Credit Market Outcomes

- Adverse Selection and Moral Hazard problems typically characterize the lender (bank)-borrower (firm) relationship.
- Typically banks attempt to overcome these informational problems by engaging in screening, contracting, and monitoring activities (Diamond 1984; Berger and Udell 1990; Diamond 1991 Berger et al., 2001).
- Loan contracts offered by banks are multidimensional and specify a set of Terms and Conditions (T&Cs hereafter), with the aim to mitigate credit risk stemming from a lending relationship, and to enhance their ability to monitor borrowers over the time span of the loan contract (Strahan 1999; Watanabe 2005).

- T&Cs fall into two categories: (i) Price T&Cs, such as the *interest rate* and the *cost of financing* (any other charges, fees and commissions), and (ii) Non-Price T&Cs, such as *collateral requirements*, the *loan size*, the *loan maturity*, and *loan covenants*.
- Banks use non-price T&Cs such as maturity and debt covenants to facilitate monitoring (Berlin and Loeys 1988; Berlin and Mester 1992). Similarly, they use other non-price T&Cs such as loan size and collateral to limit credit losses. Restricting loan size limits the bank's potential exposure, while higher collateralization reduces loss given default by potentially enhancing recovery rates.
- In a similar vein, shortening the contractual maturity of loans limits risk since the lender is exposed to the underlying credit risk for a shorter horizon. However, non-price T&Cs elements are not sufficient to fully eliminate risk, and therefore banks price the residual risk through the interest rate and other types of charges and fees (Strahan 1999).

- Let us briefly discuss the direction in which these firm characteristics are expected to affect T&Cs according to economic theory. Firm age is usually viewed as an indicator of firm's quality, since longevity may contain a signal for survival ability and quality of management, as well as, the accumulation of reputational capital (Diamond 1991; Oliner and Rudebusch 1992).
- Moreover, the information gap is relatively narrower for older firms given their longer track record (Petersen and Rajan 1994; Cressy 1996).
- Another dimension that may be related to the degree of asymmetric information is firm size. Larger firms are more likely to have developed a reputation over time that lessens their incentive to behave in ways that could increase the probability of experiencing financial distress.

- In contrast, smaller firms face higher relative probability of failure (Jensen and McGuckin 1997) and proportionately higher monitoring costs (Boocock and Woods 1997). In addition, smaller firms may have lower collateral relative to their liabilities than larger ones, and unit bankruptcy costs are likely to decrease with size (Gertler and Gilchrist 1994; Hu and Schiantarelli 1994; Gilchrist and Himmelberg 1995; Audretsch and Elston 2002; Vijverberg 2004).
- In the context of the Merton (1974) option-pricing model, leverage is used as an inverse proxy of firm credit quality because more levered firms, ceteris paribus, face a greater likelihood of insolvency. In addition, leverage could exacerbate moral hazard problems since highly levered borrowers may have a greater incentive to substitute high risk assets for low risk ones after a loan. In addition, more profitable firms or firms with higher cash flow are expected to be able to borrow more from banks since they are more likely to have the means to service their debt.

- In situations where lenders and borrowers cannot overcome the inherent informational asymmetries that give rise to the phenomena of adverse selection and moral hazard, one might observe a market outcome where Credit Rationing occurs (Stiglitz and Weiss, 1981).
- Credit Rationing is an extremely important banking market outcome for it is known to constrain rationed firms' investment and employment choices, thereby adversely affecting their performance and even having detrimental effects on their survival prospects

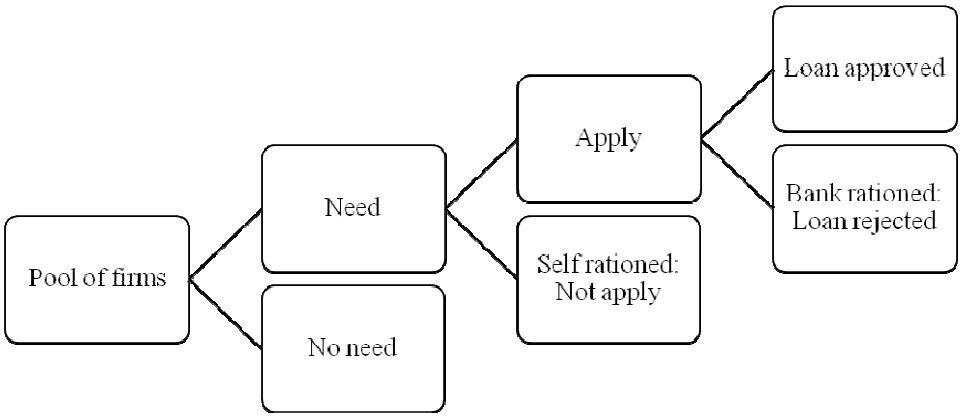
- The original (quantity) Credit Rationing concept, as theoretically demonstrated by Stiglitz and Weiss (1981), identified a potential borrower (firm) as rationed, provided that it was willing to bear the ongoing loan interest rate, but was either granted a loan that fell short of the amount requested (Type-1 rationing), or was denied credit altogether by the bank (Type-2 Rationing).
- Thus, at the early stages of the literature, rationed firms were necessarily a subset of loan applying firms. In other words, unless a firm explicitly revealed its demand for credit, there was no possibility to be classified as rationed.

