The *Great Lockdown*: pandemic response policies and bank lending conditions

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Helicopter view

Three main questions:

1. Did the **policy response** to the pandemic affect **banks’ intermediation capacity**?
2. Did the **coordinated nature of the pandemic policy response** trigger an **amplification effect**?
3. Did policy measures influence the **real economy**?

Results:

- In the absence of **liquidity provision measures**, lending would have been significantly lower
- **Capital relief measures** supported banks’ intermediation capacity
- **Policy coordination** produced an **amplification** effect
- The policy responses avoided a more severe contraction in **firms’ employment**
Outline

- Monetary policy response to the pandemic
  - The impact on bank lending conditions
  - Complementarity of policies

- Real effects of pandemic measures
  - Impact on firm viability
  - Effect on firm employment and productivity

- Conclusions
Monetary policy response

Borrowing from the Eurosystem
(EUR billion)

Monetary Policy announcements in 2020

- March 12th: APP +120bn, TLTRO recalibration, bridge LTROs
- March 15th: USD swap lines
- March 18th: PEPP 750bn
- April 7th: Collateral easing
- April 30th: TLTRO recalibration, PELTRO
- June 4th: PEPP +600bn
- December 10th: TLTRO recalibration, PEPP +500bn
Data

- Proprietary ECB data on Individual Balance Sheet Items (iBSI)
  - Number of banks: 360 unconsolidated banks
  - Frequency: monthly between September 2014 and December 2020
  - Representativeness: 75-80% of the total outstanding loan amounts in the euro area

- Confidential ECB data on bank-level liquidity operations
  - Amount borrowed under each operation
  - Maximum borrowing amount (borrowing allowance)

- High-frequency market data
  - Individual banks’ bond yields at daily frequency
  - Individual banks’ stock prices at intra-day frequency

- Confidential supervisory data
  - Bank-level capital ratios (CET1)
  - Individual bank capital requirement from SREP (Supervisory Review and Evaluation Process)
Monetary policy: model

\[ \Delta L_{i,t+h}^\tau = \alpha_{c,t,h}^\tau + \alpha_{i,h}^\tau + \beta_h^{\tau} TLTRO_{i,t}^\tau + \Gamma_h X_{i,t-1}^\tau + \varepsilon_{i,t+h}^\tau \]

\[ h = 1, \ldots, H \]

\[ \tau = \{ \text{Pre–pandemic} \} \text{ until February 2020} \]

\[ \tau = \{ \text{Post–pandemic} \} \text{ from March 2020} \]

\( \Delta L_{i,t+h}^\tau \) change in volume of loans to NFCs of bank \( i \) between \( t-1 \) and \( t+h-1 \)

\( TLTRO_{i,t}^\tau \) ✓ bank bond reaction around policy announcements: \( TLTROshock_{i,t}^\tau \)

\( X \) change in ratio of uptake over borrowing allowance: \( TLTROuptake_{i,t}^\tau \)

\( \alpha_{c,t,h}^\tau \) country-time fixed effects specific to the horizon \( h \)

\( \alpha_{i,h}^\tau \) bank fixed effects specific to the horizon \( h \)

\( X_{i,t-1}^\tau \) additional explanatory variables (including other policies and bank specific demand)

Cluster at bank level, robust at country-time level;
Monetary policy shock: bank bond reaction to the policy announcement

TLTRO shock vs TLTRO uptake (utilization ratio)

Each dot represents a change in TLTRO shock and TLTRO uptake for a given bank in each month, over the period September 2014 December 2020 (around 7000 observations).

