Macroprudential Policy Leakage through Firms

Internal Capital Markets of Multinational Corporations Observed in Action

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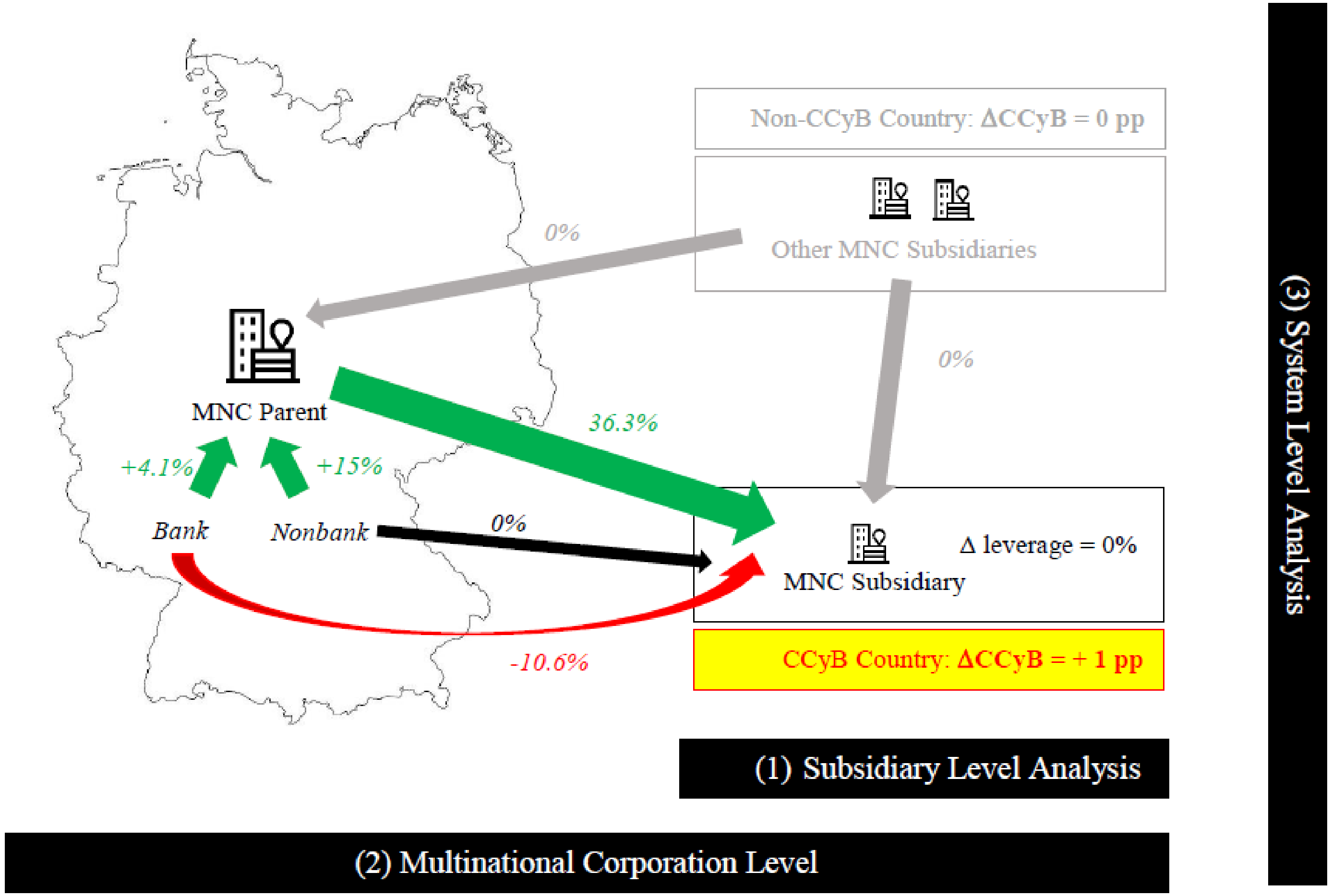
These are the views of the authors and not necessarily those of the Deutsche Bundesbank or the European Central bank.

