



BANK PRUDENTIAL BEHAVIOUR - A STATISTICAL ANALYSIS BASED ON THE PRINCIPAL COMPONENT APPROACH

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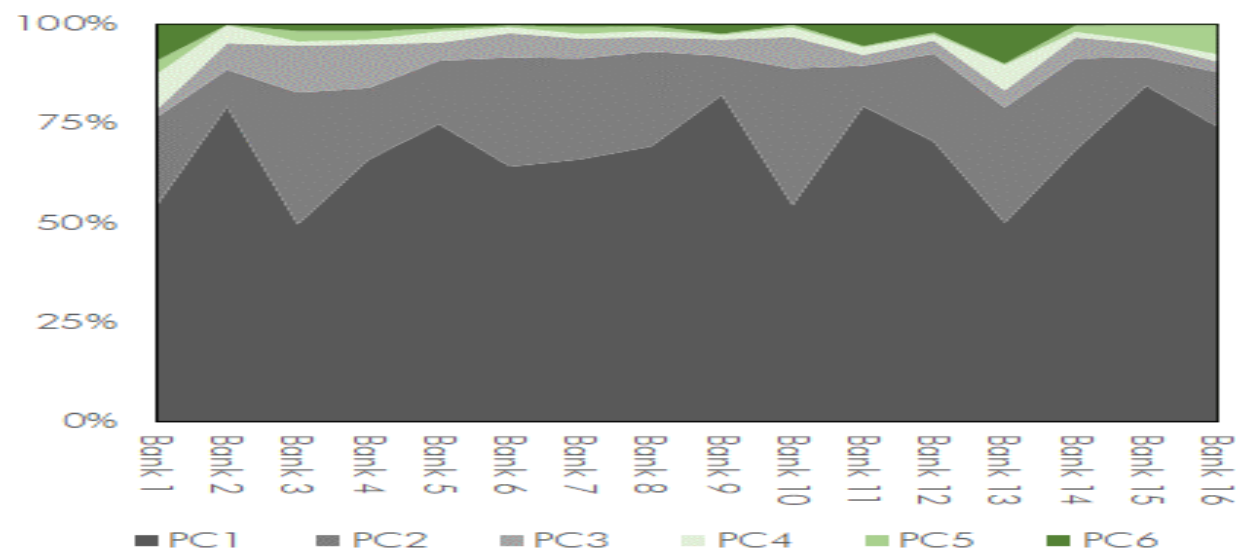
- Bank prudential behaviour (BPB) is mostly studied under the Basel criterion (e.g. *financial leverage indicators, capital and liquidity requirements, or/and loan loss provisions indicators*).
- **BUT**, in common parlance, BPB should be portrayed as an un-observable attitude, which:
 - Guards banking sector to operate prudentially from a stability point of view so that to reduce the likelihood that one of them will fail.
 - Goes beyond what Dale (1984) and Jatanti, *et al.*, (1996) call preventive and protective regulations [e.g. *capital and liquidity risks*, or *deposit insurance*].
 - Most importantly, as Crockett (2000) and Flannery (1995) suggest, it is also a:
 - Policy cap objective to avoid other sort of risks (e.g. *credits risks, imprudently large exposure, gap maturities, net open position*), which are the supervision regulated components by law and regulation, **but are not part of the minimum CAR criterion**, and that are defined as 'prudential' in this paper.
 - Self-reflection on other rule and non-rule based self-perception of banks' management:
 - On the quality of their asset and liability portfolio individual banks have at a given point of time.
 - And how they understand and behave with regards to the rule-based limitations imposed.

Table 1. Indicators used to estimate a BPB index for each individual bank.