The table reports the list of events used to identify the impact of TLTRO announcements on bank bond yields.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event type</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>08-May-14</td>
<td>Governing Council meeting</td>
<td>Draghi ready to act at next meeting</td>
</tr>
<tr>
<td>05-Jun-14</td>
<td>Governing Council meeting</td>
<td>TLTRO-I announcement</td>
</tr>
<tr>
<td>03-Jul-14</td>
<td>Governing Council meeting</td>
<td>TLTRO-I technical details</td>
</tr>
<tr>
<td>29-Jul-14</td>
<td>Press Release</td>
<td>TLTRO-I legal acts publication</td>
</tr>
<tr>
<td>22-Jan-15</td>
<td>Governing Council meeting</td>
<td>TLTRO-I modified interest rate</td>
</tr>
<tr>
<td>10-Mar-16</td>
<td>Governing Council meeting</td>
<td>TLTRO-II announcement</td>
</tr>
<tr>
<td>03-May-16</td>
<td>Press Release</td>
<td>TLTRO-II legal acts publication</td>
</tr>
<tr>
<td>07-Mar-19</td>
<td>Governing Council meeting</td>
<td>TLTRO-III announcement</td>
</tr>
<tr>
<td>06-Jun-19</td>
<td>Governing Council meeting</td>
<td>TLTRO-III technical details</td>
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<tr>
<td>29-Jul-19</td>
<td>Press Release</td>
<td>TLTRO-III legal acts publication</td>
</tr>
<tr>
<td>12-Sep-19</td>
<td>Governing Council meeting</td>
<td>TLTRO-III modified interest rate</td>
</tr>
<tr>
<td>12-Mar-20</td>
<td>Governing Council meeting</td>
<td>TLTRO-III easing conditions</td>
</tr>
<tr>
<td>30-Apr-20</td>
<td>Governing Council meeting</td>
<td>TLTRO-III pandemic rate reduction</td>
</tr>
<tr>
<td>10-Dec-20</td>
<td>Governing Council meeting</td>
<td>TLTRO-III prolonged easing conditions</td>
</tr>
</tbody>
</table>
Monetary policy shock: bank bond reaction to the policy announcement

Intra-daily stock returns and daily changes in bond yields on announcement day (April 2020)

Lending before and after announcement by policy exposure

Change in bond yields (p.p.)

Stock returns during announcement (p.p.)

Loan volumes, March 2020 = 100

High TLTRO shock

Low TLTRO shock

Mar 2020

Jun 2020
The effects of monetary policy on loan growth

- Use high-frequency reaction of bank bond yields around TLTRO-related announcements as regressor: $T_{LTRO}^{\text{shock}}_{i,t}$
- Gradual transmission, reflecting delayed response of loan origination
- Larger impact in the post-pandemic period
Monetary policy: placing our result within the range of estimates of previous studies

Distribution of the impact of TLTROs on loan growth

Result robust to:

- Concomitant policy measures
  - guarantee schemes
  - purchase programmes
  - negative rate policy

- Bank specific characteristics
  - funding structure
  - business model
Outline

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Policy response: *macroprudential and supervisory measures*

**CET1 capital and capital relief measures**
(2019Q4 EUR bn)

- **Management buffer**
- **Buffer requirements and guidance**
- **Minimum requirements**

- **Over €140bn freed by macro- and microprudential authorities**
- **+1.5 pp of capital buffer**

**Macro- & Micro-prudential adjustments in 2020**

- **March 11th**: Macro-prudential measures by national authorities (CCyB, SyRB, O-SII)
- **March 12th**: Micro-prudential capital and operational relief (P2R, P2G)
- **March 20th**: Additional micro-prudential flexibility (NPL, IFRS9)
- **March 27th**: ECB recommendation on dividends’ distribution restriction (October 2020)
- **May 27th**: ESRB recommendation on dividends’ distribution restriction (January 2021)
Policy complementarities: *interaction of TLTROs with capital availability*

\[ \Delta L_{i,t} = \alpha_{c,t} + \alpha_i + \beta TLTRO_{i,t} + \delta \text{CapitalBuffer}_{i,t} + \gamma TLTRO_{i,t} \times \text{CapitalBuffer}_{i,t} + \Gamma X_{i,t-1} + \varepsilon_{i,t} \]

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(1) Post-pandemic Loan growth</th>
<th>(2) Post-pandemic Loan growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLTRO shock x Capital buffer</td>
<td>0.020*** (0.007)</td>
<td>0.025*** (0.007)</td>
</tr>
<tr>
<td>TLTRO shock</td>
<td>0.087*** (0.029)</td>
<td>0.096*** (0.033)</td>
</tr>
<tr>
<td>Controls for bank size and capital buffer</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Controls for concomitant measures/funding structure</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Bank FE</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Country-time FE</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>1828</td>
<td>1693</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.343</td>
<td>0.325</td>
</tr>
</tbody>
</table>

- Complementarity between funding relief from TLTROs and risk-bearing capacity **amplifies** loan expansion
- Result robust to the inclusion of controls for concomitant policy measures and bank funding structure
Outline

- **Monetary policy response to the pandemic**
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The real effects of pandemic measures: *data and questions*

- Firm-level data from Bureau Van Dijk’s Orbis
  - Balance sheet information for listed and unlisted companies in the euro area
  - Data transmission for the year 2020: becoming available during April 2022

- Information on the identity of the banks connected to each firm

- Final matched sample:
  - 411K firms between 2019-2020 (capturing post-pandemic developments)
  - 82 banks
  - 716 individual 4-digit NACE industry classification