How do multinational corporations (MNCs) react to bank credit shocks abroad?

- Analysis of
  - MNCs with parent companies in Germany and subsidiaries abroad, and
  - credit supply shocks abroad.

- Analyses on 3 different levels:
  (1) Subsidiary level
  (2) MNC level
  (3) System level



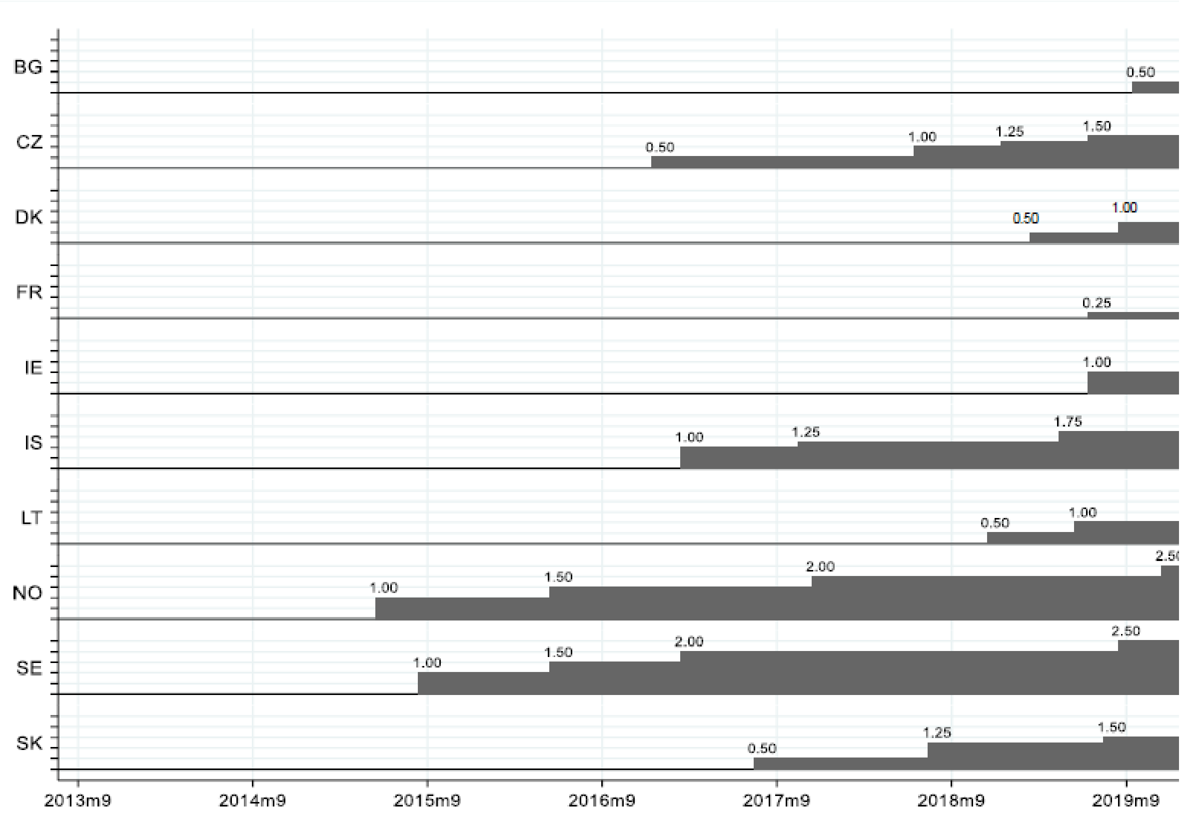
We use a unique combination of proprietary datasets

- **Credit registry data on lender-firm lending relationships:**
  - banks and non-banks as lenders
  - domestic and cross-border lending
  - no prices, but borrower PDs
  - quarterly frequency
  - [Mio - Millionenkreditevidenz]
- **Data on MNCs**
  - parent companies in DE and affiliated firms abroad (subsidiaries)
  - ownership structures
  - balance sheet items incl. liability structure
  - annual frequency
  - [MiDi – Mikrodatenset Direktinvestitionen]

- as well as other freely available data on macropru measures.

