Discussion of
Zombie Credit and (Dis-)Inflation: Evidence from Europe
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introduction

Zombies come with stagnation and “low for long” policies

- increased forbearance: Peek-Rosengren (2005), Caballero-Hoshi-Kashyap (2008)


This paper: zombies responsible for lack of inflation in Europe

- via: increased within-industry competition
timely
■ brief review of key concepts

■ comments along the way to make the analysis stronger
  ■ comparing inflation across industries
  ■ descriptive statistics on the industry disaggregation would be helpful
  ■ how to interpret in a standard GE setting

Overall, this is a good paper with lot of details and careful analysis. Highly recommend reading.
A firm is a *zombie* if meets following criteria:

- $\frac{\text{EBIT}}{\text{interest expense}} < \text{median (industry-country)}$
- Leverage ratio $\frac{\text{interest expense}}{\text{total interest bearing debt}} > \text{median (industry-country)}$
- $\frac{\text{interest expense}}{\text{total interest bearing debt}} < \text{AAA firms’ avg interest rate}$

relatively standard in the literature

(yoy) CPI growth at industry-country level

- aggregated to industry from product level (five digit) data
some concerns on Eurostat CPI

some standard concerns

- outlet closing may be a problem in high zombie share × non-tradable industry
- presence of imported products in CPI - might matter for tradable vs non-tradable industries
- outlet bias [Aghion, Bergeaud, Boppart, Klenow, Li (2019, AER)]
- entry and exit of products [Feenstra (1994)]

how to compare across industries?

If variations in zombies change firm dynamics across industries (or within industry across countries):
simple aggregation of prices may miss quality changes
some suggestions

Provide some robustness to how the inflation (PPI + CPI) are combined.

- if not using already, could use Harmonized Index of Consumer Prices from Eurostat

- robustness to use of Laspeyres/Paasche/Fisher

- exact price index to account for product quality changes
  
  rough approximation: use firm-level data to construct market shares at the industry level to adjust for quality ala Feenstra (1994)

Serves two purposes

- quantify the extent of inflation mis-measurement in Euro area combining BvD with Eurostat

- robustness
exact price index under CES-DS structure: illustration

rate of increase in product variety matters for welfare

\[ C_t = \left( \int_0^{N_t} [q_t(j)c_t(j)] \frac{\sigma-1}{\sigma} \, dj \right)^\frac{\sigma}{\sigma-1}; \quad \sigma > 1 \]

$q_t(j)$ is quality of variety $j$ and $N_t$ is # of active varieties. The aggregate price index is given by:

\[ P_t = \left( \int_0^{N_t} \left[ \frac{p_t(j)}{q_t(j)} \right]^{1-\sigma} \, dj \right)^\frac{1}{1-\sigma} \]

Feenstra (1994): true inflation for subset $I_t$ is

\[ \pi_t = \hat{\pi}_t - \frac{1}{\sigma - 1} \log \left( \frac{S_{I,t-1}}{S_{I,t}} \right) \]

increase in market share $S_{I,t}$ implies that relative price must be falling. The bias is larger when $\sigma$ is smaller.

For endogenous markups $\mu(N_t)$, Feenstra and Weinstein (2017, JPE) derive price indices with symmetric translog preferences (see also Diewert (1976), Bergin and Feenstra (2001), Bilbiie Ghironi and Melitz (2008, 2012), Jaravel (2018)).
Q2: which sectors
descriptive stats on share of zombies by industry in the inflation-linked data would be useful

- show what industries remain in the inflation-linked data and their zombie share
- contribution of these industries to aggregate inflation?

to get a sense of aggregate effects

Note: Industries with higher share of zombies show lower CPI growth relative to control group
## Table 1. Share of capital sunk in zombie firms by industry; average and standard deviation across countries

