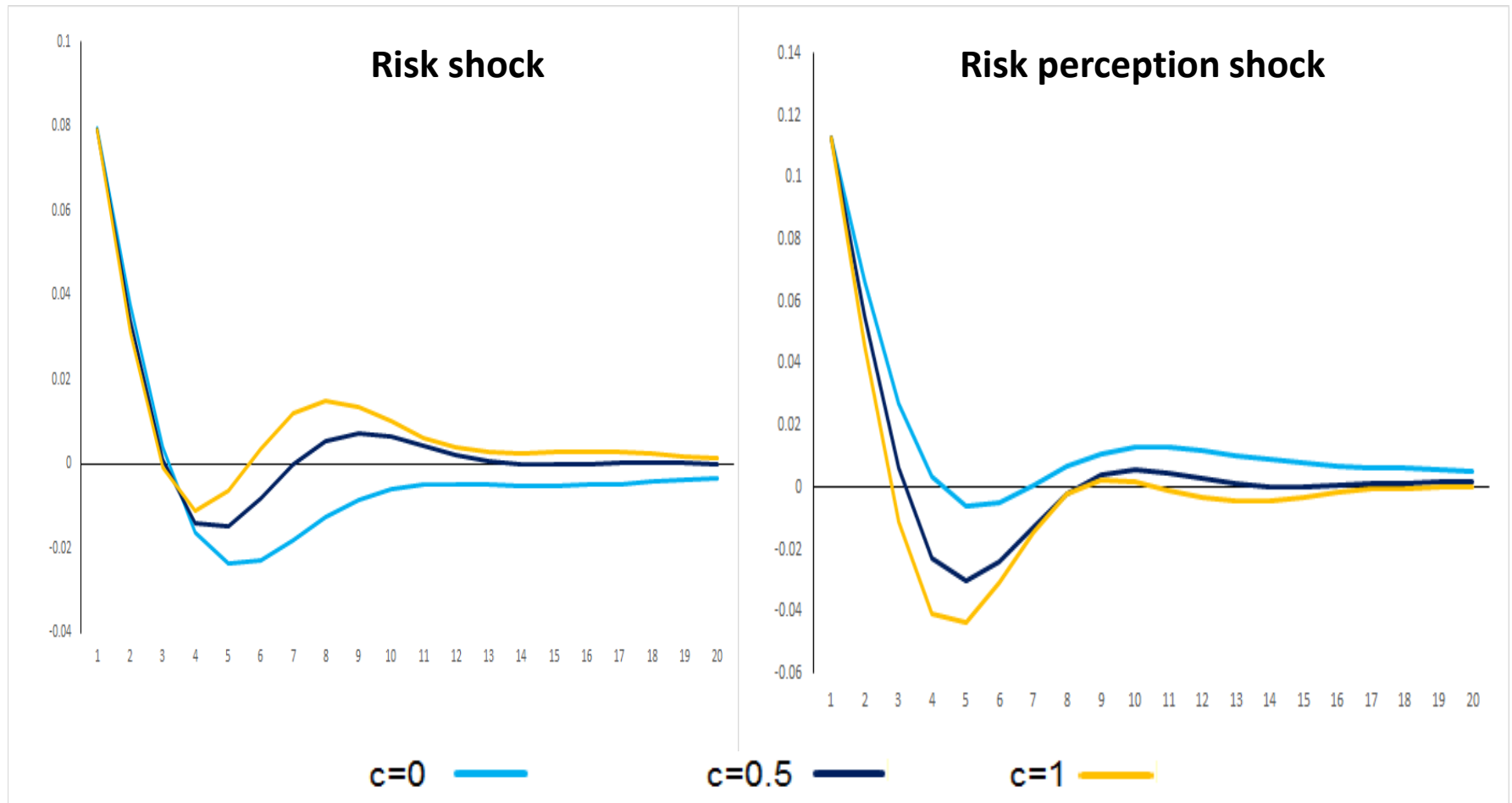


# Results



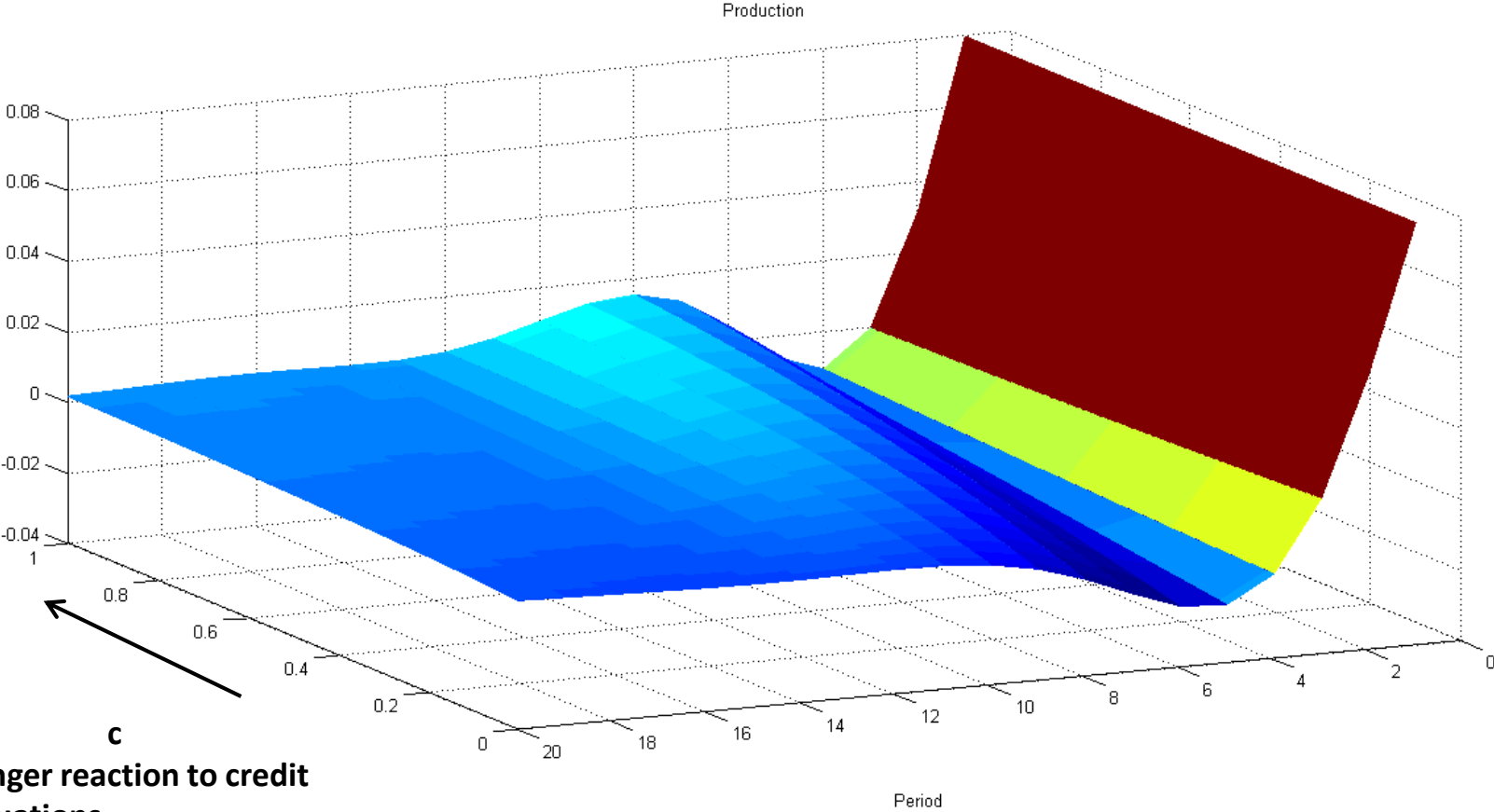