- **Empirical questions:**
  - Did TLTRO support non-viable firms?
  - Did TLTRO contain the decline in firm employment and productivity?
  - Is there evidence of amplification effects from the coordinated policy intervention?
The real effects of pandemic measures: model

- Firm-level data matched with bank-level data (from Bureau Van Dijk’s Orbis)

\[ y_f = \delta_{\text{TLTROshock}_f} + \gamma_{\text{Capital relief}_f} + \Gamma X_f + \alpha_{i,l,s} + \varepsilon_f \]

- Zombie lending: dummy = 1 if \( f \) is zombie in 2020
- Percentage change in firm \( f \)'s employment between year 2019 and 2020
- Percentage change in firm \( f \)'s productivity between year 2019 and 2020

- \( \text{TLTROshock}_f \): Average bank bond shock experienced by bank connected to firm \( f \)
- \( \text{Capital relief}_f \): Average capital relief experienced by bank connected to firm \( f \)
- \( X_f \): Controls for concomitant policy measures (fiscal and monetary)
- \( \alpha_{i,l,s} \): Industry-location-size fixed effects
- Cluster at main bank level
Did TLTRO III support zombie firms?

\[ \text{Zombie}_f = \delta \text{TLTRO shock}_f + \gamma \text{Capital relief}_f + \Gamma X_f + \alpha_{i,l,s} + \epsilon_f \]

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>end-2020</td>
<td>end-2019</td>
</tr>
<tr>
<td>TLTRO shock</td>
<td>-0.118*</td>
<td>-0.081</td>
</tr>
<tr>
<td></td>
<td>(0.066)</td>
<td>(0.066)</td>
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<tr>
<td>Capital relief</td>
<td>0.005</td>
<td>-0.016</td>
</tr>
<tr>
<td></td>
<td>(0.118)</td>
<td>(0.128)</td>
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<tr>
<td>Control for government guarantees</td>
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<td>YES</td>
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<tr>
<td>Control for sovereign holdings</td>
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<td>YES</td>
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<tr>
<td>Industry-location-size FE</td>
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<td>YES</td>
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<tr>
<td>Observations</td>
<td>394,014</td>
<td>411,012</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.062</td>
<td>0.060</td>
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</tbody>
</table>

- Firms associated with banks more affected by the TLTRO less likely to be classified as zombie in 2020
- Pre-trend test: no significant relationship between the April 2020 TLTRO shock and zombie classification in 2019
Did TLTRO contain the decline in firm employment and productivity?

\[ y_f = \delta TLTRO_{\text{shock}} f + \gamma \text{Capital relief}_f + \Gamma X_f + \alpha_{i,l,s} + \varepsilon_f \]

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
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<tr>
<td><strong>Dependent variable</strong></td>
<td><strong>Employment</strong></td>
<td><strong>Productivity</strong></td>
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<tr>
<td>TLTRO shock</td>
<td>0.012***</td>
<td>0.011*</td>
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<tr>
<td></td>
<td>(0.003)</td>
<td>(0.007)</td>
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<tr>
<td>Capital relief</td>
<td>0.308**</td>
<td>0.437</td>
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<tr>
<td></td>
<td>(0.134)</td>
<td>(0.266)</td>
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<tr>
<td>Control for government guarantees</td>
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<td>YES</td>
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<tr>
<td>Control for sovereign holdings</td>
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<td>Industry-location-size FE</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Observations</td>
<td>411,012</td>
<td>410,737</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.084</td>
<td>0.157</td>
</tr>
</tbody>
</table>

- Firms associated with banks more affected by the TLTRO shock: less likely to have reduced employment and productivity (as on aggregate both employment and productivity drop)
- In the absence of pandemic measures, employment reduction would have been stronger
Amplification effects from coordinated policy intervention?

- Interaction of TLTRO shock and capital buffer amplify impact on:
  - reduction in probability of being zombie in 2020
  - dampening employment reduction between 2019-2020

- No significant impact on productivity from the interaction of measures

![Graphs showing amplification effects]
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Conclusions

- The unprecedented policy response to the COVID-19 crisis, in the form of **new and more targeted measures**, has been crucial for counteracting the adverse economic consequences associated with the outbreak and intensification of the crisis.

- Using **confidential data** since the start of the pandemic, we estimate the impact of the **funding cost relief** from TLTROs.

- Our **results** show that:
  1. The **pandemic response policies** have prevented the materialization of an adverse equilibrium which would have resulted in a substantial contraction in lending.
  2. The close coordination between monetary policy and prudential measures has generated an **amplification effect** on lending.
  3. In the absence of support measures, **firms’ employment** would have declined more.