FACTORS AFFECTING THE FINANCIAL STABILITY OF VIETNAMESE COMMERCIAL BANKS

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Appendix 1. Describe the variables and expected sign

Symbol	Variable name	Measure	Sign expectations	Research
Dependent variable				
lnZ-score	lnZ-score	lnZ-score = ln $\left(\frac{\text{ROA} + \frac{E}{A}}{\sigma(\text{ROA})}\right)$		Abuzayed et al. (2018), Boyd et al. (2006), Fernández et al. (2016)
Independent variables				
SIZE	Bank size	ln(total assets)	+	Adusei (2015), Chand et al. (2021)
ROE	Return on equity	Net income / average equity	+	Chand et al. (2021), Schaeck and Cihák (2014)
NPL	Non-performing loan	(Debt group 3 + debt group 4 + debt group 5) / total loans	-	Abuzayed et al. (2018), Fernández et al. (2016), Dwumfour (2017)
CAR	Capital adequacy ratio	Equity/risk assets	+	Nguyen Duc Trung and Nguyen Hoang Chung (2018), Yen and Ngan (2016), Vandenbussche et al. (2015)
LDR	Loan to deposit ratio	Total outstanding loans/total deposits	-	Nguyen Duc Trung and Nguyen Hoang Chung (2018), Yen and Ngan (2016)
NII	Ratio of non-interest income to total income	Non-interest income/total income	+	Nguyen Minh Sang et al. (2018), Oniang'o (2015)
INF	Inflation	[CPI(t) – CPI(t-1)] / CPI(t-1)	-	Abuzayed et al. (2018), Chen et al. (2017), Diaconu and Oanea (2014),
GDP	Economic growth rate	[GDP(t) – GDP(t-1)] / GDP(t-1)	+	Abuzayed et al. (2018), Chen et al. (2017), Diaconu and Oanea (2014), Ngambou Djatche (2019)

Appendix 2. Results of descriptive statistics

Variable	Observation	Mean	Standard deviation	Min	Max
LnZ-score	275	4.0139	1.0406	1.1593	8.9899
SIZE	275	18.8085	1.0835	16.5023	21.4326
ROE	275	0.1090	0.0788	-0.1314	0.3033
NPL	275	0.0217	0.0220	0.0047	0.2976
CAR	275	0.1272	0.0322	0.0811	0.2798
LDR	275	0.8988	0.1672	0.3719	1.4691
NII	275	0.2271	0.1735	0.0255	2.3297
INF	275	0.0321	0.0140	0.0063	0.0660
GDP	275	0.0580	0.0164	0.0260	0.0802

Appendix 3. Correlation coefficient matrix between variables

Variable	LnZ-score	SIZE	ROE	NPL	CAR	LDR	NII	INF	GDP
LnZ-score	1.0000								
SIZE	0.0226	1.0000							
ROE	-0.1885	0.6484	1.0000						
NPL	-0.0372	-0.1512	-0.3321	1.0000					
CAR	0.0237	-0.3880	-0.2823	0.0681	1.0000				
LDR	-0.1203	0.3103	0.4984	-0.1338	-0.0463	1.0000			
NII	-0.0839	0.1538	0.0538	0.0794	0.0783	0.0124	1.0000		
INF	-0.2283	-0.1353	-0.1021	0.1406	0.1284	-0.1395	0.1450	1.0000	
GDP	-0.0198	-0.0918	-0.0710	0.0136	0.0968	-0.0623	-0.0295	0.0307	1.0000

Appendix 4. Results of the multicollinearity **test**

Variable	VIF	1/VIF
ROE	2.30	0.4341
SIZE	1.97	0.5070
LDR	1.32	0.7579
CAR	1.24	0.8051
NPL	1.20	0.8302
NII	1.09	0.9203
INF	1.08	0.9286
GDP	1.02	0.9833
Mean VIF	1.40	

Appendix 5. Results of Durbin Wu-Hausman test

Variable	Durbin	Wu-Hausman
LnZ-score (t-1)	p = 0.2911	p = 0.3036
SIZE	p = 0.9042	p = 0.9065
ROE	p = 0.5243	p = 0.5342
NPL	p = 0.0007	p = 0.0008
CAR	p = 0.2250	p = 0.2356
LDR	p = 0.3929	p = 0.4041
NII	p = 0.6665	p = 0.6741
INF	p = 0.0455	p = 0.0501
GDP	p = 0.4583	p = 0.4689