What are banks’ actual capital targets?

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European Central Bank

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Motivation

- How firms choose their target capital structure and how they reach it are key questions in financial economics.

- Critical issues for banks: (i) credit suppliers and (ii) capital regulation.

- The Great Financial Crisis highlighted the need for larger and countercyclical bank capitalisation to avoid credit crisis.

- Target capital ratios have long been undisclosed, forcing researchers to rely on noisy estimates.

- Need for observable targets analysis to revisit how targets are formed and how they affect banks’ behavior.
This paper

- Introduces a manually collected dataset on target capital ratios European banks announce to their investors

- Assesses the determinants of those targets ⇒ regulatory requirements and procyclical behavior affect targets

- Shows that banks take their targets seriously ⇒ they converge to them, and way faster when initially below them

- Exhibits banks' balance-sheet adjustments to reach their targets ⇒ mostly with the stock of capital, but also material impact on credit supply
Literature and contribution

- Determinants of banks' capital ratios: seminal Flannery and Rangan (2008), Gropp and Heider (2010)
- Impact of distance to target on balance-sheet adjustment: mostly macro (Mésonnier and Stevanovic (2017)), fewer micro (Berrospide et al. (2010); De Jonghe and Öztekin (2015))
- Impact of capital requirements on credit growth: Aiyar et al. (2016); Jacques and Nigro (1997); papers using target as a channel mostly on UK experience de Ramon et al. (2016); Francis and Osborne (2012)

This paper contributes to the literature with:
- Observed vs unobserved targets $\Rightarrow$ better estimates
- Impact of the different types of capital requirements
- Exploration of asymmetry
From implicit targets...

1. Target CET1 ratio depends on explanatory variables $X$:

$$CET_{1i,t+1}^* = \theta X_{i,t}$$ (1)

2. Sluggish Adjustment toward target

$$CET_{1i,t+1} = \lambda CET_{1i,t+1}^* + (1 - \lambda) CET_{1i,t}$$ (2)

3. Injecting (1) in (2) and rearranging:

$$CET_{1i,t+1} = \alpha CET_{1i,t} + \beta X_t + u_{i,t}, \quad \lambda = 1 - \alpha, \quad \theta = \frac{\beta}{1 - \alpha}$$ (3)

4. Giving:

$$\widehat{CET}_{1i,t+1} = \frac{\hat{\beta}}{1 - \hat{\alpha}} X_{i,t}$$

5. Next, impact of distance to target estimated using

$$\Delta Y_{i,t} = \gamma (CET_{1i,t-1} - \widehat{CET}_{1i,t-1}^*) + \delta Z_{i,t-1} + \epsilon_{i,t},$$ (4)
... to explicit targets

1. Target as variable of interest:

   \[ \text{Target}_{i,t+1} = \zeta X_{i,t} + \kappa_i + \eta_{i,t+1}, \]  

   Elasticities recovered with direct regressions \(\Rightarrow\) lower estimation uncertainty

2. Target as an explanatory variable:

   \[ \Delta Y_{i,t} = \chi \text{Gap}_{i,t-1} + \psi Z_{i,t-1} + \nu_i + \epsilon_{i,t}, \]  

   Explicitly announced targets \(\Rightarrow\) no regressor uncertainty (model choice and estimation noise)
Announced target CET1 ratios: examples

**Figure:** Examples of announced target CET1 ratios

### Group’s 2020 Business Development Plan
**Financial Targets**

<table>
<thead>
<tr>
<th>Category</th>
<th>2020 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Growth</strong></td>
<td>Revenue growth</td>
</tr>
<tr>
<td>2016-2020 CAGR(1)</td>
<td>+2.5%</td>
</tr>
<tr>
<td><strong>Efficiency</strong></td>
<td>Plan’s savings target</td>
</tr>
<tr>
<td>Cost income ratio</td>
<td>2016: 66.8%(2)</td>
</tr>
<tr>
<td>2020 Target</td>
<td>~€2.7bn in recurring cost savings starting from 2020</td>
</tr>
<tr>
<td>63%</td>
<td></td>
</tr>
<tr>
<td><strong>Profitability</strong></td>
<td>ROE</td>
</tr>
<tr>
<td>2016: 9.4%(2)</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Capital</strong></td>
<td>Pay-out ratio</td>
</tr>
<tr>
<td>2016: 45%(2)</td>
<td>50%</td>
</tr>
</tbody>
</table>

