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Local growth and access to credit: Theory and evidence

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ABSTRACT

We theoretically and empirically investigate the effects of access to credit on local growth using a Schumpeterian growth model and assuming monopolistic competition between differentiated products of the banking system. We show that access to credit exerts a positive effect on local economic growth. To validate the theoretical prediction we use data on firms and bank branches from 18 emerging European economies.

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1. Introduction

Access to credit is a key driver of innovation, productivity and local economic growth. This paper empirically and theoretically studies this link using a Schumpeterian growth model and monopolistic competition among differentiated products in the banking system. We use the same growth model as Diallo and Koch (2017a), who based their work on Howitt and Mayer-Foulkes (2005); Aghion et al. (2005); Acemoglu et al. (2006). In this model, the engine of growth is innovation. The final good uses intermediate goods and labor which are produced by entrepreneurs, who we refer to as innovators and have monopoly power since they use technology that is closest to the frontier. Innovation in the intermediate goods sector determines growth rate, and the distance from the world technological frontier. Innovators incur costs that they may cover by borrowing, which depends on the probability of the entrepreneurial innovation, and is proportional to the proximity to the world technological frontier. If successful, innovators make profits that are also proportional to this proximity. The novelty in our model is that we analyze the relationship between innovators and banks using monopolistic competition in the banking sector.

Specifically, to measure the effects of access to credit on local growth, we use monopolistic competition in the banking system à la Salop (1979). Commercial banks are located on a circle and compete over the interest rate charged on lending to entrepreneurs (loan rate). We then use symmetric equilibrium in the banking sector, according to which banks charge the

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same loan rate. Banks have to pay a proportional transaction cost on lending, and an interest rate on inter-bank borrowing. The number of banks is endogenously determined in equilibrium using a zero-profit condition. Monopolistic competition in the banking sector allows us to introduce the effects of access to credit on innovation and on growth. Moreover, when each borrower (innovator) borrows from a bank, he or she incurs a transportation cost λ proportional to the distance between the borrower's location and that of the bank. We take λ as a proxy for the measure of access to credit. The transportation cost λ can be interpreted as a barrier to entry. It may take the form of outright restrictions on foreign banks, restrictions on the scope of a bank's activities, restrictions on the geographic area in which banks can operate, or excessively restrictive licensing requirements, following (Abiad et al., 2010). Reducing the value of λ facilitates access to credit for innovators and at the same time increases the innovation rate; we provide more detail on this below. We also include entry costs in the banking sector F , and the bank's transaction cost of a loan as an alternative measure of accessing credit, γ_T .

By free entry in the banking sector, we theoretically determine the number of banks and show that it depends positively on the level of access to credit, λ . The access to credit is measured by the transportation costs for entrepreneurs; as we will show below, these costs are proportional to the distance between a bank and a marginal entrepreneur. We also show that the probability of entrepreneurial innovation is an increasing function of the level of access to credit. This implies that larger numbers of banks arise in countries for which the distance is small or for which access to credit through free entry tends to reduce the distance. Access to credit tends to favor the emergence of new banks in the economy and facilitates access to credit for entrepreneurs. This process increases the innovation rate, which positively affects the overall productivity of the economy. This result is very important for our paper, as it shows that barriers to entry (such as low access to credit) have a negative effect on economic growth.

In order to verify our theoretical prediction, we perform an empirical analysis using firm-level and bank-branch data. We use the European Bank for Reconstruction and Development (EBRD)-World Bank's Business Environment and Enterprise Performance Survey (BEEPS) for 18 emerging Eastern European economies and data on bank branches obtained from Beck et al. (2017). The information gathered from these datasets allows us to match firms and bank branches by locality using only firms that applied for loans or lines of credit in the last fiscal year. Finally, we draw circles around the geo-coordinates of each firm and then link the firm to only those bank branches inside that circle. We then regress local growth measured as the logarithm of firm sales for the last fiscal year on the distance between the firm's location and local banks. We find that there is a negative and significant relationship between this distance and firm growth. Specifically, we show that access to credit measured by the distance increases local growth. To the best of our knowledge, this is the first finding of its kind in the existing literature that theoretically and empirically links access to credit and local growth. To test the robustness of our results, we use firm-level variables and country characteristics as controls. In addition to our main finding, we show that the growth rates of audited firms are faster, and that of government-owned entities and exporters are slower. We also find that financial constraints decrease firm growth. In addition, we find that the growth rates of firms in the manufacturing sector are slower, and that of services faster.

To the best of our knowledge, there are no papers that have investigated the relationship between access to credit and local economic growth. However, (Beck et al., 2005) use the same methodology and type of data to investigate the link between financial and legal constraints and growth using firm-level data for 54 countries. Recently, (Beck et al., 2017) use the same data to analyze how relationship banking impacts funding for SMEs in normal and bad times for 21 Eastern European countries. They find that relationship banking decreases financial constraints during crises but not in normal times, a finding in line with Diallo (2017b) who showed that bank efficiency increased growth for industries that were most dependent on external finance during the 2009 financial crisis. Our paper is different from these in two ways. First, we theoretically present a Schumpeterian growth model and monopolistic competition within the banking system to investigate the impact of access to credit measured by the distance between a firm location and the bank on local growth. Second, using micro-data we measure the effect of this distance on the growth rates of firms.

The remainder of the paper is organized as follows. Section 2 outlines the basic structure of the theoretical model, Section 3 tests the theoretical predictions using empirical investigation. Section 4 summarizes the findings.

2. Theoretical model

2.1. A simple Schumpeterian growth model

We use the same Schumpeterian growth model as in Diallo and Koch (2017a), a paradigm developed during the past decade by Howitt and Mayer-Foulkes (2005); Aghion et al. (2005); Acemoglu et al. (2006). We assume that time is discrete, that there is a continuum of individuals in each country, and that there are J countries, indexed by $j = 1, \dots, J$. These countries do not exchange goods and factors, however; they are technologically interdependent in the sense that they use technological ideas developed elsewhere in the world. Each country has a fixed population, L , which we normalize to one $L \equiv 1$, so that aggregate and per-capita quantities coincide. Each individual lives two periods and is endowed with two units of labor services in the first period and none in the second.

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