# Differences between risk and risk perception



# Differences between risk and risk perception

## Risk shock

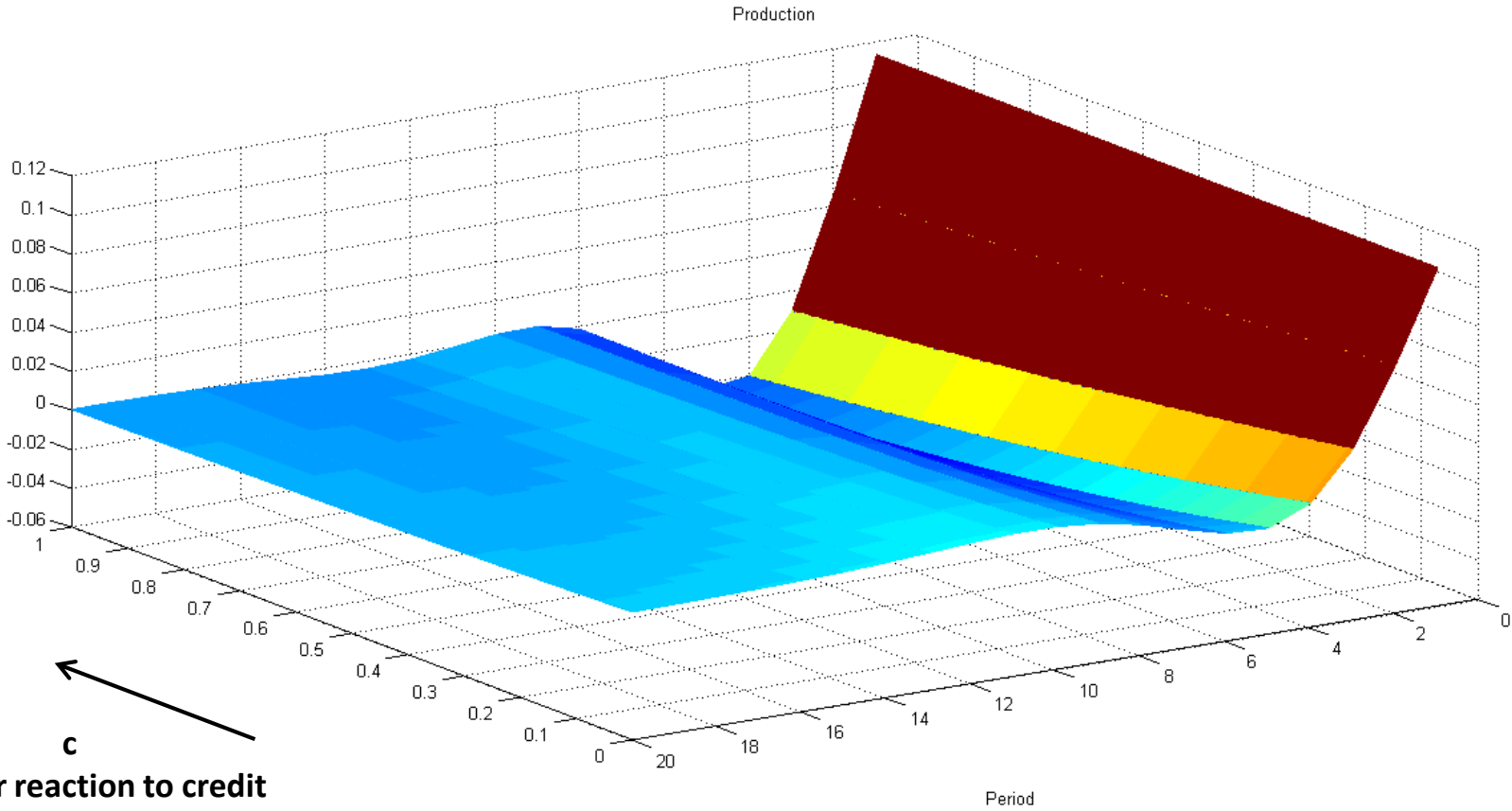


**Stronger reaction to credit