- Average growth of dividend per share(2) > 9% per year (CAGR) until 2020
- An ambitious plan that aims to generate an average increase in net income > 6.5% a year until 2020

### CaixaBank
**Strategic Plan 2019 – 2021**

**Strong capital position to be reinforced through 2019-2021E**

- 12% CET1 target
  - 2019E-21E
  - +1 pp buffer by 2021E

- Recent stress test proved our resilience in adverse scenarios

### CET1 ratios for Spanish banks vs. SREP requirement FL (1), in %

<table>
<thead>
<tr>
<th>CET1 2020 Adverse</th>
<th>CET1 2017 FL</th>
<th>SREP requirement (CET1% FL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer 1</td>
<td>9.1%</td>
<td>12.0%</td>
</tr>
<tr>
<td>Peer 2</td>
<td>9.00%</td>
<td>10.7%</td>
</tr>
<tr>
<td>Peer 3</td>
<td>9.25%</td>
<td>10.6%</td>
</tr>
<tr>
<td>CaixaBank</td>
<td>11.5%</td>
<td>12.0%</td>
</tr>
</tbody>
</table>

Source: Banks’ websites

The collected dataset covers:

- 1346 quarterly observations of 74 banks over Q1 2014 - Q4 2021
- ~66% of total assets of European banks since 2018 (~40% in 2014)
Announced targets CET1 ratios: levels

Figure: Banks’ target CET1 ratios - %

- Targets’ interval has stabilized since 2018
- They are largely concentrated in a 12.5% - 15% interval
- They have not strongly reacted to the Covid-19 crisis...
- ...but some adjustment is visible in the tails

Source: Banks’ websites, author’s calculations
Announced target CET1 ratios: distance to targets

Figure: Distance of banks CET1 ratios to targets

Source: Banks’ websites, author’s calculations

- 2014-2016: rebuild weakened balance-sheets
- 2017-2019: stabilisation
- since 2020: above targets (policy intervention), payouts expected
Announced targets CET1 ratios: impact of requirements

**Figure:** Overall Capital Requirements vs. Targets

- Targets increase with requirements
- Partial adjustment only

*Source:* Banks’ websites, author’s calculations
Announced targets CET1 ratios: convergence to the targets

**Figure:** Distance to the target since its announcement

- Convergence on both sides...
- ... but much faster for banks below their targets

*Source:* Banks’ websites, author’s calculations
Specification: Econometric settings

1. **Target determinants:**

\[ \text{Target}_{i,t+1} = \zeta X_{i,t} + \kappa_i + \eta_{i,t+1}, \]  

(7)

2. **Speed of adjustment:**

\[ \text{Gap}_{i,t} = \tau \text{Gap}_{i,t-1} + u_{i,t}, \]  

(8)

3. **Impact of distance to target:** channels of adjustment

\[ \Delta Y_{i,t} = \chi \text{Gap}_{i,t-1} + \psi Z_{i,t-1} + \nu_i + \epsilon_{i,t}, \]  

(9)

4. **Impact of distance to target:** credit supply during COVID

\[ \Delta y_{i,j} = \vartheta \text{Gap}_i + \varphi W_{i,j} + v_j + \nu_{i,j}, \]  

(10)
Specification: Data

- Bank level data (COREP/FINREP: supervisory data)
  - CET1 regulatory requirement
  - Size: total asset (in log)
  - Profitability: return on asset
  - Liquidity: liquid assets ratio
  - Business model: diversification
  - Deposits: deposit ratio
  - Asset quality: risk weight density, impaired asset ratio, provision ratio

