EXPLORING LEADING INDICATORS OF BANKING CRISIS IN CASE OF ALBANIA

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Introduction

❑ The financial crisis (2007-2008), highlighted the need for an effective set of policy tools to mitigate systemic risk and prevent future crises;

❑ Central banks/other institutions have engaged in building macroprudential policies to discourage the build-up of macro-financial vulnerabilities;

❑ The activation of macroprudential tools takes time, so policymakers need to be aware of the risks and vulnerabilities at early stage.

Motivation

The need for some *reliable leading indicators* of systemic banking crisis in case of Albania:
- ➢ signaling in advance the accumulation of vulnerabilities in banking sector
- ➢ completing the macroprudential framework;
- ➢ providing guidance for future activation of macroprudential instruments.

Literature:

- Alessi & Detken (2013)
- Bell J, & D.Pain (2000)
- Borio C, & P. Lowe (2002a,b):
- Borio C, & M.Drehmann (2009)
- Lainà P & Nyholm J & Sarlin P (2014)
- Kaminsky G, & C. Reinhart, (1999)

Methodology

❑ **Univariate signal extraction approach** (Kaminsky & Reinhart, 1999)

➤ non-parametric method

➤ based on the view that crises are preceded by accumulation of imbalances and that the movements of some macro-financial indicators beyond certain critical levels, can help to detect them ahead in time.

Steps:

➤ *Definition of past stress event/crisis events and their starting and ending date (indexes, past literature, reports);*

➤ *Binary definition of past stress/crisis (1-crisis, 0-no crisis);*

➤ *Selection of potential leading indicators of banking stress/banking crisis;*

➤ *Setting the thresholds Vc for each indicator Vt; setting the predicting time horizon H*

➤ *Classification of observations for each variable Vt according to Confusion Matrix , for a given threshold Vc:*

	Crisis	No crisis	Type I errors	Type II errors	Predicted crisis (%)
Crisis Signal (Vt> Vc)	A	B			
			C/(A+C)	B/(B+D)	A/(A+C)
No crisis signal (Vt<Vc)	C	D			

Two measures:

1. *Minimization of Noise-to-Signal ratio = min* $(\frac{\text{Type II errors (\%)}}{1-\ \text{Type I erros (\%)}})$

2. Minimization of policymakers loos function $= L = \theta\ \frac{C}{(A+C)} + (1-\theta)$, so $min(\theta;\ 1-\theta)$

Condition:
Indicator should predict > 50% of crisis episodes.

Stress events- the case of Albania

- Albanian banking sector never experienced a banking crisis according to common definitions in literature;
- Over the past 20 years some episodes of severe financial distress have occurred, similar to crisis events.
- Stress events are defined through Financial Systemic Stress Index (FSSI)

