Формирование рынка P2P-кредитования началось после появления в 2005 г. британской интернет-площадки Zopa, в 2006 г. — американской Prosper.

Лидером мирового рынка является американская компания Lending Club. Она открылась в 2007 г. и, по данным на I квартал 2019 г., предоставила финансирование на 42 млрд дол. США. В 2014 г. компания вышла на IPO и была оценена в 5,4 млрд дол. США.

По оценкам Мировой финансовой корпорации (International Finance Corporation — IFC), потенциальный спрос малого и среднего бизнеса в Республике Беларусь на кредиты составляет более 18 млрд дол. США. Это говорит о том, что масштабы кредитования можно увеличить по сравнению с текущими более чем в 5 раз.

Подтверждается актуальность развития данного направления, что свидетельствует о потенциале для дальнейшего роста альтернативных финансов в Республике Беларусь.

Для этого необходима адаптация национального законодательства и перевод рынка краудлендингового финансирования Республики Беларусь в онлайн-режим.

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MEASUREMENT AND EMPIRICAL STUDY OF SPATIAL SPILLOVER EFFECTS OF CHINESE MANUFACTURING INDUSTRY

1. Introduction

Spillover Effect is a common economic phenomenon, it means that a certain type of economic activities undertaken by an economic unit will not only have an effect on the economic unit itself, but also on groups and even society outside the unit. Spillover effects are “externalities” issues discussed in economics, if the effects of spillovers are positive and good, the so-called external economy. In the study of industrial economic issues, spillover effects mainly refer to inter-industry spillover effects and space spillover effects. The former mainly occurs between the upstream and downstream of the industrial chain, and the latter is between different areas of industrial development. In essence, the general connection between industries and regions caused by economic activities makes the existence of spillover effects inevitable.

2. Model Specification

Constructing a Spatial Spillover Model for China’s Manufacturing Industry based on the General Ideas of the Spatial Regression Model. According to classical economic theory, output can be represented by a simple C-D production function:

$$Q_{it} = AK_{it}^{\alpha}L_{it}^{\beta}. \tag{1}$$

Where Q is output quantity, K is capital input quantity, L is labor input quantity, A is technical level. The subscripts and denote the observation area and observation time respectively.

Due to the economic spatial dependence, the input factors of adjacent regions may also affect the output of the region, that is, there is a spatial spillover phenomenon. The essence of the spatial spillover effect is that economic factors interact in different areas (ie, spaces). Based on this, this paper will expand the C-D production function under the framework of considering the space effect, and formula (2) can be obtained:

$$Q_{it} = \Lambda K_{it}^{\eta+\alpha}K_{wit}^{\theta}L_{it}^{\beta}T_{it}^{\gamma}R_{it}^{\nu}R_{wit}^{\iota}P_{it}^{\lambda}P_{wit}^{\xi}. \tag{2}$$

Where Λ is constant parameter, the subscripts w is adjacent area, R is technological innovation capability, P is the professional skills of the employees, and T is the transportation conditions. In formula (2), parameters such as $\theta, \delta, \iota, \xi$ measure the influence of factors in adjacent areas on the output of the central area, so this model can be regarded as a model of China's manufacturing space spillover. In practical applications, formula (2) is linearized and a random error term is added to construct a linear econometric model. As shown in formula (3).

$$\log\log(Q_{it}) = \alpha_0 + \rho W \log\log(Q_{it}) + \alpha_1 \log\log(K_{it}) + \alpha_2 W \log\log(K_{it}) + \alpha_3 \log\log(L_{it}) + \alpha_4 \log\log(R_{it}) + \\ + \alpha_5 W \log\log(R_{it}) + \alpha_6 \log\log(P_{it}) + \alpha_7 W \log\log(P_{it}) + \alpha_8 \log\log(T_{it}) + \alpha_9 W \log\log(T_{it}) + \varepsilon_{it}. \quad (3)$$

Where is first-order spatial adjacency matrix, is model parameter, is model random term.

3. The Measurement Method of Spatial Spillover Effect

Here we first analyze the regression coefficients of the space spillover model formula (3). The model described in formula (3) is essentially a kind of spatial Durbin model (SDM), without loss of generality, which can be written as the matrix form as follows:

$$(I_n - \rho W) y = X\beta + WX\theta + \varepsilon$$

Where W is spatial adjacency matrix, β, θ is parameter vector, ε is error vector. The explained variable y and the explanatory variable X represented by a matrix here can correspond to the variables in logarithmic form in formula (3), that is, formula (3) can be analyzed according to this idea. The SDM model can be further rewritten as

$$y = \sum_{r=1}^{k} S_r(W) x_r + (I_n - \rho W)^{-1} \varepsilon,$$

where

$$S_r(W) = (I_n - \rho W)^{-1} (I_n \beta + W\theta).$$

Considering that matrix can be written approximately as follows:

$$(I_n - \rho W)^{-1} \approx \text{In} + \rho W + \rho^2 W^2 + \ldots + \rho^q W^q.$$

