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The business cycle implications of bank discrimination in China☆

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ABSTRACT

Banks in China favor state-owned enterprises (SOEs) and discriminate against privately owned enterprises (POEs) in credit allocation. This paper explores the business cycle implications of bank discrimination in an estimated two-sector model. We model bank discrimination by assuming that real estate serves as collateral and that POEs have lower loan-to-value ratios than SOEs. We find that bank discrimination causes resource misallocation by crowding out the more productive POEs, which helps to quantitatively explain the volatility of SOE output share. We further find that housing demand booms and monetary easing drive up the real estate value, enhance the borrowing capacity of SOEs by more with bank discrimination, and thus lead to a rise in SOE output share to exacerbate resource misallocation.

1. Introduction

Since the early 1990s, the private sector in China has been growing fast while the share of state-owned enterprises (SOEs) has been shrinking. Despite the fast growth of privately owned enterprises (POEs), they are still subject to strong discrimination in credit markets. Empirical studies based on bank-firm data (Brandt and Li, 2003; Lu et al., 2005) show that private firms have a lower probability of obtaining bank loans and are subject to higher loan standards, after controlling for firm-level related factors. Since bank loans play a crucial role in channeling funds from savers to enterprises in China (about 60% in 2014), bank discrimination against private firms may have important implications for China's economy. Most of the current literature focuses on the impact of bank discrimination on long-term economic trends (Song et al., 2011, 2014). Our paper aims to examine the business cycle implications of bank discrimination. We are particularly interested in exploring the role of bank discrimination in driving fluctuations in SOE output share. Since the productivity in the SOE sector is lower than that in the POE sector (Hsieh and Song, 2015), a resource reallocation between these two sectors has significant impacts on aggregate productivity and social welfare.

We build a two-sector model that incorporates credit discrimination against the private sector. Both the SOE and POE sectors are assumed to be subject to collateral constraints tied to their real estate values, as in Kiyotaki and Moore (1997). The POEs suffer bank discrimination in that they have lower loan-to-value ratios than SOEs do. Model parameters are then calibrated or estimated via the Bayesian maximum likelihood method. The model well captures stylized facts about the volatilities and co-movements of aggregate variables. In particular, the model consistently predicts more volatile output in the SOE sector than in the POE sector, and shows procyclical SOE output share. On the basis of the estimated model, we quantitatively investigate the business cycle implications of bank discrimination by comparing simulated moments between the benchmark model and the model without bank discrimination. In particular, we find that the volatility of SOE output share with all shocks is reduced by 57% when bank discrimination is removed. This finding suggests that bank discrimination plays a significant role in amplifying the overall impacts of the various shocks on the fluctuations of SOE output share.

To demonstrate the business cycle implications of different borrowing constraints, we compare the impulse responses under models

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with and without bank discrimination. It turns out that the impact of bank discrimination depends on the specific economic shock. A positive housing demand shock or expansionary monetary policy boosts real estate prices and therefore the value of collaterals. In the benchmark model with bank discrimination, the impact of the financial accelerator mechanism is stronger in the sector with a higher loan-to-value ratio. SOEs with a higher loan-to-value ratio can borrow more and purchase more real estate than POEs can, thus increasing the output share of the SOEs. By contrast, in an alternative model without bank discrimination, a rise in real estate price enhances the borrowing capacity of enterprises in both sectors equally. Therefore, we observe the same responses to shock in sectoral borrowings, real estate investments and outputs. Consequently, the shock generates zero responses in SOE output share. Although the productivity shocks of SOEs and POEs cause a rise in real estate prices, they result in a reallocation of real estate from entrepreneurs to households. The downside effect of declining real estate holdings plays a dominant role in tightening credit constraints for entrepreneurs. Thus, the financial accelerator mechanism with the sectoral productivity shock is relatively weak. Positive SOE productivity shocks or negative POE productivity shocks lead to a rise in SOE output share. However, the impulse responses are only slightly different under models with various credit constraint assumptions.

Previous studies, such as Song et al. (2011, 2014), and Wang et al. (2017), assume that only POEs are faced with borrowing constraints and that SOEs are not subject to credit constraints at all. We follow to build an alternative model in which only POEs are subject to credit constraint, that is, the financial accelerator mechanism only applies to the private sector. However, the alternative model predicts that SOE output share will decline with a positive housing demand shock or an expansionary monetary policy shock, the exact opposite of the results derived from the benchmark model. We then test the hypothesis on SOE output share by conducting a VAR analysis based on the identification of monetary policy shocks. The VAR evidence demonstrates that a positive shock to the money supply generates a rise in SOE output share. This empirical finding validates the hypothesis derived from the benchmark model, in which SOEs enjoy higher loan-to-value ratios than POEs do, but contradicts the alternative model hypothesis, in which only POEs are subject to credit constraints.