As shocks we use the frequent increases in the CCyB rates

- CCyB: Counter-cyclical capital buffer
- Objective: increase banks' resilience.
- CCyB was activated and increased in 10 out of our 29 sample countries.
    - EU27 & IS & NO
- No CCyB decreases during sample period.
- Reciprocation is mandatory for CCyB! This is to avoid circumvention.
- Implementation date is considered.



Literature

Our work relates to different strands in the literature

- On the levering of MNCs' internal capital markets in order to circumvent unfavorable financing conditions in a jurisdiction.
- On the transmission of financial shocks through MNCs' internal capital markets.
- On the implication of changes in bank capital regulation and the implications for broader financial stability.

Contribution

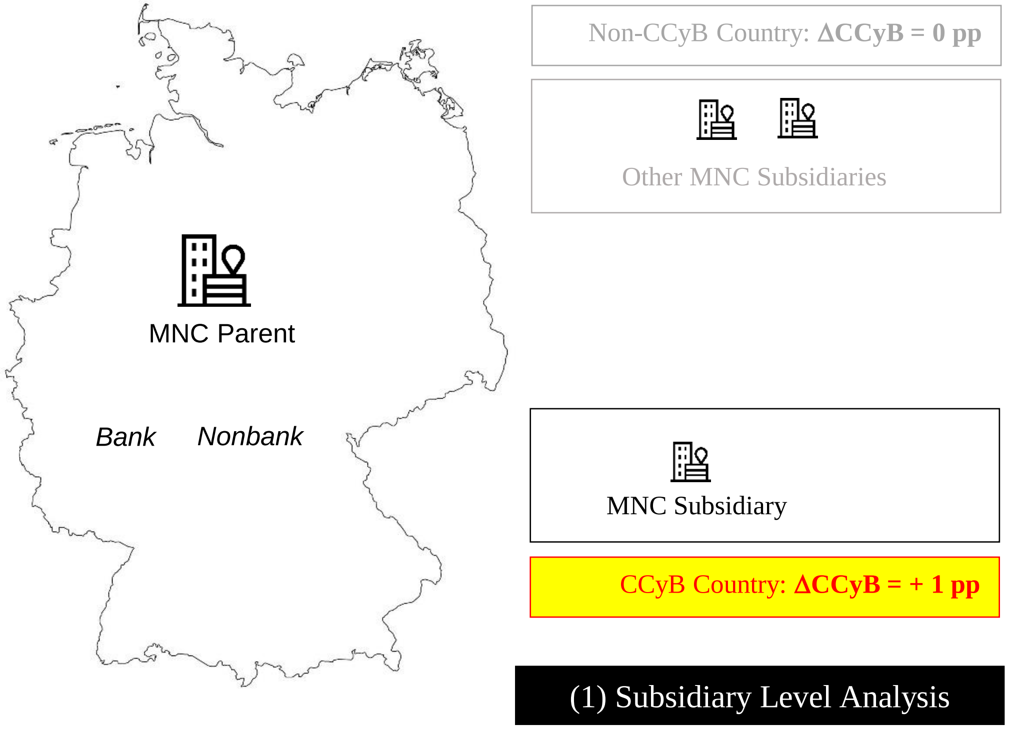
- MNCs' reaction to many exogenous shocks to subsidiaries.
- Interrelations of bank and nonbank lending dynamics.
- Interrelations between external borrowing of MNCs and ensuing internal financing dynamics.