<table>
<thead>
<tr>
<th>Industry</th>
<th>Nace Rev.2 codes</th>
<th>2003–7</th>
<th></th>
<th>2008–12</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Average (%)</td>
<td>Standard deviation (%)</td>
<td>Average (%)</td>
<td>Standard deviation (%)</td>
</tr>
<tr>
<td>Manufacture of food products, beverages, and tobacco products</td>
<td>10–12</td>
<td>7</td>
<td>3</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Manufacture of textiles, wearing apparel, leather, and related products</td>
<td>13–15</td>
<td>12</td>
<td>6</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Manufacture of wood and paper products; printing and reproduction of recorded media</td>
<td>16–18</td>
<td>9</td>
<td>5</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td><strong>Manufacture of coke and refined petroleum products</strong></td>
<td>19</td>
<td><strong>19</strong></td>
<td>25</td>
<td><strong>36</strong></td>
<td>30</td>
</tr>
<tr>
<td>Manufacture of chemicals and chemical products</td>
<td>20</td>
<td>6</td>
<td>4</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Manufacture of basic pharmaceutical products and pharmaceutical preparations</td>
<td>21</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Manufacture of rubber and plastics products, and other non-metallic mineral products</strong></td>
<td>22–23</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Manufacture of basic metals and fabricated metal products, except machinery and equipment</td>
<td>24–25</td>
<td>5</td>
<td>2</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Manufacture of computer, electronic, and optical products</td>
<td>26</td>
<td>9</td>
<td>5</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Manufacture of electrical equipment</td>
<td>27</td>
<td>8</td>
<td>4</td>
<td>7</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Adalat McGowan, Andrews and Millot 2018, OECD
# zombie firms: which sectors? 2

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Manufacture of electrical equipment</td>
<td>27</td>
<td>8</td>
<td>4</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Manufacture of machinery and equipment n.e.c.</td>
<td>28</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Manufacture of transport equipment</td>
<td>29–30</td>
<td>8</td>
<td>8</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>Other manufacturing; repair and installation of machinery and equipment</td>
<td>31–33</td>
<td>6</td>
<td>3</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Electricity, gas, steam, and air conditioning supply</td>
<td>35</td>
<td>5</td>
<td>8</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Water supply; sewerage, waste management, and remediation</td>
<td>36–39</td>
<td>12</td>
<td>13</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Construction</td>
<td>41–43</td>
<td>7</td>
<td>4</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Wholesale and retail trade; repair of motor vehicles and motorcycles</td>
<td>45–47</td>
<td>6</td>
<td>2</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Transportation and storage</td>
<td>49–53</td>
<td>10</td>
<td>6</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Accommodation and food service activities</td>
<td>55–56</td>
<td>10</td>
<td>5</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td>Publishing, audiovisual, and broadcasting activities</td>
<td>58–60</td>
<td>8</td>
<td>5</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>61</td>
<td>10</td>
<td>12</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>IT and other information services</td>
<td>62–63</td>
<td>8</td>
<td>8</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Real-estate activities</td>
<td>68</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Leg., accounting, manag., architecture, engineering activities, technical testing, and analysis</td>
<td>69–71</td>
<td>11</td>
<td>7</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Scientific research and development</td>
<td>72</td>
<td>11</td>
<td>9</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>Other professional, scientific, and technical activities</td>
<td>73–75</td>
<td>10</td>
<td>9</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Administrative and support service activities</td>
<td>77–82</td>
<td>8</td>
<td>4</td>
<td>10</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Adalat McGowan, Andrews and Millot 2018, OECD
zombie firms, competition and inflation

OECD: manufacturing and services seem to be most affected by zombie shares

- is there a differential effect for mfg and services?
- use external financial dependence as a robustness for zombie share (Acharya et al 2019)?
some more micro points

In the model, higher # of surviving firms implies

- # of entrants fall
- higher quality of entrants

Is it possible to identify entrants? firm age perhaps?