fluctuations**



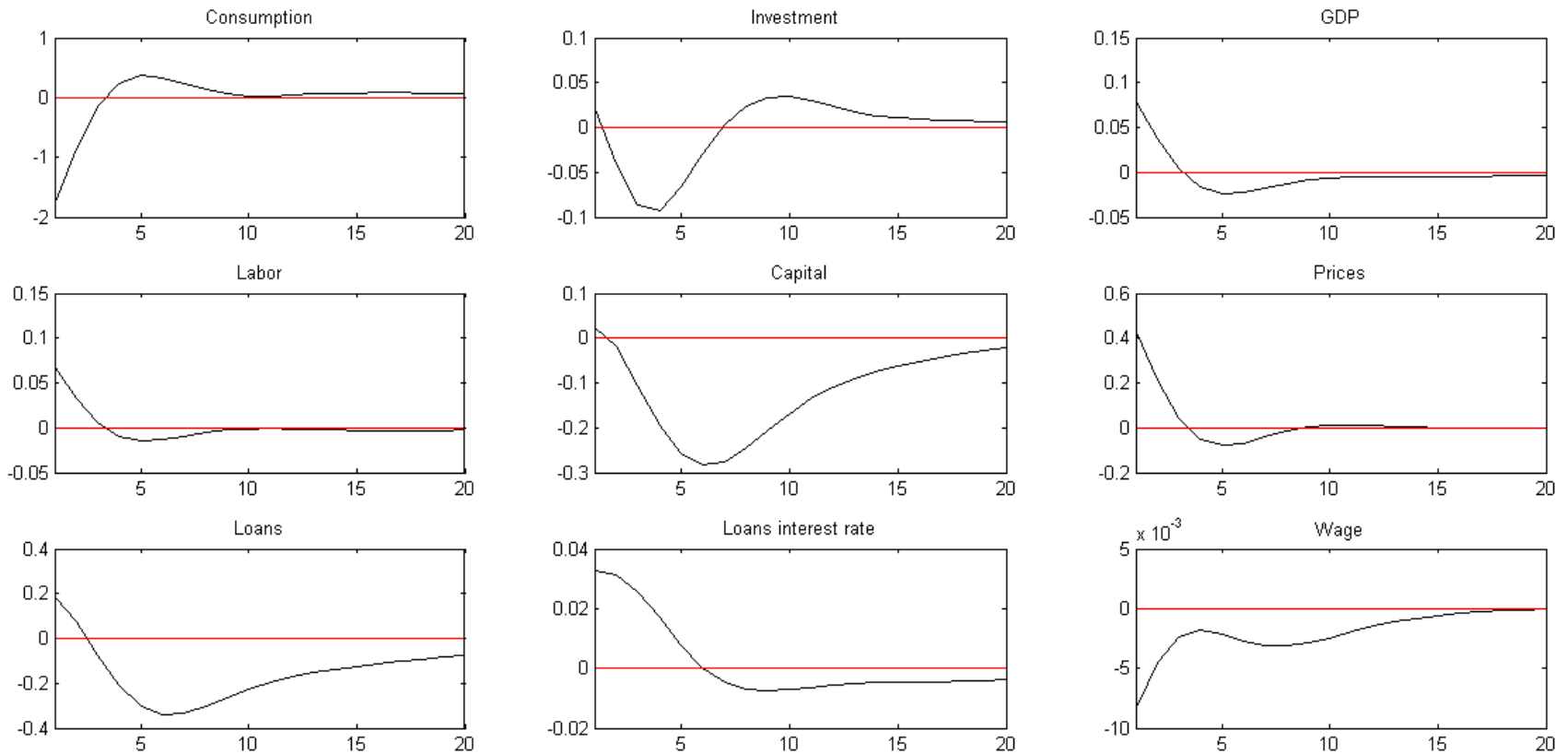
# Differences between risk and risk perception

