The Role of Bank-based Financial Structure in Technological Innovation

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Abstract

The whole process of technological innovation and its large-scale promotion and application require a large amount of research and development funds. However, there is an urgent need for enterprises with sustainable development through technological innovation to have insufficient internal funds, and they can only rely on external financing to support enterprises' innovative projects. In China's financing system, bank-based credit financing accounts for a large proportion. The article uses the panel data of the provinces in China during the sample survey period (2008-2017), and uses static panel analysis to empirically study the relationship between the dominant financial structure of the Bank of China and technological innovation. The research results show that the bank-led financial structure is more conducive to the overall Technological innovation and independent innovation.

Keywords

Banks, Financial Structure, Technological Innovation.

1. Introduction

Technological innovation is the driving force for the sustainable development of a country's economy. Technological innovation from research and development, experimentation, commercialization to industrialization and its large-scale promotion and application require a large amount of research and development funds. The development of the banking industry in China has been relatively stable and plays an indelible role in promoting the development of the national economy. The scale of bank loans in China is far greater than the amount of stock financing, and it is more obvious in supporting the technological innovation effect of enterprises.

2. Theoretical Analysis

2.1 Analysis of Financing Function of Banking Industry

From the analysis of the financing function of the banking industry, the two most basic businesses in the business process of commercial banks are to absorb deposits and issue loans. Enterprises must meet certain conditions in order to borrow through the banking sector. Interest is the most important cost of bank financing. The interest rate will directly affect the economic profit of the enterprise. If the enterprise wants to obtain higher economic profits, it will lower the interest cost. In China, banking financing accounts for about 80% of the total financing of the society. From the supply side of the funds, especially the state-owned banks have a large amount of loans that can be issued, which may result in an oligarchic situation. In theory, banks have a sound financing function, but in terms of China's specific situation, the bank's financing function needs further improvement. Although the availability of bank financing is relatively high, bank loans are limited by the capital structure of the enterprise or the financial duo, that is, the bank cannot finance high-debt enterprises, and with the gradual increase of the debt ratio of the enterprise, the bank borrows from the enterprise. Mortgage guarantee conditions are also gradually stricter.

2.2 Analysis of Banking Risk Management Function

From the perspective of banking risk management functions, the biggest characteristic of bank intermediaries in risk management is the internalization of risks. In the process of lending to banks, the liquidity risk of borrowers is automatically transferred to the banks themselves. The banking industry-led financial industry structure adopts a sharing mechanism when dealing with risks. Banks provide enterprises with the funds needed for innovation, and they also bear the risks brought by innovation together with enterprises. For investors, the risk has not been transferred to themselves. The first principle of bank management is to be robust and not suitable for providing financial access to high-yield, high-risk companies. It is this sharing mechanism and the principle of sound management that requires banks to adopt a very cautious attitude to audit the qualifications of enterprises when they need a lot of money for technological innovation.

2.3 Intermediary Information Processing Function

From the perspective of the information processing function of bank intermediaries, in the process of capital lending, banks use professional technology to help investors in the early stage of screening and post-supervision supervision, so banks can screen out the strength to carry out innovation activities and through innovation. A company that enhances its sustainable development capabilities. And banks and enterprises often establish a long-term cooperative relationship, and long-term cooperation will better solve the problem of information asymmetry.

Therefore, this paper proposes a theoretical hypothesis that the financial industry structure led by bank intermediation is conducive to the improvement of technological innovation level.

3. Model setting

This paper builds a model of the impact of bank-led financial structures on technological innovation. In order to make the empirical results reliable, the parameter estimation is effective. This paper uses panel data for regression analysis. When building the model, refer to the method of Beck and Levine (2002) to establish the following equation:

$$y_{it} = \mathrm{c} + \beta x_{it} + \gamma \mathrm{z}_{\mathrm{it}} + \sigma_i + \mu_{it} \tag{1}$$

Table 1 Related Variable Description

Index	Symbol	Definition
Technological Innovation	PAT	Number of patent applications per 10,000 people
Independent Innovation	ZC	Number of invention licenses per 10,000 people
Imitation Innovation	WG	The sum of utility model and design authorization per 10,000 people
Financial Structure	JG2	Year-end loan balance of financial institutions / fund-raising amount in various regions
Financial Technology Grant	GC	Financial technology grants by region / total local fiscal expenditure
Foreign Direct Investment	FDI	Foreign direct investment/GDP
R&D	RD	R&D capital investment / national funding support
Scientific Manpower	TH	R&D personnel full-time equivalent / national full amount at the time

4. Panel Regression Analysis and Empirical Results

Table 2 Static Panel Regression Analysis

Variable	Innovation	Independent Innovation	Imitation Innovation
	(1)	(2)	(3)
JG	0.2054** （10.2）	0.2438*** (9.69)	0.2153*** (10.01)

GC	0.0412 (0.64)	-0.0519 (-0.46)	0.0479 (0.78)
TH	0.0201** (2.55)	0.0285*** (3.32)	0.02517** (2.71)
FDI	-0.16782* (-2.1)	-0.2781*** (-4.17)	-0.1247 (-1.58)
RD	1.3541*** (7.57)	1.5614*** (8.64)	1.3781*** (7.21)
Hausman	0.0000	0.0000	0.0000
R^2 :within	0.6874	0.7253	0.6471
Observations	360	360	360

5. Conclusion and Suggestion

The coefficient of estimation corresponding to the ratio of bank intermediation to financial market is negative in the equation and is significantly correlated. Consistent with the previous theoretical assumptions, the bank-led financial structure can promote the level of technological innovation. This shows that although in China's financial structure, banking intermediaries still dominate.

From the experience of financial marketization reform in developed countries, the proportion of direct financing scale to total social financing scale has gradually increased in the process of reform. In the context of current financial repression and financial deepening, China should seize the opportunity of reform, promote the further development of multi-level capital markets, and achieve rational allocation of financial resources. First, actively guide the healthy and orderly development of the stock market, improve the enthusiasm of investors, play the effectiveness of idle funds, and expand the scale of stock financing and securities lending. The second is to accelerate the development of the bond market. While vigorously promoting the development of corporate bonds, it promotes the development of local government bonds, allows the state to participate in the market, and enhances the enthusiasm and efficiency of local governments. The third is to promote the development of private equity funds. Compared with public fundraising, it can stimulate the innovation vitality of enterprises and promote the allocation of various resources in enterprise R&D and innovation. Fourth, actively promote asset securitization, increase the construction of the New Third Board, small and medium-sized board, and the ChiNext, and inject new vitality and vitality into the development of China's financial market. The fourth is to promote the innovation of various financial instruments. A variety of financial instruments are available for investors to choose, which is conducive to the risk of decentralizing the financial system.

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