	Category	Description of the indicator	Symbols		Methodology
1.	Liquidity ratio indicators (LIQ)	Active liquids / assets Liquids / bank deposit with a maturity of less than 12months Cash coverage ratio Net loan / average deposits Liquidity Management Quality Ratio Deposit Concentration Ratio	X_{LIQ_1} X_{LIQ_2} X_{LIQ_3} X_{LIQ_4} X_{LIQ_5} X_{LIQ_6}	Z_{LIQ}^*	Principal Components Analysis Approach
2.	Capital ratio indicators (CAP)	Capital Adequacy Ratio Discretionary Capital Adequacy Ratio Asset Coverage Ratio Leverage ratio Tier 1 capital	X_{CAR_1} X_{CAR_2} X_{CAR_3} X_{CAR_4} X_{CAR_5}	Z_{CAP}^*	
3.	Net Open Foreign Position / assets (NOFP)		Z_{NOFP}^*		
4.	Gap to maturity / assets (GAP)		Z_{GAP}^*		
5.	Loan concentration ratio (CR)	Structure Maturity Sectors Purpose Economic activity	X_{CR_1} X_{CR_2} X_{CR_3} X_{CR_4} X_{CR_5}	Z_{CR}^*	
6.	Bank Provisional Indicators (BP)	Provisional coverage ratio Loan loss reserve / excessive loan (Gross) Loan loss provisions / risk-weighted assets Loan loss reserve expenditure / assets Loan loss reserve expenditure / Net Operating Income Off-balance sheet activities / assets	X_{BP_1} X_{BP_2} X_{BP_3} X_{BP_4} X_{BP_5} X_{BP_6}	Z_{BP}^*	

Source: Bank of Albania, Author's calculations.

Graph 1. The proportion of variability according to each component.



