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Bank capital and lending behavior : empirical evidence for Italy

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Discussion by

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Benefits of the paper

- Extensive review of litterature on bank capital and business cycle
- Use of a unique non US dataset over a long time period
- Models and Distinguishes “bank credit channel” from “bank capital channel”
- Introduces a proxy for risk based capital (“excess capital”)
- Tries to capture portfolio’s structure on banks capital

Results obtained

- Well capitalised banks can better shield from MP shocks
- Evidence of a bank capital channel is provided noticeably for CCBs
- Capitalisation influences the way banks react to GDP shocks
- Lending from well capitalised banks is less procyclical

Outline of Discussion

- Theoretical modelling
  - definition of excess capital ?
  - Bank credit channel and capital channel ?
- Results
  - procyclicality of large banks ?
- Perspective for Basel 2
  - Preliminary work on the procyclicality of Basel2

The theoretical Model

$$L^s = \Psi_0 + \Psi_1 p + \underbrace{(\Psi_2 + \Psi_3 X) i_m}_{\text{credit channel}} + \underbrace{(\Psi_4 + \Psi_5 X) y}_{\text{business cycle}} + \underbrace{\Psi_6 \rho \Delta i_m}_{\text{capital channel}}$$

$$X = K - R$$

- X = Excess capital, K total capital, R minimum regulatory capital
- If R is optimal, then X is invested into **risk free** assets
- X is rather a proxy for market risk exposure than for credit risk exposure

The theoretical Model

$$L^s = \Psi_0 + \Psi_1 p + \underbrace{(\Psi_2 + \Psi_3 X) i_m}_{\text{credit channel}} + \underbrace{(\Psi_4 + \Psi_5 X) y}_{\text{business cycle}} + \underbrace{\Psi_6 \rho \Delta i_m}_{\text{capital channel}}$$

- If R is not optimal, then X is a proxy for market risk exposure **and** credit risk exposure

$$X = \underbrace{(K - K^*)}_{X^* \text{ market risk}} + \underbrace{(K^* - R)}_{\text{Credit Risk bias}}$$