So that matrix can be written as:

$$S_r(W) \approx (I_n + \rho W + \rho^2 W^2 + \ldots + \rho^q W^q)\beta + (I_n + \rho W + \rho^2 W^2 + \ldots + \rho^q W^q) W\theta = \\ = (I_n \beta + \rho W \beta + \rho^2 W^2 \beta + \ldots + \rho^q W^q \beta) + (W\theta + \rho W^2\theta + \rho^2 W^3\theta + \ldots + \rho^q W^{q+1}\theta)$$

Under this expression $S_r(W)$ of the matrix, it is easy to measure *ANDE*, *AYDE* and *AIE*, and at the same time, the analysis of the implementation path of the space spillover effect according to the order of the spatial adjacency matrix W can be further analyzed and shown. In other words, the influence effect of explanatory variables on explained variables can be decomposed into the forms of spatial adjacent of different orders, and then the size of spatial spillover effect under different influence paths can be seen. For example, $\rho W\beta$ is a direct spillover effect that is conducted through a first-order adjacent region, and $\rho W^2\theta$ is an indirect spillover effect that is transmitted to a central region after an adjacent region has experienced another adjacent region. Obviously, with the exception of $I_n\beta$, all terms are spatial spillover effects. $I_n\beta$ is the direct influence of explanatory variables on the explanatory variables in the observation area, and is called . To show the changing trajectory of spatial spillover effect in different regions, this paper decomposes the spatial spillover effects under first-order adjacent (W), second-order adjacent (W^2), and third-order adjacent (W^3) to show and analyze the changes of spatial spillover effects under different spatial distances.

4. Empirical Analysis

The data is divided into two groups according to different statistical caliber, one group is the panel data from 2008 to 2010, and the other group is the panel data from 2011 to 2012. This paper will build two sets of spatial panel data models based on the above models, so as to observe and compare the changes of spatial spillover effects of Chinese manufacturing industry during the global financial crisis (2008–2010) and the post-crisis era (2011–2012). Using two sets of sample data for parameter estimation of model formula (3), it is found through the information of BSJK test and BSK test that both sets of data support the selection of individual effect and random effect models, thereby obtaining model parameter estimation results. The decomposition results of space spillover effects calculated on this basis are shown in the Table.

Spatial Effect Decomposition of Capital Input and Employee Skills

Variate (Model)	Degree	Average Direct Effect (*ADE*)		One-way Spatial Spillover Effect (*AIE*)		Total space spillover effect (*AYDE* + *AIE*)
		Direct Influence	Spatial Circuitous Spillover Effect (*AYDE*)	Adjacent Spillover	Complex Path Spillover	
K(2008–2010	W^0	0.6440329	—	—	—	—
	W^1	—	0.023117561	0.2182036	—	0.241321161
	W^2	—	0.000829805	—	0.007832418	0.008662223
	W^3	—	2.97858E-05	—	0.000281145	0.000310931
K(2011–2012)	W^0	0.50961943	—	—	—	—
	W^1	—	0.000392983	0.26293627	—	0.263329253
	W^2	—	3.03041E-07	—	0.000202758	0.000203061
	W^3	—	2.33684E-10	—	1.56353E-07	1.56587E-07
P(2008–2010)	W^0	0.0200078	—	—	—	—
	W^1	—	0.00071818	0.1365047	—	0.13722288
	W^2	—	2.57791E-05	—	0.004899836	0.004925615
	W^3	—	9.2534E-07	—	0.00017588	0.000176805

At the method level, this decomposition idea is designed on the basis of the analysis and calculation of the matrix $S_r(W)$, and the contents of the decomposition of the spatial spillover effect shown by the matrix calculation process are also relatively intuitive and easy to understand. From the perspective of the decomposition path, this new method of space spillover decomposition is based on the decomposition of the first layer, and then the decomposition of the space spillover effect of the second layer, that is, the overall average effect is decomposed into the average direct effect and the average indirect effect. Then, the secondary direct decomposition of the average direct effect and the average indirect effect are performed separately, and the space spillover effect components are further constructed from the results of the secondary decomposition.

5. Conclusion

Based on the c-d production function, the spatial spillover effect model of Chinese manufacturing inputs is designed and estimated. The space spillover effect of manufacturing industry was further decomposed, and further analysis and research were done. The following conclusions can be drawn from the full text. At the element level, the first is that the spatial spillover effect of China's manufacturing industry is mainly reflected in capital input factors, and the spatial spillover effect of employee skills factors on the output of the manufacturing industry also exists, which is obviously weakened in the post-financial crisis period; the second is that the spatial spillover effect of R&D investment in road, railway and other infrastructure elements on manufacturing output needs to be further expanded. At the spatial level, the first is that the spatial spillover effect of China's manufacturing industry mainly exists between adjacent regions (bordering regions), while the spatial spillover effect of non-directly adjacent regions is not obvious; the second is that the spatial spillover effect of the manufacturing industry is mainly reflected by spillover between adjacent areas, that is, adjacent spillover, detour spillover effect, and spillover effect of more complex paths are relatively weak.