



## Firm Entry Barriers, Growth Constraints, and Job Creation

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***We use new data on credit transactions and formal firms in Brazil to identify the effects of a large-scale expansion in credit for small and medium enterprises.***

### Introduction

Growing evidence points to the importance of startups in shaping aggregate employment patterns in developing countries. However, barriers to firm entry and constraints on subsequent growth remain pervasive. We investigate how financial constraints distort entry decisions among potentially productive entrepreneurs and limit growth of promising young firms. We explore this mechanism in the context of a large-scale expansion of credit for small and medium enterprises (SMEs) in Brazil beginning in 2003. Working closely with the National Development Bank (BNDES) and Central Bank of Brazil, we were able to link extraordinarily rich data on credit access with longitudinal employment records for the universe of formal firms from 2003-2014. Our findings thus far suggest that targeted credit supply expansions lead to increased entry of higher quality firms, particularly in the manufacturing sector and in regions where prior credit supply for SMEs was relatively limited.

### Background

With PEDL support and in collaboration with economists at the Central Bank in São Paulo, we rendered an enormous database of financial transactions, the Credit Information System Database (SCR), usable for academic research purposes. Moreover, through a partnership with the National Development Bank of Brazil (BNDES), we gained access to novel data on financial products originating at BNDES but intermediated throughout the Brazilian financial system. Among these products is an innovative scheme introduced in 2003 known as Cartão BNDES, which provides rotating credit lines for small and medium enterprises (SMEs) to purchase accredited inputs. We linked these novel data on credit transactions to the universe of formal sector employment records, which were obtained, prepared and harmonized with earlier rounds of data with financial support from PEDL.






Cartão BNDES is a rotating credit line for formal firms with tax ID numbers to make working capital input purchases from accredited suppliers. Firms apply at local branches of banks with approval to intermediate Cartão loans, the limit on which was BRL 50,000 from 2003 to 2008 and BRL 1 million thereafter. These input purchases are for eligible capital goods, the number of which varied over time but all of which must be made through an online web portal and have 60 percent national content. An example of these goods and the accredited suppliers can be seen in Figure 1 below. Cartão loans are typically smaller and on more favorable terms than other prevailing credit market opportunities for SMEs. According to data from BNDES and the Central Bank of Brazil described below, the median loan size of Cartão was BRL 19,108 compared to BRL 191,000 for other loans to SMEs. The typical annual interest rates on Cartão loans are 5-15% compared to 25-30% for other loans.

Credit access is pervasive in the Brazilian economy with 55 percent of all firms reporting any outstanding loans by 2012, an increase of around 12 percentage points relative to 2004, the first year of comprehensive reporting in the SCR. Meanwhile, over that same period, the share of firms with any indirect financing by BNDES grew from 1 percent to 10 percent. Most of that growth is explained by the expansion of Cartão BNDES, which reached nearly 8 percent of all formal sector firms by 2012. Although Cartão lending is a small part of the overall credit market for SMEs, it commands a significant share of the market in certain localities. Nationally, the share of Cartão loans in total SME loans grew from 0.1 percent

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in 2008 to 1.2 percent in 2013. However, by 2013, Cartão disbursements comprised more than 5 percent of total credit for SMEs in around 10 percent of municipalities with some reporting Cartão loans as much as one-fifth of the entire local credit market. Overall, the growth in Cartão lending constituted a dramatic increase in the scope of local credit market opportunities for SMEs.

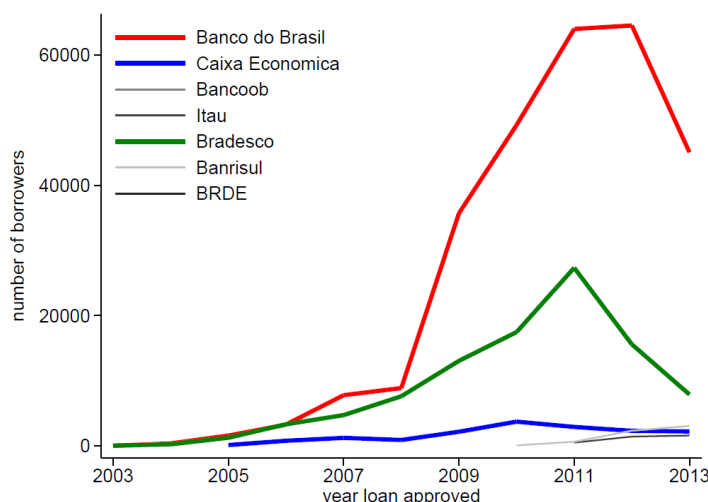
**Figure 1:** Example of Products Available for Purchase through the Cartão BNDES Web Portal