- Total capital more consistent as a proxy for economic capital

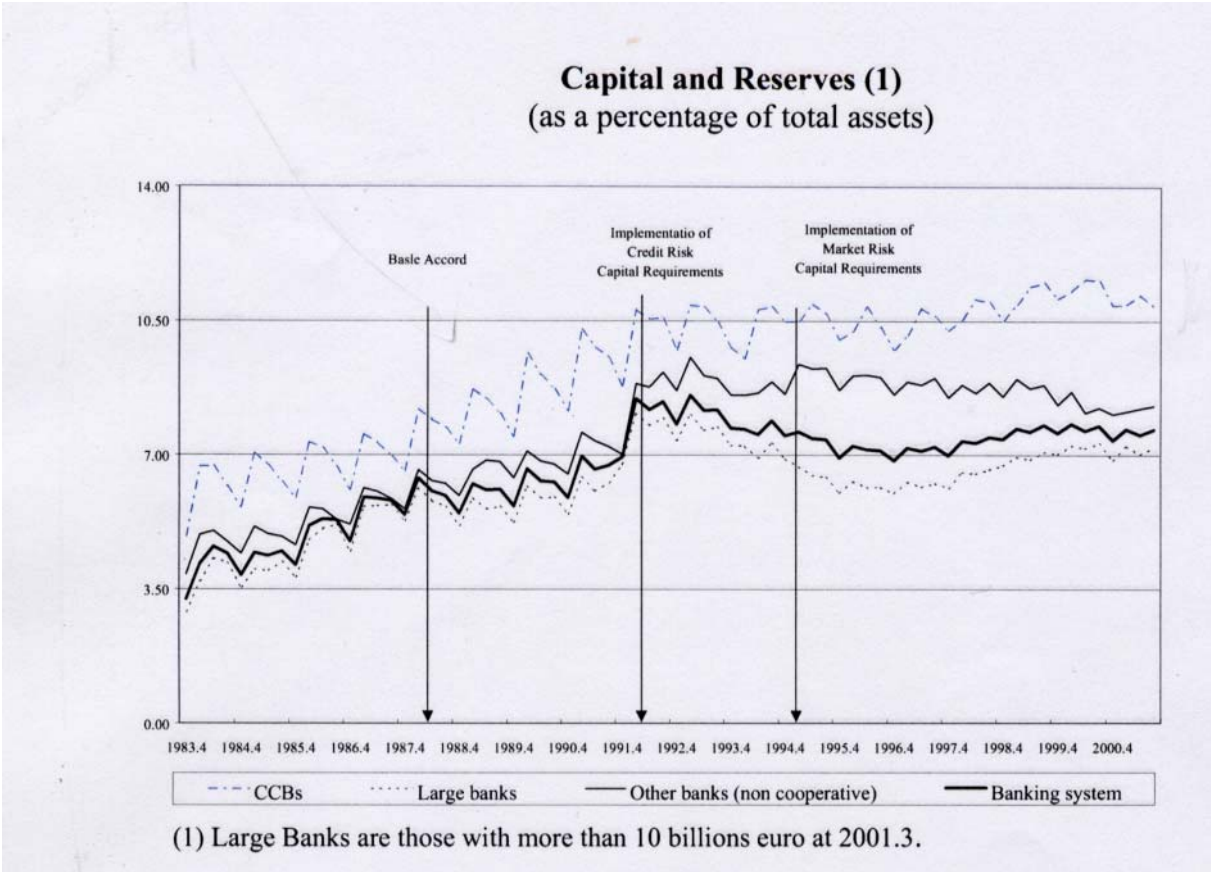
The theoretical Model

$$L^s = \Psi_0 + \Psi_1 p + \underbrace{(\Psi_2 + \Psi_3 X) i_m}_{\text{credit channel}} + \underbrace{(\Psi_4 + \Psi_5 X) y}_{\text{business cycle}} + \underbrace{\Psi_6 \rho \Delta i_m}_{\text{capital channel}}$$

- Bank capital channel = transformation cost ?
- Incidence of banks' (excess) capital on banks' risk aversion ?

The econometric Model

- Excess capital shows strong seasonality



The results

- Some clarification needed
- well capitalised banks (capital >8%) are less procyclical
  - p 24 “Well capitalised banks can better shield their lending from MP shocks…Again the credit supply of well capitalised banks is less procyclical.”
- But risky banks (capital >8%) are procyclical
  - p 24 “Exogenous capital shocks, due to the disposal of a specific (higher than 8%) solvency ratio for highly risky banks, determine an overall reduction of 20% in lending after two years. This result is consistent with the hypothesis that it costs less to adjust lending than capital”

The results

- Binding risk based capital requirements are likely to be procyclical
- The main concern to supervisors is whether this procyclicality is « excessive » with respect to credit cycle
- Stiglitz & Weis, 1981 : in markets with imperfect information, non optimal credit supply (credit rationing) may exist at equilibrium.

Interest of the paper

- Use of CCR as useful benchmarks to assess banks lending behaviour
- Highlights the need to link the dynamics of banks capital requirements and banks lending behaviour
- Can procyclical risk based capital standards lead to non optimal credit cycle ?

How about Basel2 ?

- Basel2 IRB capital requirements as risk sensitive measures are likley to be procyclical

Assuming the Transition matrix governs the portfolio dynamics, future capital requirements are obtained from rating migrations in the initial portfolio Z_t, and from new credit flows V_t . In a dynamic form, the portfolio dynamics seems compatible with the following process

$$Z_{t+1} = \Pi'_t \cdot Z_t + \nu_t + \eta_t$$

$$\eta_t \sim N(0, Q)$$

« Bank capital channel » and Procyclicality

- Modelling the dynamics with a state-space model :

$$\begin{cases} K_t = RW' \cdot Z^*_t + e_t & \text{measurement equation (capital constraint)} \\ Z^*_t = \Pi'_t \cdot Z^*_{t-1} + \nu + \eta_t & \text{transition equation (portfolio dynamics)} \end{cases}$$

$$E(e_t) = 0$$

$$E(\eta_t) = 0$$

model parameters and hypothesis

$$V(e_t) = h$$

$$V(\eta_t) = Q$$

What to benchmark ? (cont')

- The State-space form model allows to link dynamics of capital requirements and IRB parameters and can be used in different ways depending on data availability:
  - Fit minimum capital requirements K, Bank 's risk estimates RW and transition matrix Π as benchmark and derive Risk distribution Z
  - Fit minimum capital requirements K, Bank 's risk estimates RW as benchmark, and derive Risk distribution Z and transition matrix Π (need for a reduced form)
  - Mix

How to analyse benchmarks ?