- Macrofinancial environment
  - Economic forecast: 1-year ahead domestic real GDP growth and inflation forecast (Consensus Forecast)
  - Monetary policy: ECB policy rate (3-month Euribor) & TLTRO ov. total asset
  - 10-year sovereign rate
Banks’ capital requirements

- After the GFC, banks’ capital requirements were reformed (Basel III)
- Composed of three blocks of diminishing stringency
  - Minimum requirements (TSCR), to be met at all times
  - Buffers (CBR), in which banks can draw at the expense of dividends
  - P2G, which is a demand and not a requirement per se
- Less stringent requirements should affect less targets, as the cost of breach is lower

Diagram:

- MDA trigger
- OCR
- Combined buffer requirement
- Pillar 2 guidance
- TSCR
- Pillar 2 requirement
- Own funds demand
- Pillar 1 requirement
## Results: Target determinants

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variable:</strong></td>
<td><strong>Target</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCR w. P2G</td>
<td>0.5669***</td>
<td>0.2565***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.1205)</td>
<td>(0.0812)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum req.</td>
<td></td>
<td>0.6729***</td>
<td>0.0386</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.1451)</td>
<td>(0.0920)</td>
<td></td>
</tr>
<tr>
<td>Buffers</td>
<td></td>
<td>0.7855***</td>
<td>0.5818***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.2269)</td>
<td>(0.1494)</td>
<td></td>
</tr>
<tr>
<td>P2G</td>
<td>-0.2537</td>
<td>0.0110</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.2720)</td>
<td>(0.1533)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP growth forecast</td>
<td>-0.584**</td>
<td>-0.834***</td>
<td>-0.402</td>
<td>-0.866***</td>
</tr>
<tr>
<td></td>
<td>(0.255)</td>
<td>(0.209)</td>
<td>(0.279)</td>
<td>(0.219)</td>
</tr>
<tr>
<td>Control variables</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bank FE</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>1,071</td>
<td>1,071</td>
<td>1,071</td>
<td>1,071</td>
</tr>
</tbody>
</table>

- Significant but $< 1$ elasticity to requirement $\Rightarrow$ trade-off between expected cost of breach and (perceived) costly CET1
- Banks treat buffers like strict requirements $\Rightarrow$ failure of Basel III?
- Signs of procyclical adjustment $\Rightarrow$ consistent with market pressure
Observed targets provide material improvement over implicit targets:

- Credible point estimates
- Direct confidence intervals
Result: Speed of adjustment

<table>
<thead>
<tr>
<th>distance to Target</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>dist. Target</td>
<td>0.955***</td>
<td>0.980***</td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td>(0.011)</td>
</tr>
<tr>
<td>dist. Target pos.</td>
<td></td>
<td>0.980***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.011)</td>
</tr>
<tr>
<td>dist. Target neg.</td>
<td></td>
<td>0.834***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.030)</td>
</tr>
</tbody>
</table>

Wald test dist. = 1: 11.63***
Wald test pos. dist. = 1: 3.71*
Wald test neg. dist. = 1: 30.74***
Wald test pos. dist. = neg. dist.: 21.75***

• Autocorrelation coef. in (0, 1): banks are serious about their targets
• Adjustment occurs for CET1 ratios both below and above targets...
• ...but is much faster for banks below targets ⇒ higher market pressure
### Results: balance-sheet adjustment 1/2

CET1 ratio adj. occurs through both numerator and denominator
- 2/3 of the adjustment through the stock of capital
- 1/3 through assets, in particular corporate exposures