Catálogo de Produtos			
	<b>Produto</b> EMPILHADOR DE PEGAS	<b>Preço</b> Contactar Fornecedor	<b>Fabricante</b> ALBRECHT
	<b>Produto</b> Garfo para Empilhadeira	<b>Preço</b> Contactar Fornecedor	<b>Fabricante</b> Altmann
	<b>Produto</b> MÁQUINA DESPALETIZADORA	<b>Preço</b> Contactar Fornecedor	<b>Fabricante</b> ARRBAS MAQ ENG LTDA
	<b>Produto</b> MÁQUINA DESPALETIZADORA	<b>Preço</b> Contactar Fornecedor	<b>Fabricante</b> ARRBAS MAQ ENG LTDA
	<b>Produto</b> MÁQUINA DESPALETIZADORA SEMI-AUTOMÁTICA	<b>Preço</b> Contactar Fornecedor	<b>Fabricante</b> ARRBAS MAQ ENG LTDA

## Methods

We use this rich new data and policy context to investigate how credit supply expansions affect firm dynamics and growth. Our approach exploits historical variation in bank branch locations and lending networks coupled with a shock to the national supply of credit for SMEs associated with the Cartão BNDES lending program. This strategy of relating national shocks to local economic activity is widespread in labor economics beginning with Bartik (1991) and was introduced to the finance literature recently (see, e.g., Greenstone & Mas, 2012). Our key innovation is to leverage national credit supply expansions specific to SMEs whereas recent studies exploit generalized, negative credit supply shocks (e.g., Breza & Kinnan, 2016; Chodorow-Reich, 2014).

**Figure 2:** Staggered Expansion of Cartão BNDES Across Banks Over Time





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In particular, we exploit the fact that only certain banks could intermediate the program at certain points in time (see Figure 2 above). In a given year, BNDES allocates a certain amount of funding nationally for the Cartão program. The degree to which this national expansion in credit for SMEs affects credit availability and our outcomes of interest at the local municipality level will depend on the pre-existing presence of specific branches and specific intermediary relationships with BNDES. This allows us to isolate local Cartão credit supply expansions that are purged of changes in local demand for credit.

### Research findings

Our results suggest that local credit supply expansions associated with Cartão BNDES lead to greater churning of firms with both increased entry as well as increased exit. With deeper credit markets offering a wider array of financial products comes both greater opportunity and greater competition. The implied effects on entry and exit cancel out in aggregate, leading to no change in local employment over the short-run. However, by changing the composition of firms each period, the BNDES-induced credit supply shocks lead to changes in the quality of firms operating in the formal sector. Firms induced to enter are no smaller and perhaps even slightly larger in size and also tend to survive longer. Interestingly, these significant changes in local firm quality are most pronounced for manufacturing sector firms and in regions with low levels of credit per capita in the early 2000s. In fact, in regions with high levels of initial credit, the expansion of local credit supply leads to entry of more marginal firms in terms of size and survival.

Interestingly, the effects of the Cartão lending expansion depend on the response of other lenders in the local economy. A complementary empirical strategy allows us to isolate the impact of overall national BNDES-led credit expansions (i.e., Cartão and other indirect lending) on local credit supply. The resulting effects are therefore inclusive of the direct effects arising from BNDES-originated loans and the indirect effects arising from private lending responses to new sources of public credit. Using this strategy, we find significantly larger effect sizes. For example, the elasticity of firm entry with respect to total BNDES credit supply shocks is about six times larger than the corresponding elasticity for Cartão lending alone. This suggests that access to additional public financing from BNDES may allow local branches to expand their other credit lines in a manner conducive to further entry of higher quality firms.

Together, our findings suggest that novel sources of credit for SMEs can lead to important changes in the composition of firms. Prior work finds that reduction in entry costs often lead to entry of more marginal firms (Branstetter et al, 2013). Our study raises the possibility that credit may have different effects by drawing in productive entrepreneurs otherwise rationed out of the formal sector. These findings have important policy implications as Brazil and other countries continue exploring financial market reforms and innovations to increase formal sector activity.

### Potential policy implications

While we cannot isolate particular features of the Cartão program that resulted in our findings, we are able to draw a few relevant lessons for policymakers. First, our results should give pause to those concerned that a credit supply expansion will lead to entry of marginal firms otherwise unable to survive in more competitive environments. Moreover, our results are somewhat different from those in Kerr & Nanda (2009, 2010), which suggest that the expansion in credit associated with banking deregulation in the United States led to greater entry of small, short-lived firms. Perhaps the large size of the informal sector and scope for credit-induced formalization explain some of the difference. Second, the heterogeneous effects across sectors and regions point to the importance of targeting credit towards those potentially productive firms most plausibly subject to credit rationing. While this may not be practical in all settings, our results suggest that otherwise productive manufacturing sector firms in an emerging market like Brazil may have unmet demand for targeted credit schemes providing funding for particular input purchases.

These results are of interest to policymakers in Brazil as BNDES aims to expand its lending to SMEs from its current levels of 38 percent to around 50 percent. The Cartão program is a core feature of that



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expansion plans with current efforts to increase Cartão lending through the end of the year by 13.4 percent relative to 2016. Our findings will offer important input to these ongoing efforts at BNDES and related institutions.

### Moving Forward...

In terms of next steps, we aim to investigate (i) the extent to which Cartão lending increased formalization or allowed multi-establishment firms to expand operations, (ii) whether the effects of BNDES credit supply expansions are concentrated among borrowers alone or spill over to non-borrowers, and (ii) whether the relative growth in SME lending has effects on the firm size distribution via differential employment growth among small and large firms.