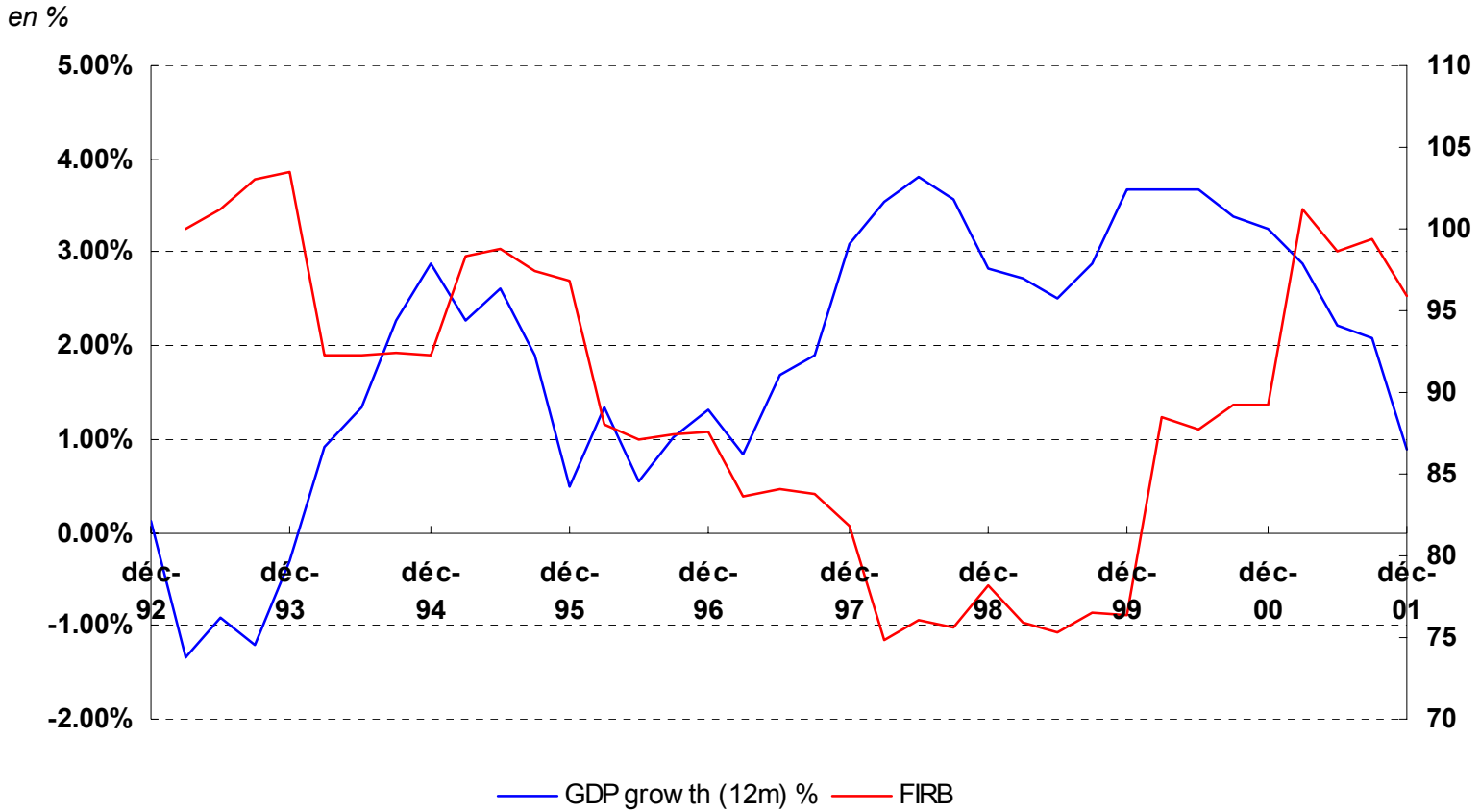
- Regress the serie of theoretical portfolios obtained on benchmark portfolios to analyse their correlation

$$Z_t^* = \alpha + \beta \cdot Z_t + \varepsilon_t$$

- Analyse and test regression results and parameters (α=0?, β=1?) accross risk buckets
- Infer conclusions on plausibility of inputs and potential procyclicality of IRB system analysed

Example (cont')