Our results suggest that positive housing demand and expansionary monetary policy shocks, together with bank discrimination, could have a “crowding-out” effect on the private sector in China. These shocks drive up the value of collaterals, providing a disadvantage for POEs when competing against SOEs for borrowings. The relative share of the private sector thus declines, accompanied by significant implications for aggregate productivity. According to Hsieh and Song (2015), from 1998 to 2007, total factor productivity in the SOE sector was only around 65 percent of that in the POE sector. In addition, Chen et al. (forthcoming) show that private investment has the greatest effect on technological progress in China. The “crowding-out” of the private sector therefore leads to a decline in aggregate productivity and exacerbates resource misallocation. Our findings from the macroeconomic perspective are supported by micro level evidence from Chen et al. (2016), who use detailed land transaction data from Chinese listed firms to investigate the effects of real estate shocks on corporate investments and find a similar “crowding-out” effect between land-holding and non-land-holding firms. Furthermore, they show that land-holding firms are more likely to be SOEs, while non-land-holding firms are more likely to be POEs.

This paper is enlightened by a strand of literature that studies the models of agents facing differential credit constraints. For instance, Song et al. (2011) build a model in which SOEs are perfectly integrated into financial markets while POEs are credit constrained, arguing that the downsizing of financially integrated firms (SOEs) during economic transitions in China forces domestic savings to be invested abroad, because POEs are unable to absorb them fully due to credit constraints. Chang et al. (2015) depart from the traditional emphasis on SOEs versus POEs and focus on resource allocations between heavy and light industries. They argue that a preferential credit policy promoting heavy industries can well account for the economic transitions in China characterized by rising investment rates, declining labor shares and a growing foreign surplus. Coeurdacier et al. (2015) show that the interaction of economic growth and heterogeneous credit constraints can explain three prominent global trends: the private savings rate divergence between advanced and emerging economies, the large net capital outflows from emerging economies, and the sustained decline in global interest rates. Our paper differs from this strand of literature in that we focus on the short-term business cycle implications of heterogeneous credit constraints.

This paper also relates to a second strand of literature, which examines the contribution of the housing/land market on business cycle fluctuations. For example, Iacoviello and Neri (2010) explore the spillover effect of housing markets on the broader economy, using U.S. data in an estimated DSGE model. Liu et al. (2013) build a model that explains the observed positive co-movements among land prices, consumption and business investments. We follow these papers to highlight the value of real estate assets as borrowing collaterals but diverge from them by investigating interactions between real estate and bank discrimination in China.

The rest of the paper is organized as follows. Section 2 provides a brief introduction to the institutional background of bank discrimination in China. Section 3 presents the model and Section 4 utilizes the estimated model to examine the business cycle implications of bank discrimination. Section 5 conducts a VAR analysis to test the derived hypothesis. The final section concludes.

2. Institutional background

Before 1978, private sector development was nearly completely suppressed in China. It was not until the country adopted a series of reform and opening-up policies in the late 1970s that the private sector began to emerge. In the early stages, POEs were subject to heavy restrictions; before 1988, for example, they could not hire more than seven workers. Later, during the transition, POEs gained increasing legitimacy. Constitutional amendments in 1982 established the private sector as a legitimate component of the socialist economy, complementing the state-owned economy. A change in official attitudes toward the sector was signaled at the 15th Party Congress in 1997, when the Party changed the position of the private economy from a “complement to the state-owned economy” to an “important component of the socialist market economy”.

In addition to newly established private enterprises, the privatization of collectively owned enterprises and SOEs also fueled the boom of the private sector. Throughout the 1980s and early 1990s, many township and village enterprises (collectively owned by villagers) were privatized (Brandt and Li, 2003; Li and Rozelle, 2003). More small and medium-sized SOEs were privatized, and unprofitable state enterprises were weeded out under the 1998 policy of “grasping the big and letting go of the small” (Hsieh and Song, 2015).

The private sector has witnessed rapid growth in the past two decades. As shown in Fig. 1, the private sector share of industrial output increased from 51.8% in 1992 to 65.3% in 2012. Meanwhile, the private sector share of employment increased from 39% to 81.6% over the same period.[1]

Despite the blossoming of the private sector, the literature well documents that POEs still face more difficulties in obtaining bank loans

[1] Holz (2014) constructed industrial output series for both the economy as a whole and the public sector. We calculate private sector share as the ratio of non-public sector output to that of the entire economy. The data on employment of enterprises with various kinds of ownership are obtained from the National Bureau of Statistics (NBS). We calculate the private sector employment share as (Total employment - SOEs’ employment)/Total employment.