L-4: THE BASEL III COUNTERCYCLICAL CAPITAL BUFFER

BOE/JVI COURSE ON MACROPRUDENTIAL TOOLS

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Disclaimer: Opinions expressed do not necessarily reflect the official viewpoint of the JVI.
LECTURE OVERVIEW

1. How does the CCyB work?

2. CCyB calibration based on credit-to-GDP gaps and/or composite indicators

3. Positive neutral CCyB framework

Applied in afternoon workshop
Basic structure of the economic and financial system
Capital regulation for banks

\[ \Sigma \text{Risk-weighted assets} \rightarrow \text{Minimum capital requirement: } \text{Capital} > x\% \text{ of } \Sigma \text{risk-weighted assets} \]

Note: Simplified illustration. Minimum capital requirements are differentiated by capital quality (e.g. common equity tier 1 capital, total capital) and cover all main risk types.
Capital regulation under Basel III

1) Minimum capital requirement
   - Pillar 1 requirement
   - Pillar 2 requirement

2) Capital buffer requirement
   - Capital conservation buffer [CCoB]
   - Countercyclical capital buffer [CCyB]
   - Other capital buffers (e.g. institution- or sector-specific)

3) Management buffer

Backstop: Leverage ratio (% of total exposure).
Note: Simplified illustration.
CCyB in a nutshell

• Time-varying macroprudential instrument under Basel III
  • Response to G-20 call in 2008/09 to mitigate procyclicality in the financial system
  • Guidance for authorities: BCBS 2010

• Build in good times, draw down in bad times
  • Build-up: Envisaged through organic capital generation (retained earnings). Typically, banks are given 12 months lead time.
  • Release: To support loss absorption and maintain flow of bank credit to the economy. Immediate effect after release decision.
  • Full or partial breach by individual bank: Restrictions on distributions.

• Should be set between 0% and 2.5%
  • in exceptional circumstances even above 2.5%

• Based on location of exposure
  • e.g. exposure to borrowers located in France
  • Mandatory international reciprocity until 2.5%
CCyB vs. other capital buffer requirements

Management buffer

CCyB

(0% - 2.5%*)

CCoB

(2.5%)

Minimum capital requirement

Additional buffer requirements:

Institution-specific
(e.g. systemic banks)
[e.g. G-SIB, D-SIB]

Sector-specific
(e.g. mortgage loans)
[e.g. sectoral SyRB]

• CCyB is the only releasable buffer under the Basel III regime
• In stress situations, all capital buffers should be used (i.e. drawn down) as needed
CCyB objectives

• Strengthen banking sector **resilience** to shock events
  • Resilience: ability to bounce back in case of shock (*the reed*)
    ≠ Robustness: ability to withstand shock (*the oak*)
    (de la Fontaine 1668, *Le chêne et le roseau*)

• Tame the credit cycle?
  • **Credit cycle**: (i) longer and (ii) higher amplitude than business cycle, see US example (*Drehman et al. 2012*):

    | ST GDP cycle | Financial cycle | NBER recessions | Peak financial cycle | Trough financial cycle |
    |---------------|-----------------|-----------------|--------------------|----------------------|
    |               |                 |                 |                    |                      |

  • Potential side benefit: ↑ cost of credit and ↓ credit demand in times of excessive credit growth, ↓ amplitude of credit cycle?
2. COUNTERCYCLICAL CAPITAL BUFFER CALIBRATION BASED ON CREDIT-TO-GDP GAPS AND/OR COMPOSITE INDICATORS
Credit-to-GDP gaps

- Common reference guide (BCBS 2010) based on private sector credit-to-GDP gap

- Ideally based on total credit aggregate (incl. bank credit, domestic non-bank credit, cross-border credit)

- Credit-to-GDP ratio: at least 20 years of quarterly data

- Long-term trend based on Hodrick-Prescott (HP) filter with high smoothing parameter ($\lambda=400,000$)

- Credit-to-GDP gap between observed value and trend
  - Best early warning indicator of crises in advanced economies identified in Drehman et al. 2010 and Drehman et al. 2011.
  - Positive gap indicates excessive credit growth: Credit grows faster than GDP with increasing difference in growth rates
  - New debt does not sufficiently contribute to GDP growth but is used to fund either excessive consumption (via imports) or asset transfers (e.g. passing on existing housing stock)

Note: Chart based on dummy data.
CCyB based on credit-to-GDP gaps

- Buffer is set as a function of the credit-to-GDP gap

\[
CCyB = \begin{cases} 
0 & \text{GAP} = \begin{cases} 
< 2 \\
\geq 10 
\end{cases} \\
0.3125 \times GAP - 0.625 & \text{otherwise} 
\end{cases}
\]
Hodrick-Prescott Filter: Finding the trend $y_t^*$

$$\min \left[ \sum_{t=0}^{T} (y_t - y_t^*)^2 + \lambda \sum_{t=2}^{T-1} \left( (y_{t+1}^* - y_t^*)^2 - (y_t^* - y_{t-1}^*)^2 \right) \right]$$

where

$y^*$ = (ln) trend series

$y$ = (ln) actual series

$\lambda$ determines the degree of smoothness of the trend

Note: The series needs to be in logarithms (ln) if it behaves exponentially (e.g. growth of GDP, credit, prices). If the series is a ratio (e.g. credit-to-GDP ratio), it behaves linearly, i.e. no need to use logarithms.
Stylized credit cycle: Credit-to-GDP gaps