<table>
<thead>
<tr>
<th>Model:</th>
<th>CET1 ratio</th>
<th>CET1 €</th>
<th>Issued capital</th>
<th>Retained earnings</th>
<th>RWA</th>
<th>TA</th>
<th>NFC loans</th>
<th>HH loans</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
</tr>
<tr>
<td>Target dist.</td>
<td>-0.2346***</td>
<td>-0.9964***</td>
<td>-0.1292**</td>
<td>-1.7163**</td>
<td>0.4666***</td>
<td>0.2621**</td>
<td>0.2622*</td>
<td>0.2004**</td>
</tr>
<tr>
<td></td>
<td>(0.0220)</td>
<td>(0.1265)</td>
<td>(0.0618)</td>
<td>(0.8388)</td>
<td>(0.0922)</td>
<td>(0.1089)</td>
<td>(0.1425)</td>
<td>(0.0932)</td>
</tr>
<tr>
<td>Control variables</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Fixed-effects</td>
<td>Bank</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Country x Qtr</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

- **CET1 ratio adj.** occurs through both numerator and denominator
- **2/3 of the adjustment** through the stock of capital
- **1/3 through assets**, in particular corporate exposures
### Results: balance-sheet adjustment 2/2

<table>
<thead>
<tr>
<th>Model:</th>
<th>CET1 ratio (1)</th>
<th>CET1 € (2)</th>
<th>Issued capital (3)</th>
<th>Retained earnings (4)</th>
<th>RWA (5)</th>
<th>TA (6)</th>
<th>NFC loans (7)</th>
<th>HH loans (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target dist. pos</td>
<td>-0.1960**</td>
<td>-0.5968***</td>
<td>0.01920</td>
<td>-0.1347</td>
<td>0.4388***</td>
<td>0.2622*</td>
<td>0.0196</td>
<td>-0.0385</td>
</tr>
<tr>
<td></td>
<td>(0.0304)</td>
<td>(0.1705)</td>
<td>(0.0866)</td>
<td>(1.1373)</td>
<td>(0.1245)</td>
<td>(0.1089)</td>
<td>(0.2121)</td>
<td>(0.1314)</td>
</tr>
<tr>
<td>Target dist. neg</td>
<td>-0.2310**</td>
<td>-1.2490***</td>
<td>-0.2061**</td>
<td>-2.6745**</td>
<td>0.3146**</td>
<td>0.2717*</td>
<td>0.4288**</td>
<td>0.3638***</td>
</tr>
<tr>
<td></td>
<td>(0.0335)</td>
<td>(0.1883)</td>
<td>(0.0955)</td>
<td>(1.2617)</td>
<td>(0.1373)</td>
<td>(0.1642)</td>
<td>(0.1854)</td>
<td>(0.1449)</td>
</tr>
</tbody>
</table>

**Control variables**
- Yes

**Fixed-effects**
- Bank: Yes
- Country x Qtr: Yes

- Adjustment again occurs both below and above targets
- Adjustment through credit to NFCs concentrated on banks below their target
Results: Robustness

Results are robust to the following settings:

- Control by the distance to the capital requirements $\Rightarrow$ targets matter on their own & capture most of the effect of the requirements
- Exclude 2020 from the sample period (Covid-19 crisis)
- Add time fixed effects
- Pooled regressions w/o intercept (no permanent drift)
### Results: Credit supply during COVID

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Δ credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model:</td>
<td>(1)</td>
</tr>
<tr>
<td>Target dist.</td>
<td>0.0175**</td>
</tr>
<tr>
<td></td>
<td>(0.0078)</td>
</tr>
<tr>
<td>Target dist. pos.</td>
<td>-0.0050</td>
</tr>
<tr>
<td></td>
<td>(0.0163)</td>
</tr>
<tr>
<td>Target dist. neg.</td>
<td>0.0288**</td>
</tr>
<tr>
<td></td>
<td>(0.0126)</td>
</tr>
<tr>
<td>Firm FE</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Fit statistics**

<table>
<thead>
<tr>
<th>Observations</th>
<th>580,725</th>
<th>580,725</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R^2$</td>
<td>0.65335</td>
<td>0.65346</td>
</tr>
</tbody>
</table>

