When Credit Dries Up: Job Losses in the Great Recession

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Anacapri, August 26-27
Impressive dataset!

Interesting research questions!

Good paper!
Spanish firms hit by a credit supply shock

- Drop in house prices in 2008, crisis of Cajas de Ahorros ("Weak Banks")
  Credit crunch, particularly of Weak Banks (bailed out after 2010)

- Main idea: Relation with a WB before the crisis allows authors to distinguish
  firms more likely to be affected by the shock during the crisis.

- Research question: measuring employment effect of credit crunch.

Assumptions

1. Shock is supply side, caused by crisis of the construction industry.
2. Shock is not anticipated by firms (firms cannot predict solvency of banks).
3. Firms cannot substitute funds internally or externally with other banks or
   firms). In particular, firms borrowing from WB cannot borrow from SB.
4. Effect is loan quantity, not interest rates.
Many important questions

- Why does labor demand fall after a credit shock? Lot of evidence for investment, but not obvious for labor demand. In principle, after the shock firms could cut wages, or substitute capital with labor, with small or zero effect on employment.

- Employment effect therefore depends also on elasticity of labor supply

- Effect mostly on firm closure (extensive margin)? Or do firms survive reducing employment (intensive margin)? Depends also on firing costs

- Did firms over-borrow before the crisis, due to low standards applied by WB?

- Is firms’ response heterogeneous? Firms that are financially dependent should cut more investment, so labor demand response might be amplified in some sectors.

- Are firms with only one bank relation affected more than firms with multiple relations?

- Need a large sample to identify these heterogeneous effects
Impressive dataset!!

217,000 firms (balance sheet, employment). Excludes construction sector.

Central Credit Register (CCR): all business loans above 6,000 euro.

Balance sheet data on all Spanish banks: 47 “Safe Banks” and 33 “Weak Banks” (eventually bailed out by the Government)

Unique feature of CCR data: information on each banking relation – allows distinguishing between firms with one or more than one banking relation.

“Dataset can be taken as Census”

- Purely empirical paper (no theory)
- Many regressions, specifications, fixed effects, robustness checks, IV, etc.
- Potential problems: classification errors and interpretation of results.
Empirical specification

\[ \ln(1 + n_i) = \alpha + \delta WB_i + \gamma (POST_i \times WB_i) + \beta \times POST_i + \text{other variables} \]

**WB dummy:** \(\frac{\text{Loans from WB}}{\text{Assets}}\) above the third decile of the distribution in 2006

**Findings:** \(\gamma\) about -0.06, but lot of heterogeneity. Employment effect:

1. Mostly on firm closure (extensive margin) rather than on employment of surviving firms (intensive margin). Interesting to pursue further, distinguishing the two margins.

2. Present mostly in some industries (Manufacturing, Electricity, Gas and water, Transport, Machinery). Interesting! Are these more financially dependent?

3. Present in firms with multiple banking relations and attachment to WB but not in firms with only one bank relation. Puzzling result.
My comments

1. Misclassification of treatment and control groups

2. Interpretation of results / extensions

3. Is large always better?
1. Misclassification of treatment and control groups

\[ \ln(1 + n_{i}) = \alpha + \delta WB_{i} + \gamma (POST_{t} \times WB_{s}) + \beta \times POST_{t} + \text{other variables} \]

\( \gamma \) is unbiased if there is no classification error

But WB is measured with error, so we have error ridden measures \( \tilde{WB} \) and \( (1 - \tilde{WB}) \).

- There are some “false positives” - firms in \( \tilde{WB} \) that are unconstrained - and “false negatives”, firms in \( (1 - \tilde{WB}) \) that are constrained. Furthermore, it is likely that classification error changes over time.

- This induces \textit{attenuation bias}, i.e. the estimated \( \gamma \) shows too little effect.

- Increasing (or reducing) the threshold for \( \tilde{WB} \) would not do, because the probability of “false negatives” falls, but the probability of “false positive” increases.

- \textit{What matters is the sum of the two probabilities, so estimates are still biased.}
Alternative

Loans from WB \( \frac{\text{Assets}}{\text{Assets}} \) is a continuous variable, but treated as a dummy variable

“Dummification” of this continuous variable creates the potential for misclassification: some treated firms in the control group, and vice versa. Furthermore, valuable information is lost.

**Estimate directly:**

\[
\ln(1 + n_{it}) = \alpha + \delta \frac{\text{Loans from WB}}{\text{Assets}} + \gamma \left( POST_i \times \frac{\text{Loans from WB}}{\text{Assets}} \right) + \beta POST_i + \text{other variables}
\]

Using data on bank localization prior to the crisis as **instrument**

Or define an exposure index (0, 1): \( \frac{\text{Loans from WB}}{\text{Total Loans}} \)
2. Interpretation of results

For policy purposes or macro models we would like the elasticity: \[ \frac{\partial \log \text{Employment}}{\partial \log \text{Credit}} \]

- But the paper estimates only differential employment effect of WB vs. SB.
- It tells us that the problem is more severe for firms operating with WB.
- But what is the overall effect of the shock on employment?
- Not obvious if -6% is large or small, what is the benchmark?
Extensions

Multiple banking is a choice variable

Employment does not fall in firms with exclusive relation. Explanation: WB extend credit to firms that are very dependent on them, and for which firm closure implies a large loss for the WB. This argument is only partly convincing, because it does not explain:

- why WB prefer to lend to firms with exclusive relations, while SB don’t. Like SB, why don’t WB internalize the soft budget constraint created by relationship lending?

- why risky firms prefer to concentrate their loans in a single bank. In Spain multi-banking is the rule: the median is 10 relations, much higher than OECD average, lending support to the liquidity argument of Detragiache et al (borrow from more banks to avoid closing profitable investment in case credit dries up).

Employment composition is also a choice variable

Some evidence that labor demand is sensitive to adjustment costs: temporary workers are laid off, not permanent ones. But at the same time, effect is mostly on firm closure (intensive margin). Interesting! But pursue further

- Would be useful to add wages to the picture.
- Possible to distinguishing between low- and high-skilled workers?
3. Is large always better?

Having more data does not necessarily make things easier.

3.1. Statistical inference when the sample “is” the population

If we really have the whole population, there is no need to go into statistics to test for difference in means. You know exactly how big the difference is, and there is no need to test it any more.

- If you want to use standard inference, a way around is to appeal to super-populations that the current census represents.

- A population at a given time may be a sample of a larger population over time and/or countries.

- One would need to argue something along these lines for the population of Spanish firms and banks.
3.2. t-test in very large samples

- With a very large sample, the t-test has a lot of power and confidence intervals are small, so even small differences of coefficients are significant.

- Granger (2003): if the sample size is sufficiently large, then it's virtually impossible not to reject almost any hypothesis.

- With very large samples the empirical issue is more on magnitudes than on statistical significance. But once more, we need a benchmark for evaluation.
Comments for the authors

- Use of log(1+n) not appropriate

- Difference in riskiness of WB and SB: probably more informative if you do not add other controls – closer to what might be perceived by firms

- Many of the variables in the diff-in-diff regression are endogenous, as they reflect firms’ choice: debt, share of temporary employment, credit application, defaults, etc.