FSSI and the episodes of systemic banking stress.
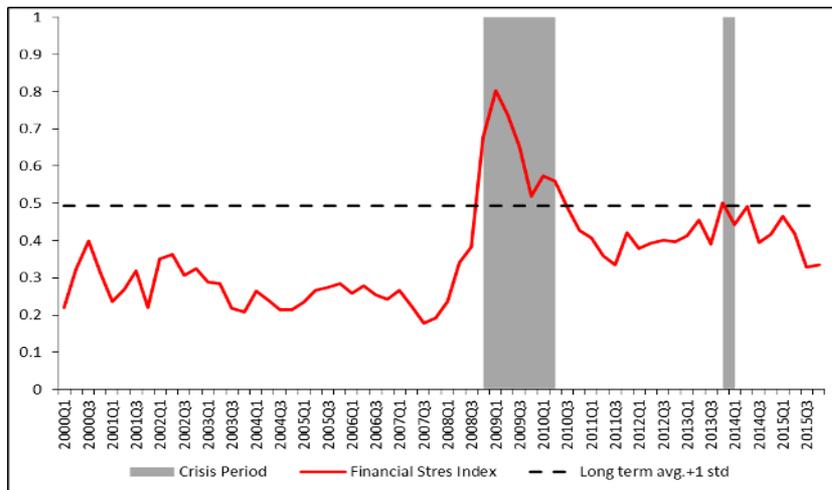
Sources: Kota and Saqe (2013), Bank of Albania
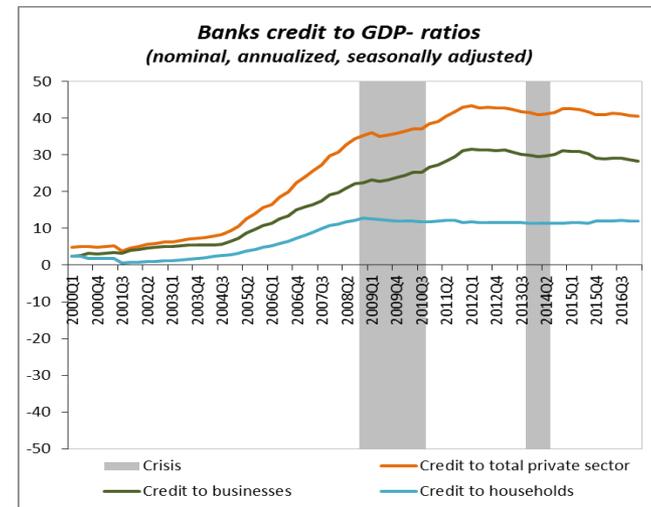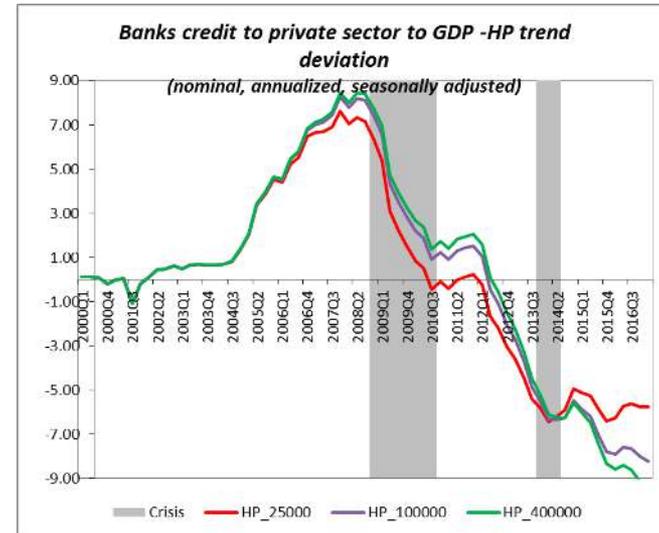*Note: The grey shaded area represents the identified periods of financial distress.*

The first stress event: 'Q3 2008 to Q2 2010'can be divided in two parts:
  ➤ Q3 2008 to Q3 2009- the adverse effects of the global financial crisis
  ➤ Q4 2009 to Q2 2010- the adverse spillover effects of the Greek crisis

The second stress event: Q4 2013 - Q2 2014-a rapid increase in the banks NPLs and deteriorating profitability of banks

Indicators and Data

❑ Credit related indicators taken into analysis:

➢ *Total credit (total private sector, corporates, households)*

➢ *Bank credit (total private sector, corporates, households)*

➢ *Credit to deposits*

❑ Series transformations:

➢ *ratio to GDP (nominal, annualized, seasonally adjusted);*

➢ *credit gaps from long term trend (one sided HP filter, λ = 25.000, 100.000 and 400.000),*

➢ *annual growth rates.*

❑ Threshold choice:

➢ *various thresholds for each indicator: arbitrary choice, based on literature, historical average.*

❑ Data:

➢ *quarterly data, nominal values;*

❑ Leading horizon:

➢ *6 quarters, 8 quarters, 10 quarters and 12 quarters, ahead of crisis, cumulative*

Banks credit to private sector to GDP -HP trend deviation (nominal, annualized, seasonally adjusted)

Crisis — HP_25000 — HP_100000 — HP_400000

Banks credit to GDP- ratios (nominal, annualized, seasonally adjusted)

Crisis — Credit to total private sector — Credit to businesses — Credit to households

Results

- ✓ All credit indicators tend to react before the crisis, but the speed and the magnitude of this reaction differs substantially;

- ✓ Credit gap indicators show better leading indicator properties comparing to the other indicators;

- ✓ Only few indicators fulfill the methodology criteria of optimal leading indicators;

- ✓ Credit to total private sector (corporate+household) –to- GDP gap, seems to have good signaling properties while de-trended with one sided HP filter, with smoothing parameter λ=100.000 and λ= 400.000;

- ✓ The optimal thresholds can be 2 – signaling an *"increased risk"* and 3-signaling *"high risk"*;

- ✓ The indicator performs better with a leading horizon of 8-12 quarters ahead of the crisis.