Credit-to-GDP gap can signal well the build-up of risks

Note: Simplified illustration.
Stylized credit cycle: Credit-to-GDP gaps

Credit-to-GDP gap does not signal well the release of the buffer
Other indicators used: e.g. CDS spreads, credit growth

Note: Simplified illustration.
Shortcomings of credit-to-GDP gaps

1. Biased estimate of the gap if **too short time series**
   - BCBS recommends 20 years of quarterly data
   - Many emerging markets have less due to various structural breaks
   - Strong catching up can get incorporated into the trend

Possible solutions: use additional early-warning indicators
   - e.g. simple credit-based variables (changes in credit to GDP, credit growth), real estate prices and their ratios to income and rents, credit conditions, various spreads, leverage in the household, corporate and banking sectors, etc.
   - For other suitable indicators, see e.g. ESRB 2014
   - (BCBS, p. 4) **Authorities should look for evidence as to whether the inferences from the credit/GDP gap are consistent with those of other variables.**
Shortcomings of credit-to-GDP gaps

2. **End-point bias**
   - Difference between one-sided and two-sided trend (once new data come in, the estimation of the gap changes)
   - In upturn phases of the credit cycle, the estimation of the trend errs on the wrong / more optimistic side
   - Despite this bias, the one-sided-based gap still performed best as an early warning indicator

Possible solutions:
- Forecasting the series for several future quarters (e.g. approach adopted by the Central Bank of Norway, see Gerdrup et al. 2013) - but not that helpful if the forecast just prolongs the (ever-increasing) trend
- Use additional indicators
Shortcomings of credit-to-GDP gaps

3. No threshold on debt stock
   • If credit grows faster than GDP, but it is not accelerating, credit-to-GDP can rise infinitely without signaling any excessiveness
   • (BCBS, p. 4) *Authorities should form their own judgment about the sustainable level of credit in the economy.*

Possible solutions:
   • Complement the assessment with the use of fundamental-based trend credit (or, alternatively called equilibrium/sustainable credit)
   • Examples of estimations: Gersl and Seidler 2011 and citations therein; IMF 2015a, IMF 2015b; Buncic and Melecky 2013
Shortcomings of the Basel guidance

4. Other issues related to measurement of credit stock especially in EMs
   - **FX loans** - make the stock expressed in domestic currency volatile when the exchange rate is floating, with increase in stock in bad times (depreciation of domestic currency),
   - Strong role for **cross-border and non-bank credit** (often as an evasion strategy by banks to prudential policies)

Possible solutions:
   - Alternative calculations of the credit-to-GDP gap using a credit series adjusted for FX rate changes
   - Using total credit to private sector rather than bank credit to private sector as the credit aggregate (recommended by the BCBS)

Source: Huettl 2015.
Focus on credit-to-GDP gap can lead to lack of buffers

- The Basel guidance (BCBS 2010) refers to activating and increasing the CCyB in response to “excessive credit growth” as measured by the credit-to-GDP gap.
- But: this gap can stay negative for extended period of time, leading to a lack of buffer.
- Calibrating the CCyB rate should not be a mechanical exercise, i.e. no simple link between an indicator and the buffer rate, despite the original Basel III intention. But rather base assessment on set of indicators, tools and expert judgement.
CCyB based on composite indicators

Example 1: Slovak Republic

<table>
<thead>
<tr>
<th>Core variable</th>
<th>Supplementary variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cycles</td>
<td>Unemployment rate</td>
</tr>
<tr>
<td>GDP gap</td>
<td>Property markets</td>
</tr>
<tr>
<td>Banks</td>
<td>Default rates – enterprises</td>
</tr>
<tr>
<td>Credit growth</td>
<td>Loan-to-value ratios</td>
</tr>
<tr>
<td>NPL dynamics</td>
<td>Lending conditions</td>
</tr>
<tr>
<td>Customers</td>
<td>Housing affordability index</td>
</tr>
<tr>
<td>Debt burden – households</td>
<td>Consumer confidence</td>
</tr>
<tr>
<td>Debt burden – enterprises</td>
<td></td>
</tr>
</tbody>
</table>

- Indicators compared to distribution over past years and expressed as percentiles 1-9 (9 = highest / most risky percentile of own distribution)
- Cyclogram = average

CCyB based on composite indicators

Example 2: Lang et al. 2019

- Domestic cyclical systemic risk indicator (d-SRI) for individual euro area countries
- Constructed as optimal weighted average of six early warning indicators (normalized)
  - 36% bank credit-to-GDP change
  - 20% current account balance
  - 17% residential real estate price-to-income ratio change
  - 17% real equity price growth
  - 5% debt service ratio change
  - 5% real total credit growth

Source: Lang et al. 2019.
CCyB based on composite indicators

Example 3: Croatia

Credit-to-GDP gap

Composite indicator of cyclical systemic risks

Source: Hrvatska Narodna Banka.