- The distance to target had a substantial impact on credit supply.
- Stronger impact for banks below their target.
Conclusion

- Target capital ratios are (increasingly) crucial in bank communication

- Targets are driven by capital requirements (trade-off, no distinction between buffers and strict requirements) and procyclical behaviour

- Banks take their target seriously, adjusting their balance-sheet, mainly through outstanding CET1 and portfolio rebalancing

- The distance to target strongly affects credit supply during crisis

- Important lessons for policymakers:
  - Monitoring targets to anticipate movements in credit supply
  - Banks do not consider regulatory buffers usable
  - Need for credible countercyclical buffers to offset banks’ procyclical behaviour


Literature II


Detailed stack of capital demand in the euro area

- Management buffer
  - P2G (bank specific)
  - G-SII

MDA restriction trigger
- SyRB
- O-SII
- CCyB (0% - 2.5%)
- CCoB (2.5%)

Minimum requirement
- P2R (bank specific)
- Minimum requirement (8%)
  - CET1 4.5%
  - AT1 1.5%
  - T2 2%

Excess capital fully usable at the discretion of the bank
Use of this capital trigger “soft” supervisory actions
Combined Buffer Requirement (CET1 only)
(usable capital but with restrictions e.g. to dividends distributions)
Pillar II requirement is bank specific and results from Supervisory Review and Evaluation Process (SREP)
Minimum own funds requirements (Pillar I)
Banks that cannot meet the minimum requirement are unviable
### Results: target determinants - whole results

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCR strict ann.</td>
<td>0.288*** (0.083)</td>
</tr>
<tr>
<td>TSCR strict ann.</td>
<td>0.037 (0.148)</td>
</tr>
<tr>
<td>CBR ann.</td>
<td>0.745*** (0.135)</td>
</tr>
<tr>
<td>AT1 and T2 shortfall</td>
<td>0.032 (0.121)</td>
</tr>
<tr>
<td>P2G</td>
<td>0.037 (0.148)</td>
</tr>
<tr>
<td>CBR ann.</td>
<td>0.745*** (0.135)</td>
</tr>
<tr>
<td>Total Assets, log</td>
<td>0.031 (0.019)</td>
</tr>
<tr>
<td>Return on Asset</td>
<td>0.013 (0.018)</td>
</tr>
<tr>
<td>Off Balance-sheet</td>
<td>0.013 (0.018)</td>
</tr>
<tr>
<td>Diversification</td>
<td>0.005 (0.006)</td>
</tr>
<tr>
<td>Credit ratio</td>
<td>0.011 (0.018)</td>
</tr>
<tr>
<td>RW</td>
<td>0.025 (0.018)</td>
</tr>
<tr>
<td>Impairment ratio</td>
<td>0.012*** (0.046)</td>
</tr>
<tr>
<td>Provisions</td>
<td>0.069*** (0.048)</td>
</tr>
<tr>
<td>Deposit ratio</td>
<td>0.013 (0.009)</td>
</tr>
<tr>
<td>Cost of deposits</td>
<td>0.131 (1.268)</td>
</tr>
<tr>
<td>TLTO</td>
<td>0.018 (0.022)</td>
</tr>
<tr>
<td>GDP growth for. Sj. dom.</td>
<td>-0.584*** (0.255)</td>
</tr>
<tr>
<td>GDP growth for. Sj. EA</td>
<td>-0.769** (0.309)</td>
</tr>
<tr>
<td>EURIBOR</td>
<td>-0.017*** (0.006)</td>
</tr>
<tr>
<td>10-year sov. yield</td>
<td>0.282* (0.166)</td>
</tr>
</tbody>
</table>

**Notes:**
- ***p < 0.01
- **p < 0.05
- *p < 0.1

**References:**
- Cyril Couaillier: What are banks’ actual capital targets?
- Columbia SIPA/BPI conference on Bank Regulation 01 March 2023