## Risk perception shock

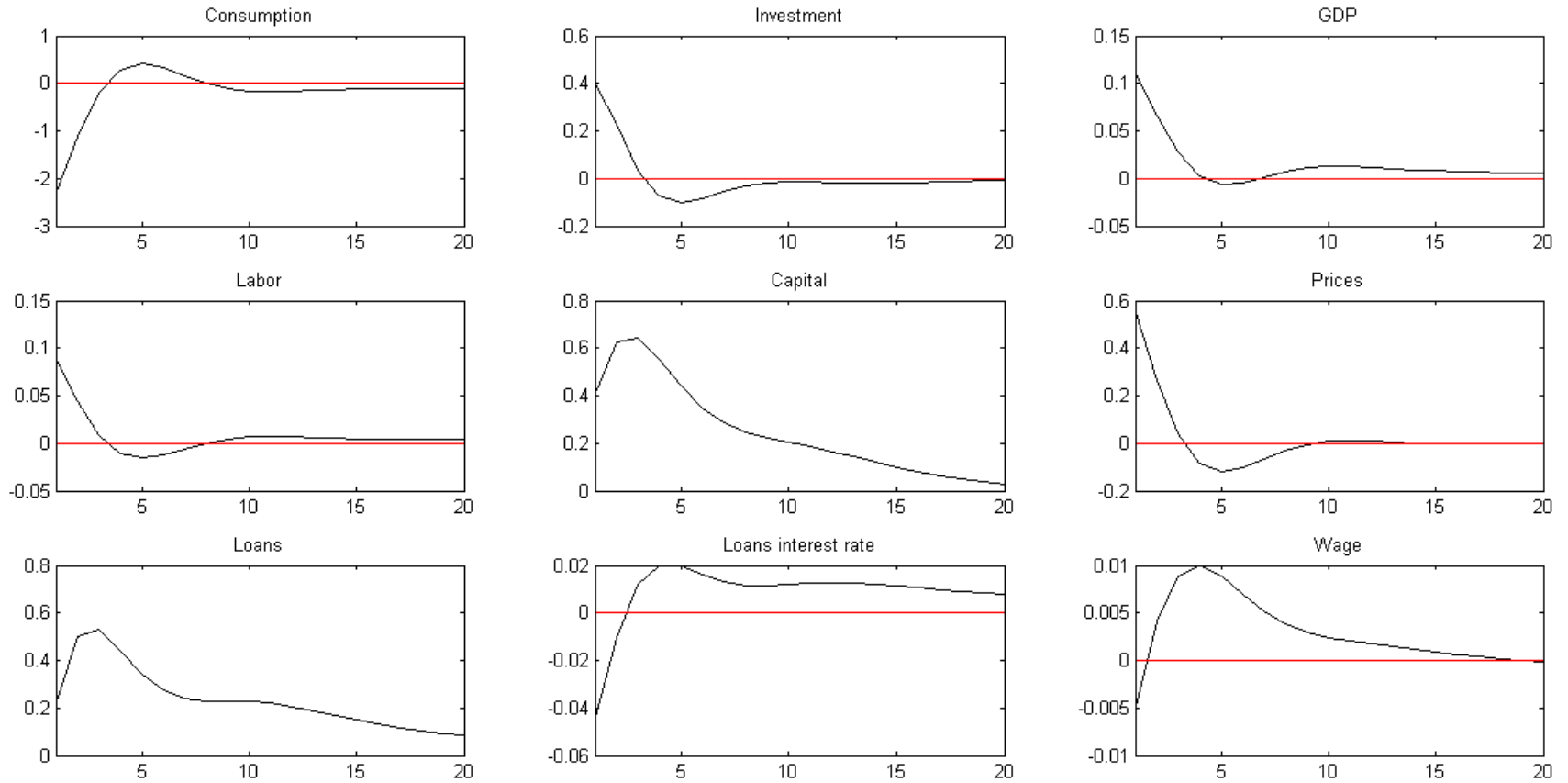


**Stronger reaction to credit fluctuations**

# Shocks: 0.1 Std transitory increase on risk



# Shocks: 0.1 Std transitory increase on risk perception



**Road ahead**



## Final Comments

- The nature of the financial shock determines the appropriate policy response
- Prudential Policy: Central banks has to detect when commercial banks are overreacting to a shock in the economy, in order to avoid important credit and output fluctuations
  - Enhanced Financial Stability Departments
    - Mechanism of evaluation of how commercial banks face the cycle
- At micro level, it is important to have enough information about financial system clients to distinguish the causes of the credit cycle, for example, financial deepening Vs. Over optimism