(1) Subsidiary level analysis

- What is the impact of the CCyB on lending to MNC subsidiaries located in countries with activated CCyB?
  - intensive margin
  - extensive margin
- Is a shift from bank to non-bank lending observable?

$$Y_{l,f,t} = \beta * CCyB_{c_f,t} + I_f + I_{i,t} + I_{l,t} + \varepsilon_{l,f,t}$$

- Y is the log(credit) from lender l to firm f in time t
- $I_{i,t}$ are firm-industry fixed effects



(1) Subsidiary level analysis

A 1pp higher CCyB rate is associated with:

- About 11% less bank lending (upper table).
- Bank-firm relationships are more likely to end (lower table).
- No impact on nonbank lending to affected subsidiaries (not shown).

Panel A. All subsidiaries

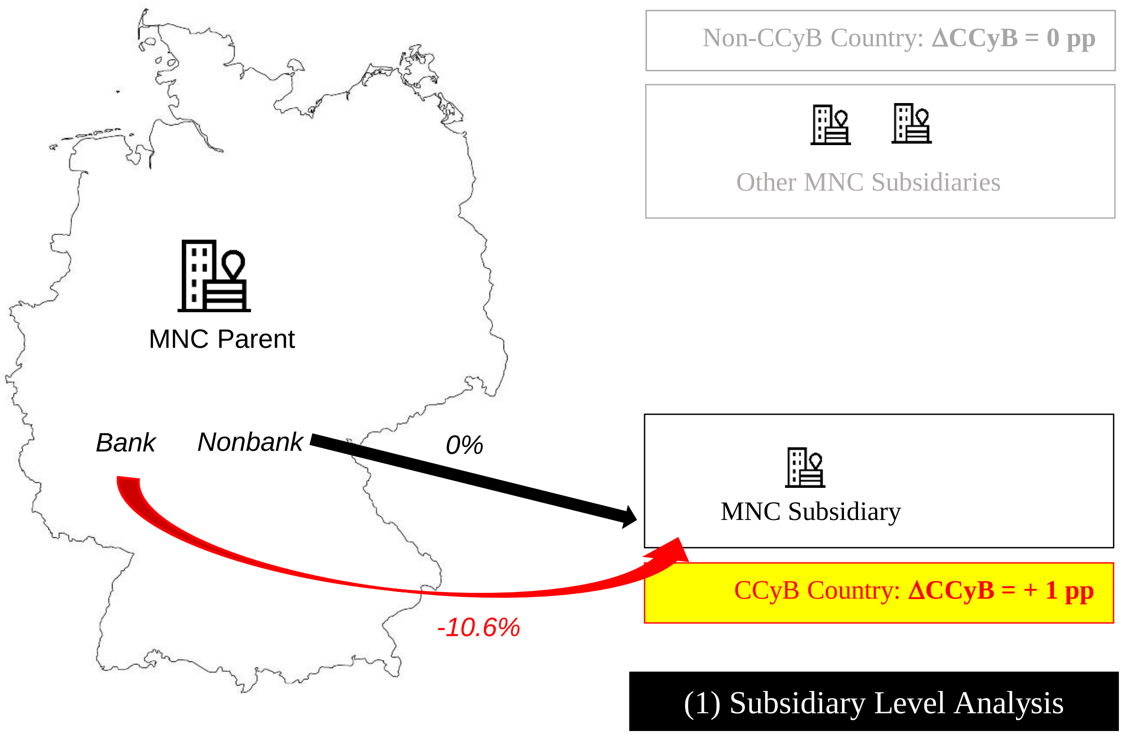
	(1)	(2)	(3)	(4)	(5)
CCyB rate (%)	-0.492**	-0.168***	-0.110**	-0.092**	-0.106**
	(-2.517)	(-3.722)	(-2.185)	(-2.185)	(-2.318)
FIXED EFFECTS					
Year:quarter	Yes	Yes	Yes	Yes	Yes
Firm	No	Yes	Yes	Yes	Yes
Industry x Year:quarter	No	No	Yes	Yes	Yes
Lender	No	No	No	Yes	Yes
Lender x Year:quarter	No	No	No	No	Yes
Observations	32,073	32,073	32,073	32,073	32,073
Adj. R-squared	0.015	0.766	0.769	0.826	0.820