- Later on the Credit Rationing concept was broadened to include potential borrowers who did not apply for a loan, although they need edit, because of fear of rejection; known in the literature as 'discouraged borrowers' (Jappelli, 1990; Cox and Jappelli, 1993; Piga and Atzeni, 2007) or 'pre-emptively rationed' borrowers (Mushinski, 1999).
- The prevalence of the phenomenon has been documented empirically; with Levenson and Willard (2000) and Freel *et al*., (2012) reporting that there are twice as many discouraged borrowers as rejected borrowers in the US and the UK, respectively.
- Sanchez-Vidal et al., (2012) focusing on Eurozone SMEs report that the average discouragement rate is about 8%, while Ferrando and Mulier (2014) using a similar dataset find that the discouragement rate is on average about 15%, and discouraged firms are about twice as many as rejected firms.

- Using this extended definition of rationing, although firms share their common need for external credit, there are two salient differences between them. First, discouraged borrowers do not reveal their demand for credit, while their applying counterparts do so. Second, the discouraged firms are essentially Self-Rationed, while rejected applicants are Bank-Rationed.
- Thus, the proper empirical modeling of Credit Rationing is a rather delicate task and not as straightforward as one might think, once the conditionalities present are taken into account.
- Let us start with the possible bank-rationing outcomes, where firms are either bank-rationed or not bank-rationed. The sum of the two groups of firms directly relates to the count of firms who actually applied for a bank loan.

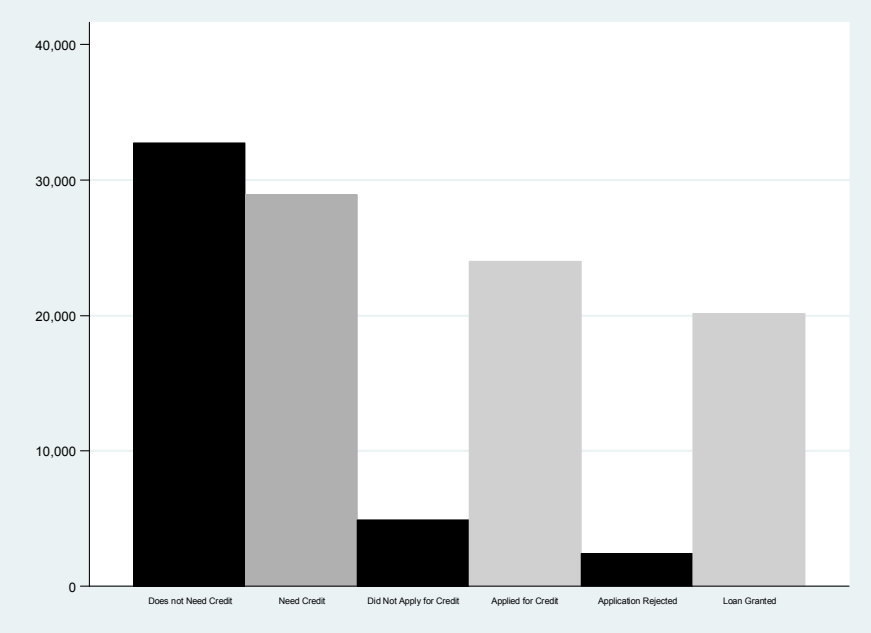
- Hence, for bank-rationing outcomes to be observed, firms must have cleared the application hurdle, or in other words, bank-rationing outcomes require that a firm is not Self-Rationed. One more conditionality is in order, since for the Self-Rationing outcome to be observed, firms must be in need of external financing.
- Thus, the whole sequence has three nodes, which for demonstration purposes we call *Need*, *Apply*, and *Bank Rationing*, with each node having two branches.

Graph 1. Credit Market Outcomes



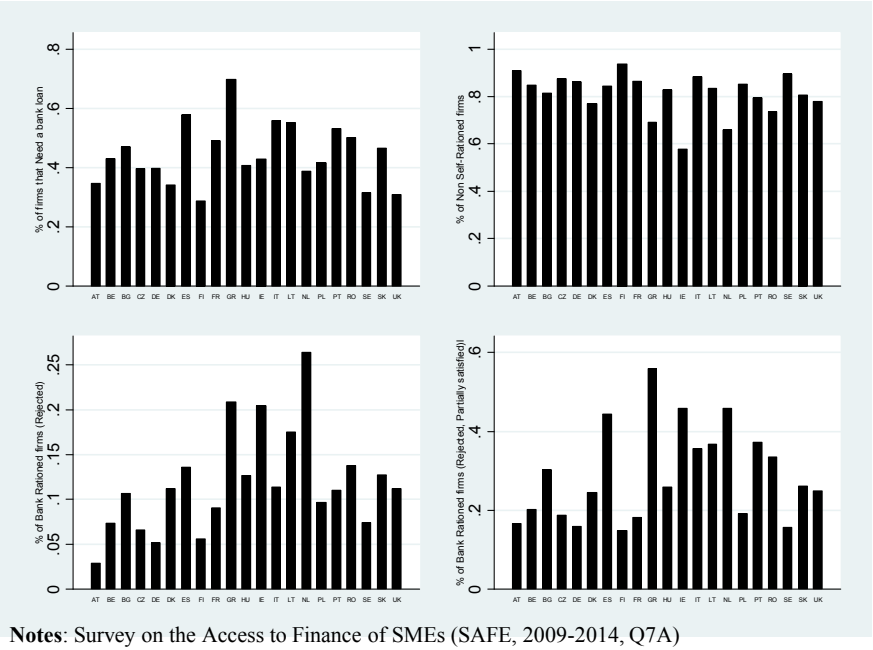
Some facts from Eurozone

Graph 2. Firm counts across credit market outcomes



Source: Survey on the Access to Finance of SMEs (SAFE, 2009-2014, Q7A)

Graph 3. Prevalence of Need, Non-Self Rationed (Apply) and Bank Rationed by Country



Notes: Survey on the Access to Finance of SMEs (SAFE, 2009-2014, Q7A)