## Road Ahead

- There is an important policy field at a micro level that is not covered by our study
- Explore new policy instruments
- Optimal policy analysis
- Analyze implications in terms of welfare

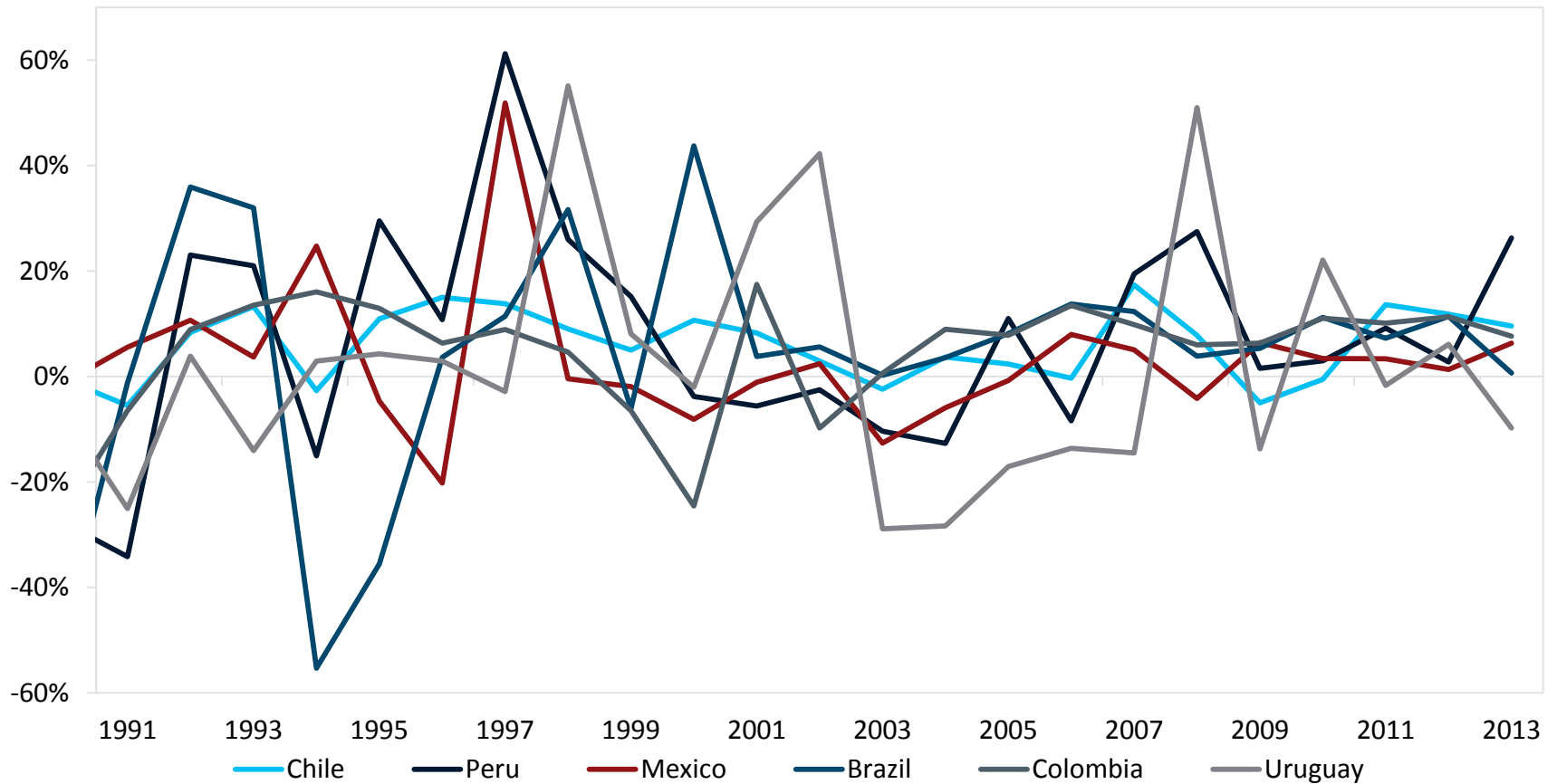






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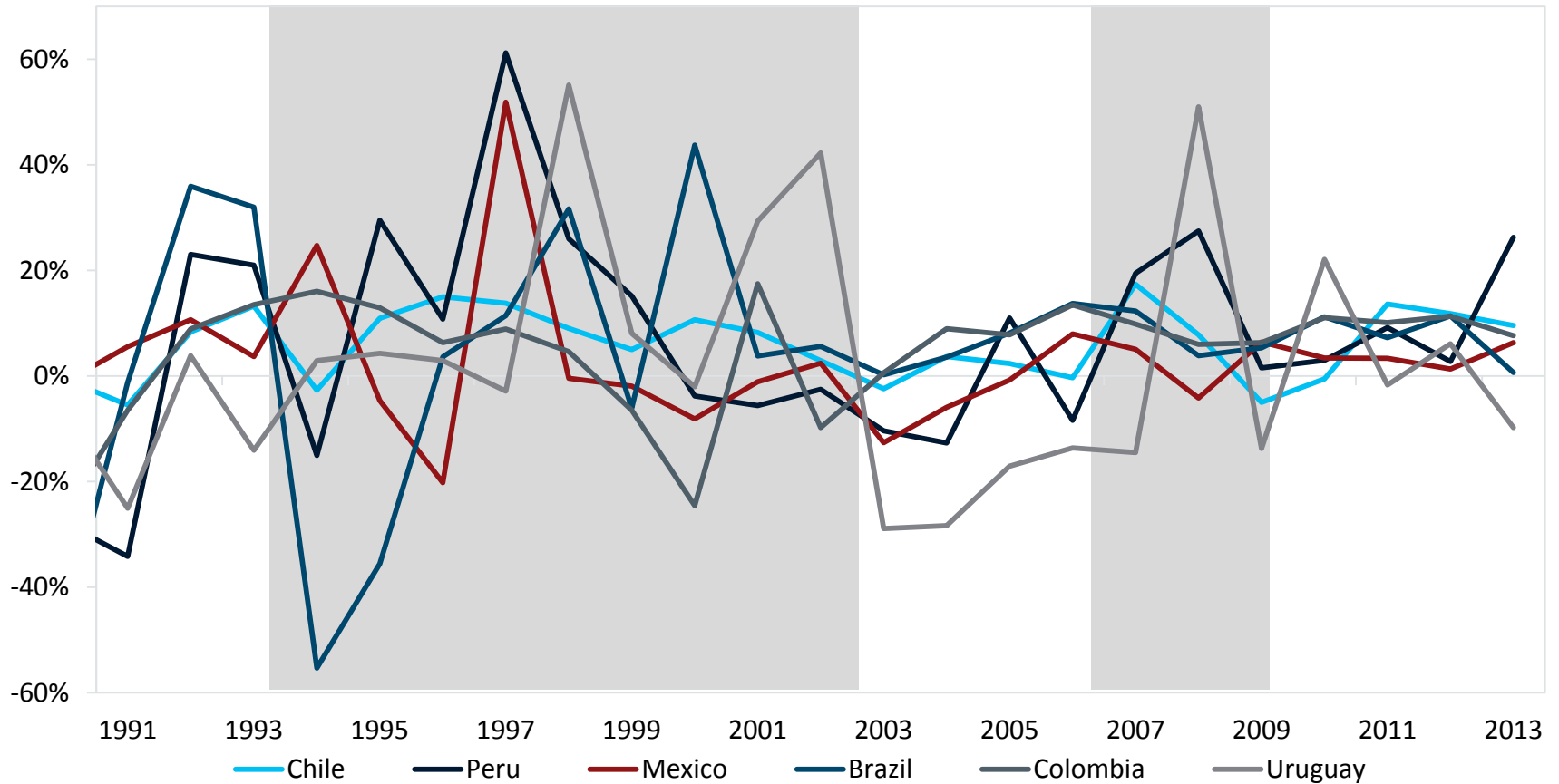
## Credit dynamics in L.A. in the last 20 years