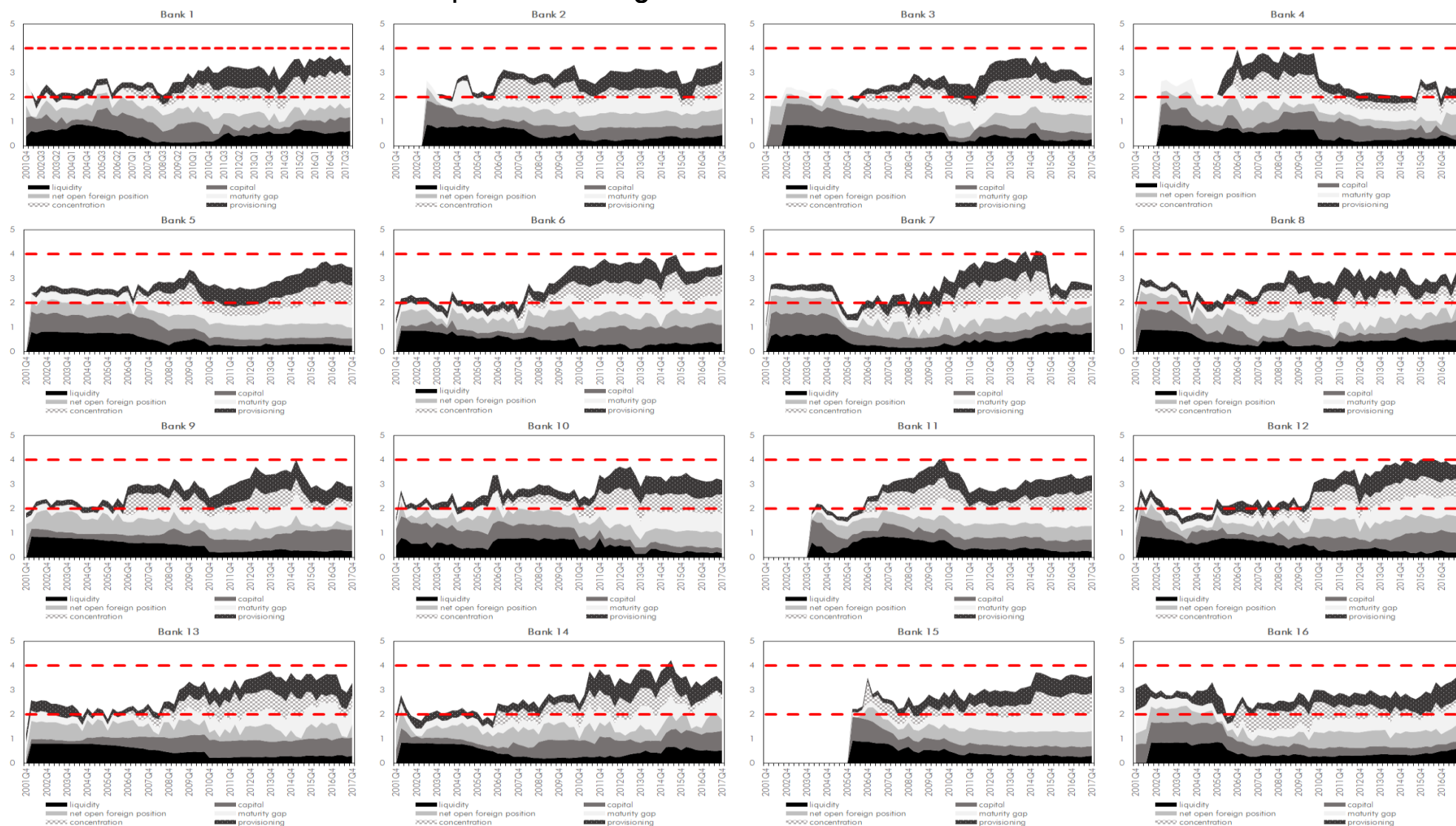
Source: Author's calculations

Table 2. The degree of explanatory of each PCs

	PC1	PC2	PC3	PC4	PC5	PC6
Banking System	68.0%	20.3%	5.3%	2.5%	1.7%	2.1%
Large Banks	66.4%	20.1%	4.1%	3.8%	3.6%	2.1%
Small Banks	69.1%	20.5%	6.2%	1.5%	1.5%	1.3%

Source: Author's calculations

Graph 2. The degree of BPB over 2002 - 2017.



Source: Author's calculations

Table 3. Correlation Test Analysis, 2006 Q1 – 2008 Q3.

	Large Banks Highest Correlation						Small Banks Highest Correlation					
	CAR	LIQ	NOP	GAP	CR	LLP	CAR	LIQ	NOP	GAP	CR	LLP
0.680	11%	11%	11%	11%	23%	0%	0%	20%	0%	0%	14%	34%
0.203	3%	3%	3%	0%	10%	0%	4%	8%	0%	0%	8%	0%
0.053	3%	0%	1%	0%	1%	1%	3%	1%	0%	0%	2%	1%
0.025	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%
0.017	0%	1%	1%	0%	0%	0%	1%	1%	0%	0%	0%	0%
0.021	0%	0%	1%	0%	0%	1%	0%	1%	0%	0%	0%	0%
sum	19%	16%	17%	12%	34%	2%	7%	31%	1%	0%	25%	35%
	3	2	4	5	1	6	4	2	5	6	3	1

Source: Author's calculations

Table 4. Correlation Test Analysis, 2008 Q4 – 2017 Q4.

	Large Banks Highest Correlation						Small Banks Highest Correlation					
	CAR	LIQ	NOP	GAP	CR	LLP	CAR	LIQ	NOP	GAP	CR	LLP
0.680	11%	0%	0%	34%	0%	23%	0%	0%	0%	41%	0%	27%
0.203	0%	0%	3%	0%	10%	7%	4%	4%	0%	0%	10%	2%
0.053	1%	2%	1%	1%	0%	1%	2%	2%	1%	0%	1%	0%
0.025	0%	0%	0%	1%	1%	0%	1%	1%	0%	0%	0%	0%
0.017	0%	1%	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%
0.021	1%	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	1%
sum	14%	3%	6%	36%	11%	31%	7%	8%	2%	41%	12%	30%
	3	5	6	1	4	2	5	4	6	1	3	2

Source: Author's calculations

Table 5. Cross-section analysis based on the sample mean value of BPB index.

	Sample Mean					Positive Episodes				
	System	Large Banks	Small Banks	Foreign	Domestic	System	Large Banks	Small Banks	Foreign	Domestic
Sample	101.5	103.4	100.9	102.8	95.8					
Pre-2008 Q3	89.0	89.8	88.4	90.5	82.7					
After-2008 Q3	106.4	109.5	105.3	107.8	100.8					
after 2012 Q1	109.1	113.1	107.7	110.3	103.9					
Before 2008 Q3 Vs All Sample						19%	0%	20%	23%	0%
After 2008 Q3 Vs All Sample						94%	100%	90%	92%	100%
After 2012 Vs All Sample						81%	83%	80%	77%	100%
After 2008 Q3 Vs Pre-2008 Q3						81%	100%	80%	77%	100%
After 2012 Vs 2008-2012						75%	83%	70%	69%	100%

Source: Author's calculations

Table 6. Cross-section analysis on sample episodes.

	Positive Episodes				Negative Episodes			
	Total Sample	Before 2008 Q4	After 2008 Q4	2012 - 2017	Total Sample	Before 2008 Q4	After 2008 Q4	2012 - 2017
Banking System	49%	6%	94%	56%	55%	18%	82%	20%
Large `Banks	45%	5%	95%	62%	57%	19%	81%	19%
Small Banks	51%	7%	93%	53%	54%	17%	83%	20%
Foreign	46%	6%	94%	55%	55%	18%	82%	22%
Domestic	62%	8%	92%	58%	54%	19%	81%	12%

Source: Author's calculations