Discussion of “Credit Constraints and Firm Productivity: Evidence from Italy”

by F. Manaresi and N. Pierri

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Assessing the impact of credit constraints

- **Large literature about credit constraints**
  - Main focus is the impact on investment in tangible capital, R&D, etc. State variables or “dynamic inputs” [what can be stored / decisions that can be delayed over time]
  - Complementary questions:
    - Potential impact on **flow variables**? [“static inputs”, e.g. labor]
    - Potential impact on **productivity**? [residual]

- Paper makes use of the **Olley-Pakes productivity estimation framework** together with **credit supply shifters à la Amiti and Weinstein (forth.)** to provide insights about these aspects
Roadmap for discussion

1. **Conceptual framework**: profit maximization and lagrange multipliers?
2. **Empirical framework**:
   Are all of the identification assumptions of the OP framework met?
   Heterogeneity (validity of IV) depending on the number of lenders?
3. **Quantification and interpretation**: what mechanisms?
The conceptual framework in section 3 is a little bit elusive.
Does not provide much guidance about how to interpret specification and estimates?

Proposed alternative (e.g. Banerjee and Moll, AEJMacro, 2010):

$$\max_{K_t, L_t, (p_t)} \Pi(\omega_i, r, w) = p.\omega_i. f(K_t, L_t) - r.K_t - w.L_t$$

$$S.T. \quad K_t \leq \Lambda_{it}K_{t-1}$$

Magnitude of credit constraints to be measured by Lagrange multiplier $\mu_i$ rather than $\Lambda_{it}$ (constraint might not bind), e.g.

$$p_i.\omega_i. \left( \frac{\partial f(K, L)}{\partial K} \right) = r + \mu_i$$

Further open questions:

- What mapping between such a firm-level collateral constraint and bank level credit supply shifters?
- Enrich framework to be able to conceptually think about impact on $L$ and $\omega_i$
Empirical framework (1) : TFP estimation

I missed a **precise discussion of the identification conditions** in your set-up: Is the Olley-Pakes setting preserved?

- w/o alteration of the Markov assumption for $\omega_i$, the procedure is only convergent under $H_0$
  ($H_0 : \omega_i$ unaffected by credit constraints)
- Go directly for the estimation of a very flexible specification of the production function $f^s(k_{it}, l_{it})$?
- Collateral constraint of $k_{it}$ also hinders the use of capital growth rate as a proxy variable
  (Probably put the polynomials of the Lagrange multiplier?)

Perhaps a relevant reference: **De Loecker and Warzynski, AER, 2012**

- more flexible parametrizations of $f$ are identified under timing assumptions *à la* Olley and Pakes (1996)
- more flexible processes for $\omega_i$ (insert credit supply shifters?)
  e.g. your equation (15) has to be incorporated into the estimation procedure
Empirical framework (2) : credit supply shifter and IVs

$$\Delta c_{ibt} = \phi_{bt} + \chi_{it} + \xi_{ibt}$$

- **Descriptive statistics over time for bank level credit shifters** $\phi_{bt}$?
  In particular during the inter-bank market collapse
  Setting requires some heterogeneity in the magnitude of the shock

- **Descriptive statistics for firm level components** $\chi_{it}$?
  Can this information be used in some way to check the magnitude of credit constraints faced by the firm?
  (the firm-level term should not compensate the bank-level component)

- Check more formally the validity/differential strength of IVs depending on the number of lending relationships:
  - Do firms add a lending relationship when their lenders are hit by a shock?
  - Validity of IV depending on the number of lending relationships? (ability to diversify?)
Quantification and interpretation

- **Aggregate quantification is missing**
  - would be informative to discuss likely channels
  Maybe borrow from Amiti and Weinstein (JPE, forth.)?

- **Discussion of the impact of credit tightening on TFP**:
  - R&D should play rather in the long term?
  - Export orientation: difficult to argue that there are frequent entries and exits given the usual models in the literature?
  - **Bank credit tightening could affect demand as well**
    Maybe this is what you see?
    Incorporate a formal demand side (e.g. De Loecker, Ectra, 2011) to assess this hypothesis?
    Take advantage of potential geographical variation and estimate separate specification depending on the (local, global) market of firms?
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