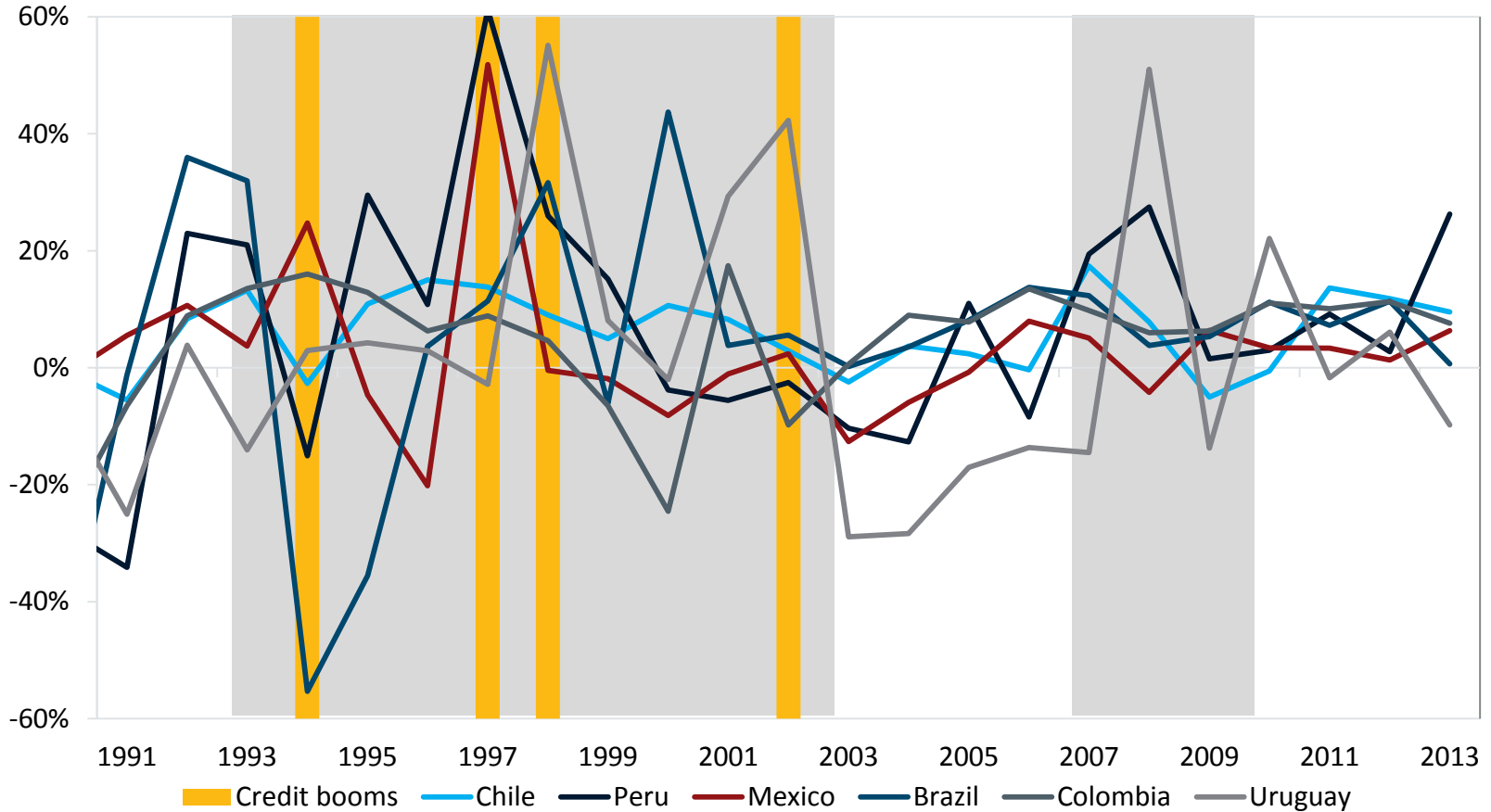
Source: IIF



# Credit dynamics in L.A. in the last 20 years



# Credit booms following Elekdag and Wu (2011)



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