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Bank market power, factor reallocation, and aggregate growth☆

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ABSTRACT

Using a unique firm-level sample of approximately 700,000 firm-year observations of German small and medium-sized enterprises (SMEs), this study seeks to identify the effect of bank market power on aggregate growth components. We test for a pre-crisis sample whether bank market power spurs or hinders the reallocation of resources across informationally opaque firms. Identification relies on the dependence on external finance in each industry and the regional demarcation of regional banking markets in Germany. The results show that bank markups spur aggregate SME growth, primarily through technical change and the reallocation of resources. Banks seem to need sufficient markups to generate the necessary private information to allocate financial funds efficiently.

1. Introduction

Does bank market power help or hinder the growth of informationally opaque firms? If they help, how do banks influence the growth of such firms: by enabling them to grow more productive or by aiding more productive firms in their efforts to grow? The exact role of banks in firm growth has been largely ignored in prior research, which is surprising, considering financial intermediaries' responsibilities for selecting productive projects and monitoring borrowers. Both theoretical arguments and empirical outcomes highlight that the effect of bank market power on firm growth is ambiguous (Petersen and Rajan, 1995; Zarutskie, 2006; Canales and Nanda, 2012; Cetorelli and Strahan, 2006; Berger et al., 2007). Banks with market power may hinder growth if they can extract rents from existing lending relationships. The ability to lock in firms may also remove incentives for banks to finance more productive new entrants (Cetorelli and Gambera, 2001; Cetorelli and Strahan, 2006). Market power may be particularly problematic for small and medium-sized enterprises (SMEs), which tend to be informationally opaque and rely more on bank funding (Petersen and Rajan, 1995; Zarutskie, 2006). Yet if bank market power is too low, banks' incentives to generate information about borrowers may diminish (Marquez, 2002), which could lead to resource misallocations

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because banks generate insufficient information to identify the most productive firms (Dell'Ariccia and Marquez, 2004). Similarly, if intense competition prevents banks from extracting rents from firms' innovative investments, they may not lend to such innovators (Petersen and Rajan, 1995).

In response to these ambiguous predictions, we make an initial attempt to distinguish the effects of bank market power on technical change (firms growing more productive) and on resource allocations (growth by more productive firms) (Beck et al., 2000; Carlin and Mayer, 2003; Kerr and Nanda, 2009). The lack of empirical evidence about the importance of resource reallocation among firms for aggregate growth (Basu and Fernald, 2002; Hsieh and Klenow, 2009; Basu et al., 2009; Syverson, 2011) appears largely due to the very high data demands, including comprehensive firm-level information that is rarely available for non-listed corporations, such as SMEs.

To overcome this challenge, we analyze the effect of bank market power using a novel data set of approximately 100,000 informationally opaque SMEs in Germany between 1996 and 2006, which we combine with supervisory data from all banks in Germany. We estimate the extent to which aggregate growth is due to input growth, technical change, and resource reallocation. To identify the relationship between bank market power and growth components, we exploit the regional demarcation of banking markets in Germany, together with the difference in the structural dependence of firms on external finance across industries (Rajan and Zingales, 1998; Claessens and Laeven, 2005; Friedrich et al., 2013). In extending country-industry-level studies, we apply this difference-in-difference approach to explain industry-region-specific output components generated from firm-level data. That is, we use region-specific banking market power indicators obtained at the bank level and industry-specific dependence on external finance (Rajan and Zingales, 1998).

In addition to distinguishing between the effects of bank market power on technical change and on resource reallocation, we use our firm- and bank-level data to investigate differences in effects for more and less opaque SMEs and for different types of banks (i.e., commercial, savings, and cooperative banks). Our within-country setting eliminates concerns about controlling sufficiently for cross-country differences of financial systems and institutions (Claessens and Laeven, 2005).

We find that bank market power significantly increases SME growth by stimulating both technical change and resource reallocation. An increase of Lerner indices by 1 percentage point increases aggregate SME output growth by around 0.1%, at the median level of industry dependence on external finance. The increase can be attributed approximately equally to faster technical change and greater reallocation. We find several indications that growth effects are largest for less opaque firms. For SMEs in industries that depend substantially on external finance, we find insignificant growth effects in response to increasing bank markups. Overall, banks require a minimum level of markups to generate useful private information, which they can use for an efficient selection and risk monitoring, which ultimately leads to growth. Triple interaction effects across market power and the regional bank market structure further show that the positive growth effects of bank market power differ, conditional on the concentration of regional markets. This finding corroborates prior studies, which show that market structure and market power correlate, but reflect different aspects of competition. For our pre-crisis sample of German SMEs, the reallocation component of growth is significant only in response to increasing bank markups when markets are also highly concentrated. This result supports theories that emphasize the importance of sufficiently large customer pools, together with stable bank margins as prerequisites for the generation of private information that is crucial for efficient lending choices.

The remainder of this article is organized as follows: Sections 2 and 3 present the data and method to estimate and decompose output growth. We discuss the main results in Section 4, conduct robustness checks in Section 5, and conclude in Section 6.

2. Sample and data

The data comprise a proprietary sample of corporate clients of German savings banks. This data set has been used previously (Behr et al., 2013; Gropp et al., 2014). It contains the financial accounts of all corporate firms that applied for a loan at a German savings bank between 1996 and 2006. We consider only firms with at least three available balance sheets and exclude all firms with less than two consecutive years of data, in which some production information is missing, or for which labor expenses or material costs are greater than sales. We also leave out firms from the mining industry, because of large outliers, and exclude two regions, namely two urban centers that are geographically not adjacent and that host most of Germany's multinational enterprises. We winsorize, at the 1st and 99th percentiles of all production function variables, to control for any remaining outliers. The sample is unique in providing good coverage of very small firms for which financial accounts typically are not available, though they account for a substantial share of total output in the German economy. The average (median) firm sales are slightly less than € 5 million (€ 1 million). Thus, according to the EU's definition of SMEs, almost 65% of our sample consists of micro firms (up to € 2 million sales), another 25% are small firms (up to € 10 million sales), and a further 8% are medium-sized firms (up to € 50 million sales). Only 2% of the firms in the sample are large. In terms of industry, 25% of the firms are in manufacturing, 25% are construction firms and 50% are in services, mostly business services such as accountants or lawyers (see Table 1). The final data set comprises 696,119 observations between 1996 and 2006. In terms of total output, the SMEs in our sample account for approximately one-seventh of German gross domestic product.

The left panel in Table 1 depicts the mean and standard deviation of the output, production factor, and intermediate factor growth variables. The large dispersion in output and factor growth across firms, even within each industry, illustrates the potential importance of the reallocation of resources from unproductive to productive firms. Mean growth rates further emphasize the importance of cross-industry variation in terms of growth and dependence on external finance (right side in Table 1). This summary of the firm-level data, stratified by industry, bodes well for our approach of explaining cross-regional growth differences by industry and regional banking market traits and the industry need for external financing.

3. Identification and estimation method

3.1. Identification

To identify the effect of regional differences in banking competition on SME growth by industry, we follow the strategy suggested by Rajan and Zingales (1998) and subsequently pursued by, for example, Claessens and Laeven (2005), Kroszner et al. (2007) and Friedrich et al. (2013).

The first identifying assumption is that dependence on external finance differs across industries for structural reasons. We measure the equilibrium dependence on external finance (*ED*) using Compustat data for U.S. firms, because we assume that they face the lowest financing constraints. Similar to Rajan and Zingales (1998), we define *ED* to equal capital expenditures less cash flow from operations divided by capital expenditure. This measure gauges the share of investment that is not financed through retained earnings.