FIRB K variations and GDP



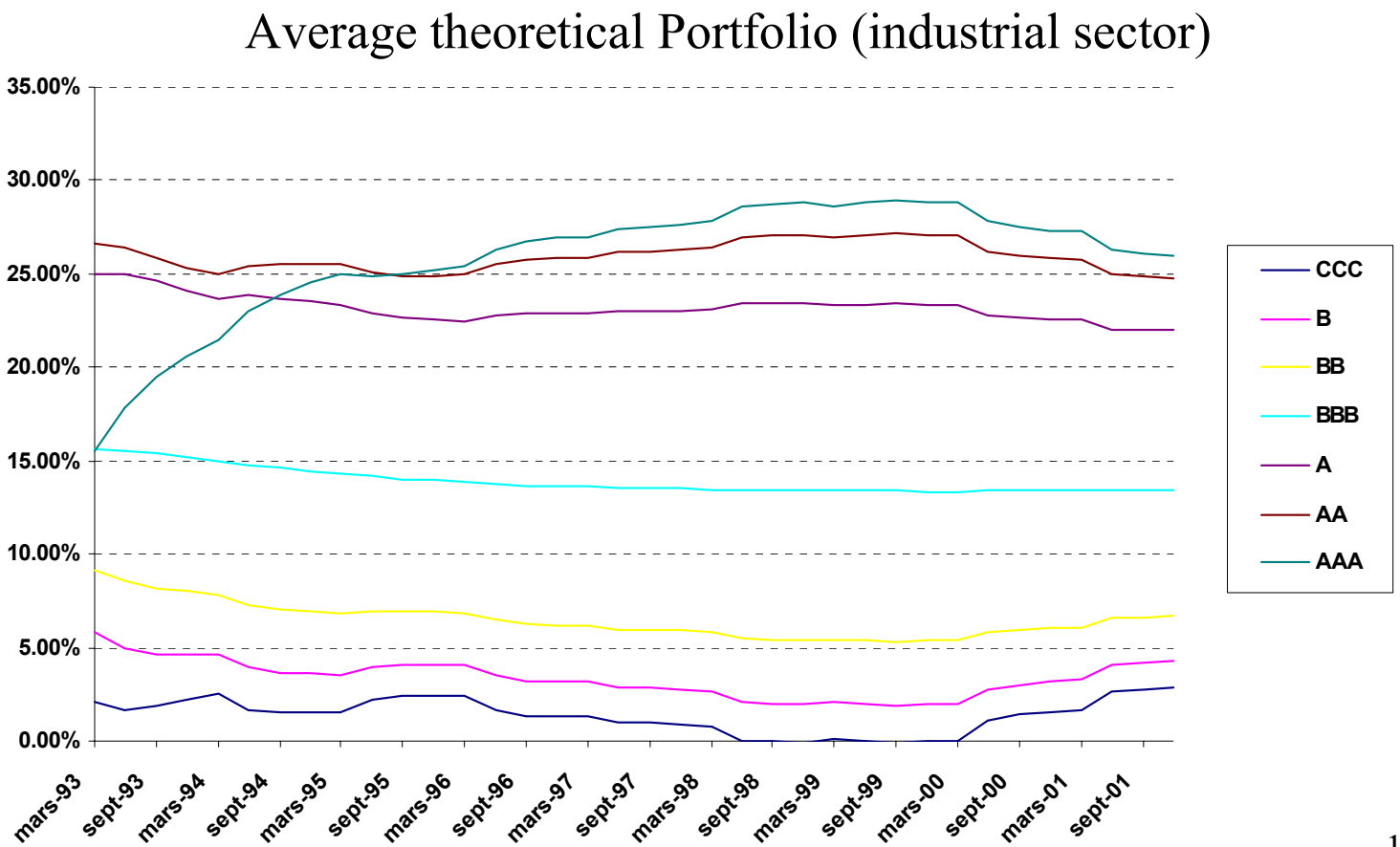
Example (cont')

model $Z^i_t = \alpha + \beta.Z^i_t* + \varepsilon_t$

	CCC	B	BB	BBB	A	AA	AAA
Alpha	***0.0046**	0.0106	***-0.0298**	***-0.1690**	-0.0056	0.0629	-0.1037
t statistic	2.56	0.73	-2.17	-2.75	-0.07	0.48	-2.21
Beta	***0.4282**	***1.1960**	***1.4743**	***2.2283**	***1.0030**	****0.9604**	***1.1529**
t statistic	3.93	2.84	7.04	5.04	2.86	1.91	6.38
R^2	0.2918	0.1680	0.5812	0.4109	0.1705	0.0704	0.5313
RMSE	0.0059	0.0248	0.0121	0.0182	0.0149	0.0230	0.0348
F statistic	15.42	8.07	49.57	25.41	8.19	3.65	40.68
Prob > F	0.0004	0.0076	<.0001	<.0001	0.0072	0.0645	<.0001

*, **, ***, significant at the 1%, 5% et 10% confidence

Example (cont')



Example (cont')