Panel C. Extensive Margin

	Bank-Firm Relationship End			Bank-Firm Relationship Start		
	(1)	(2)	(3)	(4)	(5)	(6)
CCyB rate (%)	0.090***	0.026**	0.018***	-0.007	0.000	-0.003
	(10.069)	(2.665)	(2.814)	(-1.213)	(0.020)	(-0.853)
FIXED EFFECTS						
Year:quarter	Yes	Yes	Yes	Yes	Yes	Yes
Firm	No	Yes	Yes	No	Yes	Yes
Industry x Year:quarter	No	No	Yes	No	No	Yes
Observations	177,367	177,367	177,367	177,367	177,367	177,367
Adj. R-squared	0.044	0.082	0.139	-0.008	0.010	0.045

(1) Subsidiary level analysis

- Increase in CCyB rate leads to credit supply shock for borrowing firms in regulating jurisdictions.
- This is a consequence of the mandatory reciprocity.
- No increase in non-bank lending observable.
- Caveat: only lending from DE observable.



(2) MNC level analysis

- Do MNCs circumvent unfavorable financing conditions in one country by levering their internal capital markets?
- Does the credit supply shock lead to increased internal funding for affected subsidiaries?

- <u>Direct:</u> borrowing (and implications) for subsidiaries
  - Debt of a subsidiary towards the parent
  - Overall indebtedness of the subsidiary

- <u>Indirect:</u> refinancing of parent

(2) MNC level analysis

A 1pp higher CCyB rate is associated with:

- A significant increase of subs' internal debt towards the parent (upper table).
- No significant effect on affected subs' liabilities (lower table).
- No significant change in subs' debt towards other subs of the same MNC (not shown).
- No significant effect on subs' PDs (not shown).

Panel A. All subsidiaries

	log(internal debt from parent)		internal debt from parent / total assets (%)		internal debt from parent / total liabilities (%)	
	(1)	(2)	(3)	(4)	(5)	(6)
CCyB rate (%)	0.258***	0.363***	0.827*	1.237**	1.769**	2.284***
	(3.013)	(4.226)	(1.872)	(2.746)	(2.193)	(3.790)
FIXED EFFECTS						
Year:quarter	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year:quarter	No	Yes	No	Yes	No	Yes
Observations	25,887	25,887	25,887	25,887	25,887	25,887
Adj. R-squared	0.808	0.811	0.805	0.809	0.739	0.743

Panel A. Total Liabilities of Subsidiaries

	All subsidiaries		Subsidiaries, excl. unaff. subs. with other affected subs. in the MNC	
	log(liabilities)	liabilities/ total assets	log(liabilities)	liabilities/ total assets
	(1)	(2)	(3)	(4)
CCyB rate (%)	-0.018	0.452	-0.027	0.274
	(-0.422)	(0.352)	(-0.645)	(0.210)
FIXED EFFECTS				
Year:quarter	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes
Industry x Year:quarter	Yes	Yes	Yes	Yes
Observations	41,689	41,689	36,853	36,853
Adj. R-squared	0.927	0.913	0.927	0.913

(2) MNC level analysis

Parents of subs affected by an increase in the CCyB:

- Increase their borrowing from banks and from nonbanks (upper table).
  - 4% more from banks
  - 15% more from non-banks
- Consequently, face an increase in their PDs (not shown).
- PDs increase on average by 10bps which is about 25% of the previous value.
- No increase in parents' liabilities to other unaffected subs (not shown).

