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J. Finan. Intermediation

journal homepage: [www.elsevier.com/locate/jfi](http://www.elsevier.com/locate/jfi)

## Credit rationing in small firm–bank relationships

Karolin Kirschenmann<sup>1,\*</sup>

Aalto University School of Business, P.O. Box 21220, FI-00076 Aalto, Helsinki, Finland

### ARTICLE INFO

#### Article history:

Received 17 June 2014

Available online xxx

#### Keywords:

Credit rationing  
Loan applications  
Small firm lending  
Asymmetric information

### ABSTRACT

I study credit rationing in small firm–bank relationships by using a unique data set of matched loan applications and contracts. I establish the degree of credit rationing by relating a firm’s requested loan amount to the bank’s granted amount. In line with theoretical predictions, credit rationing is higher for opaque than transparent firms at the beginning of their bank relationships and decreases over time for both. After testing for several alternative explanations, the results suggest that information and incentive problems explain the observed credit rationing and its dynamics.

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### 1. Introduction

*“The struggle small firm owners face to access finance to grow their operations is a global issue, affecting fast-growing emerging nations as much as developed countries.”*

- Financial Times, June 1, 2012

\* Corresponding author:

E-mail address: [karolin.kirschenmann@aalto.fi](mailto:karolin.kirschenmann@aalto.fi)

<sup>1</sup> I am grateful to an anonymous referee and the editor as well as Franklin Allen, Mitchell Berlin, Martin Brown, Geraldo Cerqueiro, Lucy Chernykh, Hans Degryse, Ralph De Haas, Daniel Foos, Todd Gormley, Mark Jenkins, Matti Keloharju, Leonard Nakamura, Lars Norden, Deniz Okat, Steven Ongena, Christian Opp, Maria Fabiana Penas, Michael Roberts, Enrico Sette, Sascha Steffen, Luke Taylor, Eva Terberger and Wolf Wagner. I am also grateful to seminar participants at the University of Mannheim, the Wharton School of the University of Pennsylvania, the Federal Reserve Bank of Philadelphia, BI Oslo, NHH Bergen, the Norges Bank, the Aalto School of Business, the University of Maastricht, Pompeu Fabra, Erasmus School of Management, the University of St. Gallen, as well as participants at the 6th Annual Conference of the Research Committee Development Economics of the German Economic Association, the 2010 Muenster Banking Workshop, the 37th Annual Meeting of the European Finance Association, the 4th Swiss Winter Conference on Financial Intermediation, the 2011 FIRS Conference, and the IBFA Summer Meeting 2012 for helpful comments and suggestions. I am especially grateful to the management and employees of the bank that provided me with the data. The paper was partially completed while I was visiting the Finance Department of Tilburg University and the Financial Institutions Center of the Wharton School of the University of Pennsylvania. I greatly appreciated their hospitality.

<http://dx.doi.org/10.1016/j.jfi.2015.11.001>

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The lack of access to finance for small and opaque firms receives significant attention not only from the media but also from academics and policy makers (see, e.g., Beck et al., 2008; World Bank, 2007; European Commission, 2011; IFC, 2011). Despite this common idea about the importance of the topic, the empirical evidence on one aspect of it – the extent of credit rationing due to asymmetric information – is scarce. Notable exceptions are Berger and Udell (1992) who use an indirect approach and Banerjee and Duflo (2014) who exploit policy changes in a directed lending program to study credit rationing. So far research has not explored more direct avenues that incorporate demand data to establish the actual extent of credit rationing and its dynamics during bank-firm relationships.

Credit rationing comes in two forms. Borrower rationing (type 1) means that some borrowers get no loan at all although they may have profitable investment projects and are indistinguishable from those borrowers who receive loans (e.g., Stiglitz and Weiss, 1981). Loan size rationing (type 2) means that, at the current interest rate, all borrowers are served but demand a larger loan amount than they finally receive from the bank (e.g., Jaffee and Russell, 1976). In practice, borrower rationing implies for banks to turn away for good some profitable clients with whom they would actually want to establish a relationship to make future business. Therefore, (initial) loan size rationing might be expected to play an important role for banks to deal with adverse selection and moral hazard problems in environments with high informational asymmetries, such as in lending to small firms. Direct evidence on loan size rationing is particularly scarce due to a lack of micro-level demand and supply data.

In this paper, I provide such direct evidence on the extent of loan size rationing by linking the firms' requested to the bank's granted loan amount. Therefore, this study fits with a growing literature that exploits information from loan applications. Puri et al. (2011b), Jimenez et al. (2012) and Berg and Kirschenmann (2015) use loan applications to separate loan supply from demand. Because the wedge between demand and supply is informative about the resolution of informational asymmetries over time, I investigate not only how the wedge relates to firm, loan, and relationship characteristics, but also how it evolves over sequential loan contracts. This dynamic aspect differentiates my study from Cheng and Degryse (2010) and Becchetti et al. (2011) who also observe requested and granted loan amounts.

My evidence comes from analyzing a unique panel data set from an emerging market bank focused on lending to small firms of nearly 97,000 matched loan applications and loan contracts over a four-year period. The information from this data set helps to provide an understanding of whether the ability of banks to produce information (e.g., Diamond, 1984; Ramakrishan and Thakor, 1984; Boyd and Prescott, 1986) can overcome rationing.

Having a panel data set has several advantages. First, I can follow borrowers during their relationships with the bank and establish the dynamic patterns of requested and granted loan amounts that arise when borrowers and banks interact repeatedly. In contrast, the existing evidence on the impact of a strong bank-borrower relationship on credit availability relies on cross-sectional data and does not explicitly observe loan demand (e.g., Petersen and Rajan, 1994, 1995; Cole, 1998; Elsas and Krahenen, 1998). Ioannidou and Ongena (2010) follow borrowers over several interactions with their lenders, but do not establish the role that loan requests play. Second, I can control for unobserved borrower heterogeneity that might affect credit rationing (e.g., entrepreneurial ability or time-invariant firm risk). Regressions with firm fixed effects focus the analysis on within-firm variation over time and alleviate the potential endogeneity problem that these unobservables might be correlated with the included indicators of informational asymmetries. I also use year-quarter fixed effects to control for unobservable time-specific effects.

The results show that some loan size rationing due to informational asymmetries is present in lending to small firms: opaque firms (i.e., firms that are comparatively young or small or have no other liabilities when starting to borrow from the bank) are more rationed than more transparent firms and the degree of credit rationing decreases over loan sequences. These findings are in line with the predictions of the credit rationing theories that rationing is the outcome of information and incentive problems in bank lending.

Several alternative rationales exist that might explain the observed heterogeneity in the wedge between requested and granted loan amounts. Young and small firms might have larger growth opportunities or increase their borrowing capacity more (e.g., through increasing equity stakes or higher-quality collateral) over time than older and larger firms. I control for an array of firm characteristics such as size, disposable income, leverage, age and the type of collateral that was pledged. However, the observed

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