Complementary hypotheses: liquidity squeeze channel (Gilchrist Schoenle Sim Zakrajsek 2017, AER)

- if increased zombie share is interpreted as increase in financial capacity, then GSSZ predict disinflation as well
- paradox of financial strength

Price data for multi-product firms serving multiple industries could help separate
dis-inflation effects begin mid-2012 when ECB lowered deposit rate to zero

- ACEE present a policy tradeoff: industrial policy vs aggregate demand management

- ACEE: more zombies, more industry sales growth → textbook AD
  - corollary of textbook AD story: non-tradable likely to suffer more from demand contraction, so expect more disinflation
  - what is the effect on sales growth for non-zombie firms in non-tradable industries?

A key question: how long lived are the Zombies? (Scylla and Charybdis)
  - temporary: negative markup shocks under constrained policy
  - persistent: persistently lower aggregate productivity
macro effects with temporary zombies: Scylla
NK models with negative markup shocks (with some simplifying assumptions)

- ↓ markup $\rightarrow \pi_t$. Inflation targeting CB lowers policy rate, and generates output boom (Galí 2016, Ch 5)
- At the ZLB or currency unions, this can generate perverse effects (Eggertsson (2012, AER), Eggertsson Ferrero Raffo (2014, JME), Galí Monacelli (2016, AER))
- temporary reduction in markups in the non-tradable sector generates deflationary effects + policy constrained at the ZLB $\implies$ reduction in output
- if firm entry were to decline along with reduction in markups then contractionary effects likely exacerbated (see Cacciatore Duval Fiori Ghironi (2017, WP))
- if markups promote innovation incentives, even longer run effects (Garga and Singh 2016)
Charbydis: persistent effects on GDP (+ self-promotion)

Jordá-Singh-Taylor (2019): *The long-run effects of monetary policy*

Data: 17 advanced economies 1890-2015

Use trilemma to identify monetary policy shocks for open pegs
conclusion

The stagnation in Euro and Japan opened up interesting questions for us

- This paper: low interest rates encourage zombies to thrive and increase competition
- Increased congestion $\rightarrow$ negative spillovers on healthy firms
- Policy transmission interacts with institutional setup to generate perverse effects of aggregate demand management
- Quantify mis-measurement, and “back of the envelope” aggregation

*in my great and unmatched wisdom* ...
ACEE offer horror w/o comic relief, but worth watching (reading)
appendix
some trends

Euro area annual inflation and its main components (%), September 2009 - September 2019 (estimated)
Chart 3.1: Classification structure for the various levels of aggregation of an HICP

- **All-items**
  - Division (2-digit ECOICOP)
    - Food and non-alcoholic beverages (01)
    - Alcoholic beverages and tobacco (02)
    - Other divisions (03 to 12)
  - Group (3-digit ECOICOP)
    - Food (01.1)
    - Non-alcoholic beverages (01.2)
  - Class (4-digit ECOICOP)
    - Fruit (01.1.6)
    - Vegetables (01.1.7)
    - Other classes
  - Sub-class (5-digit ECOICOP)
    - Frozen fruit (01.1.6.2)
    - Fresh or chilled fruit (01.1.6.1)
    - Preserved fruits and fruit-based products (01.1.6.4)
    - Dried fruit and nuts (01.1.6.3)
  - Sub-sub-class
    - Nuts
    - Dried fruit
  - Elementary product group
    - Peanuts
    - Almonds
    - All other nuts
  - Elementary aggregate
    - Peanuts sold in supermarkets in region A
    - Peanuts sold in supermarkets in region B
    - Peanuts sold in other outlets types and in other regions
  - Target sample
    - 500 g to 750 g of roasted peanuts salted or not salted, no shell, organic or non-organic.
    - 0.5 Kg to 1 Kg of roasted or raw peanuts, in shell, organic or non-organic.
  - Product offer (price observation)
    - 600 g jar of brand X of salted roasted peanuts without shell and organic
    - 0.5 Kg bag of brand Y of raw peanuts in shell, non-organic.
Source: Figure 3 from ACEE 2019 (this paper)
details on Eurostat CPI

Harmonized Index of Consumer Prices (HICP)

- household final domestic consumption expenditure aggregated to COICOP - 5 digit product group
- Laspeyres-type chain-linked index with weights calculated annually
- purchaser prices including taxes and discounts
- “measure of pure price change”