Follow-thy-neighbor? Spillovers of asset purchases within the real sector

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Motivation
- The economy consists of networks of participants. Firms are dependent on each other and influence each other.
- Unconventional monetary policy (UMP) can induce zombie lending behavior and is oftentimes followed by a sluggish economic recovery (Acharya et al., AER 2019).
- To gain an understanding of the aggregate impact of UMP it is crucial to understand how the shock disseminates among market participants.

The ECB’s first asset purchase programme
- The ECB introduced the Securities Market Programme (SMP) in May 2010.
- The ECB purchased government bonds from five crisis countries.
- It was the first time that the ECB intervened. The programme marked a regime shift and was largely unexpected.
- The aim of the programme was to lower government bond yields, not to stimulate credit growth.
- Still, Koetter (JME, 2020) shows that unconventional monetary policy (UMP) can induce zombie lending.
- Koetter (JME, 2020) shows that the SMP stimulated regional banks’ credit growth.
- However, it is crucial to understand how the shock disseminates among market participants.
- Unconventional monetary policy (UMP) can induce zombie lending.
- Weakly capitalized banks increase lending to high leveraged banks. 
- Banks’ exposure to the SMP provided by Koetter (JME, 2020) is largely expected.
- Koetter (JME, 2020) shows that the SMP stimulated regional banks’ credit growth.
- The economy consists of networks of participants. Firms are dependent on each other and influence each other.
- Unconventional monetary policy (UMP) can induce zombie lending behavior and is oftentimes followed by a sluggish economic recovery (Acharya et al., AER 2019).
- To gain an understanding of the aggregate impact of UMP it is crucial to understand how the shock disseminates among market participants.

Research question: Does unconventional monetary policy which sparks zombie lending induce spillover effects between firms?

Setting: Side-effects of the first asset purchase program of the ECB - the securities market programme (SMP) on German firms and their peers.

Results: Directly exposed firms invest less. There are negative spillover effects on firms operating in the surroundings.

Contribution: Zombie lending diametrically impacts economic growth also via spillovers between firms. The effect is not visible in a common differences-in-differences framework!

Zombie lending
- I replicate findings by Koetter (JME, 2020) that regional banks increase lending to firms.
- Weakly capitalized banks increase lending to high leveraged firms similar to the finding of Acharya et al. (AER, 2019) on the later Outright Monetary Transaction programme.

Hypotheses
Directly affected firms might change their investment behavior. Spillovers could occur due to local aggregate demand effects, agglomeration spillovers, or the use of peers as a source of information.

H1: There are concurrent spillovers to investment behavior of peer firms.
- There can also be competition between firms. Firms receiving cheaper funding might drive peer firms out of the market.

H0: There are diametrical spillovers on investment behavior on peer firms.

Data
- Banks’ exposure to the SMP provided by Koetter (JME, 2020).
- Bureau van Dijk’s Amadeus firm level data and Dafne-Robust broker-links.

Sample:
- German SMEs linked to German regional banks with a single bank relationship which report investments.
- 11,809 firms over time period 2007-2011, or 38,663 firm-year observations.
- 395 NUTS-3 regions, 19 sectors according to NAICS.
- 25.5% of observations are directly treated and the average exposure within the cluster is 28.8%.

On the aggregate ...
- High exposed regions do not show higher GDP growth similar to findings in Acharya et al. (AER, 2019). But they exhibit lower unemployment rates.

Table 1: Aggregate results

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<tr>
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<th>(I)</th>
<th>(II)</th>
<th>(III)</th>
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<tbody>
<tr>
<td>GDP growth</td>
<td>0.003</td>
<td>-0.058**</td>
<td>-0.018***</td>
</tr>
<tr>
<td>SMEs</td>
<td>(0.004)</td>
<td>(0.017)</td>
<td>(0.016)</td>
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</tbody>
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| Post × SMPshare

Table 2: Spillover effects

In this Table 1 show results from estimating equation (1). I further augment the model and differentiate between spillovers on treated (SMP+1) and untreated (SMP=0) by estimating the following regressions on the region level y_t = γ_1 × Post_t × SMPshare_t + γ_2 × SMPshare_t + γ_3 × SMEs_t + γ_4 × Post_t × SMPshare_t × SMEs_t.

Identifying spillovers
I follow Berg et. al (JFE 2021) to measure direct and spillover effects of the SMP on firms’ investment behavior.

Y_t = γ_1 × SMPshare_t × Post_t
+ γ_2 × Post_t × SMPshare_t
+ α_1 + δ_1 × SMSP_1 + ε_t

Further Results
- Treated firms increase employment which is reflected in lower aggregate unemployment.
- Competition increases: profits decrease for and market shares shrink for all firms in high-exposed clusters.

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