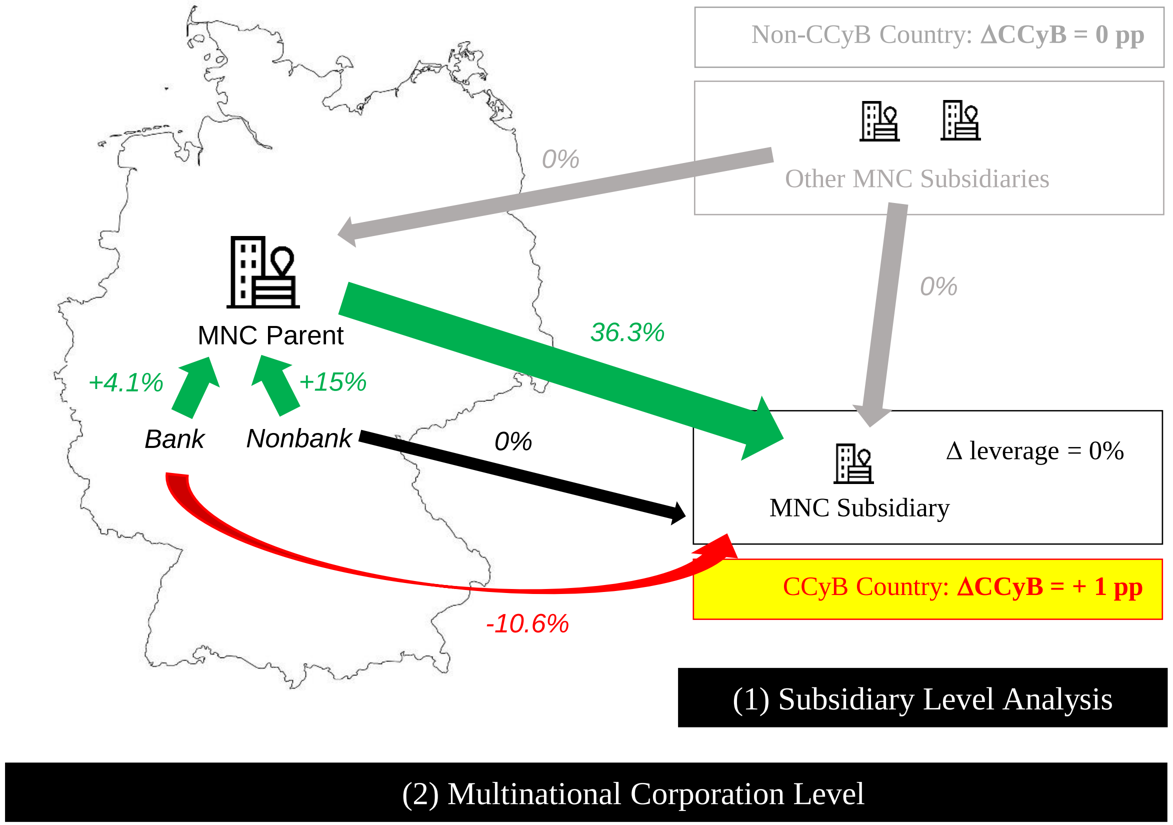
Panel A. Refinancing of the Parent

	Bank lending		Nonbank lending	
	(1)	(2)	(3)	(4)
Parent with affected subsidiary	0.031**	0.041**	0.130***	0.150***
	(2.072)	(2.770)	(3.211)	(3.231)
FIXED EFFECTS				
Year:quarter	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes
Industry x Year:quarter	Yes	Yes	Yes	Yes
Lender	Yes	Yes	Yes	Yes
Lender x Year:quarter	No	Yes	No	Yes
Observations	123,893	123,893	28,556	28,556
Adj. R-squared	0.481	0.430	0.651	0.617

(2) MNC level analysis

Parents of subs affected by an increase in the CCyB:

- Increase their internal lending to affected subs.
- Fully substitute for the subs' credit supply shock.
- Parent refinance via borrowing from banks and from nonbanks.
- They do not draw funds from other unaffected subs.



Summary and conclusions

- MNC internal capital markets help to overcome financing frictions of subs.
- Regulatory tightening does not necessarily cause borrowers turning towards non-bank lending.
- Internal and external financing of MNCs depends on the riskiness of the parent company.
- Regulatory change can cause adverse international spillovers.
- Overall effect depends on point of view taken.