Notes: Left panel: Blue curve indicates Basel gap. Red and black areas denote range of 12 credit gap indicators selected for better signaling properties than Basel gap. Right panel: ICSR indicates composite indicator of cyclical systemic risks. Colored areas denote components.
3. POSITIVE NEUTRAL COUNTERCYCLICAL CAPITAL BUFFER FRAMEWORK
Positive neutral CCyB

Example: United Kingdom / Bank of England

Positive neutral CCyB framework introduced by Bank of England in 2016, currently set at 2%

Announced CCyB rates:
- March 2016: 0.5%
- June 2016: 0% [Brexit referendum]
- June 2017: 0.5%
- Nov. 2017: 1%
- Dec. 2019: 2%
- March 2020: 0% [Covid-19 pandemic]
- Dec. 2021: 1%
- July 2022: 2%

Positive neutral CCyB in a nutshell

**Management buffer**

**Minimum capital requirement**

**Positive neutral CCyB rate**

**CCyB**

**CCoB**

**Additional buffer requirements:**

| Institution-specific (e.g. systemic banks) [e.g. G-SIB, D-SIB] |
| Sector-specific (e.g. mortgage loans) [e.g. sectoral SyRB] |
Positive neutral CCyB: How to operate it?

• **Green**: Build-up starts when the supply of credit is not constrained by capital requirements.
• **Orange**: Early warning indicators, incl. credit gaps, can signal increases beyond the neutral level.
• **Red**: Financial stress indicators signal release.

Source: Miettinen and Nier (forthcoming).
Positive neutral CCyB: Which level?

- Different calibration approaches used in countries with positive neutral CCyB level in “standard risk environment”:
  - Historical losses
  - Stress test models
  - Impact of previous buffer releases (e.g. during Covid-19 pandemic)
  - Range of the above and/or other indicators and/or expert judgement

- Additional considerations for deciding on the positive neutral CCyB level:
  - What is the available management buffer? How quickly can banks raise capital?
  - How confident are we with ability to spot risks in a timely manner? (If low, ↑ pos. neutral CCyB)

- Country examples with positive neutral CCyB as of early 2023:
  - 2%: Netherlands, Sweden, United Kingdom
  - 1.5%: Armenia, Ireland
  - 1%: Australia, Czech Republic, Estonia, Georgia, Lithuania
  - 0.5%: Cyprus

Recent CCyB trends in Europe

- Macroprudential policy tightening in many countries of the Central, Eastern and Southeastern Europe (CESEE) and Caucasus region in 2021-23
  - in particular via CCyB activation or increases
  - often in parallel to MP tightening, which already started in 2021 in some CESEE countries, and in absence of financial stress:
    - Country examples (with latest announced CCyB rates in brackets): Bulgaria (2%), Croatia (1%), Czech Republic (2.5%), Estonia (1.5%), Georgia (1%), Hungary (0.5%), Lithuania (1%), Slovakia (1.5%), Slovenia (0.5%)
- In parallel, macroprudential tightening cycle in some large European economies, in addition to selected other countries (e.g. Cyprus, Ireland)
  - e.g. CCyB in Germany (to 0.75%), France (1%), Sweden (2%), United Kingdom (2%)
Conclusions

• CCyB as only releasable capital buffer under Basel III - very useful to have, yet requires an enabling legal and policy framework
  • Who takes decisions, how often, on which legal basis, etc.
• Perform regular cyclical systemic risks analysis for your country to inform the CCyB calibration
  • Credit-to-GDP gap methodology as common starting (rather than end) point
  • Complement credit-to-GDP gap analysis with additional indicators
  • Consider developing a composite indicator for cyclical systemic risk based on country-specific data availability and risk characteristics to support CCyB setting
  • Monitor international developments in CCyB setting and explore merits of a positive neutral CCyB framework, possibly leveraging on peer learning
• Act on increasing the CCyB when it is time to act. More difficult than release decisions.
References


References


• Huettl, P., 2015, Foreign loan hangovers and macro-prudential measures in Central Eastern Europe, Bruegel blog post, 14 October 2015.
References

• IMF, 2015a, Regional Economic Issues, May 2015
• IMF, 2015b, The Western Balkans. 15 Years of Economic Transition.
• Miettinen, P. and Nier, E., forthcoming, Towards Positive Neutral Countercyclical Capital Buffer Rates—a Policy Note, IMF.
Thank you for your attention!

Questions / Comments / Feedback?

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