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# How Financial Agglomeration Effects on Regional Economic Growth

**Ning Zhang**

Department of Management, Minzu University of China, Beijing, China

Email: zhangningmuc@163.com

**Abstract** –Since from 20th century 70s，with the economic integration and financial globalization, international capital flows accelerated and the reorganization of international financial industry, caused financial activities and financial institutions aggregated in the financial center. Modem market economy has proved that there exists very close interaction between financial development and economic development. And China's regional economic development differences are depends on the regional differences in financial development in a large part. Although China has established a relatively sound financial system, but also formed a certain scale of financial concentration regions, but there are also many problems need to be solved, like the layout of financial resources and financial center construction, etc. The study on the finance agglomeration has great actual significance for the development of China regional economic and finance. Like the study on the characteristics of financial concentration in China, the impact to regional economic development, promoting regional financial healthy development and the strategies of financial reforms. And these studies have great theoretical significance to financial services industrial cluster theory research.

**Keywords** –Finance Agglomeration; Finance Concentration; Regional Economy; Spatial correlation

## 1. Introduction

Since the 1960's, the population dimensions and economic gross grows continuously, as the earth's natural resources decreased and the human environment deteriorated, environmental problem get more and more attention. Dasgupta and Heal using CES production function, they considered the non-renewable resources as raw materials and put them into the production function to study the economic growth. Finance is the core factor of the economy growth, the history of economic development shows that: the role of finance has been growing in the past five hundred years to promote economic development, especially in the highly developed modern economy; finance has played an irreplaceable role. The first scholar who comprehensive studies the relationship between finance and economy growth is Bagehot, he found that the financial system plays a key role by providing large capital during the British industrial revolution. Schumpeter argue that financial intermediary services is has crucial effect to economy growth, bank promoting technical innovation by provide funds to the most competitive entrepreneurs, and finally promote the economic growth. Gurley and Shaw developed the Schumpeter's point of view; they think that financial development is a necessary condition for economic growth. Patrick first put forward the causal relationship between finance and economic growth; he thinks three is a two-way causal relationship between finance and economic growth.

On the basis of theoretical analysis and empirical tests，the paper strategic vision of multi—level regional financial center Construction in China combined with situation of current international financial development trends and Chinese economic and financial development. The strategic vision includes strategic positioning of the eastern, central and western parts' financial concentration and how to achieve inter-regional financial cooperation.

## 2. Economy growth model

We analyze a closed economy which has five sectors: the final product sector, human capital sector, R&D sector, intermediate products sector and energy production sector. Economic operating mechanism is that: Human capital sector develop human capital, were used for the final product sector, R&D department and human capital sector; R&D sector use human capital and existing technology to develop new technologies; intermediate products sector use the material capital and technology which provided by R&D departments to product a series of durable intermediate products; energy production departments engaged in product renewable energy ; the final product sector use human capital,

intermediate products and renewable energy sources to produce the final product. The final product sector produces the final product and exhaust carbon dioxide emissions at the same time. Economic operation mechanism can be shown as figure 1. According to the meaning of low carbon economy growth, it requires non-renewable energy growth rate was negative, while the carbon dioxide emissions growth rate is also negative. Because we should gradually reduce the non-renewable energy consumption during the production process, otherwise it can not solve the carbon dioxide emissions problem fundamentally, also cannot achieve a low carbon economy growth

### 2.1. The final product sector

We presume the final product production function is a D-S function, and introduce the non-renewable energy as a factor into the production function, therefore, the production function of final product sector is:

$$Y = H_r^{a_1} \int_0^A X_i^{a_2} di E^{a_3}$$

In formula 1, 0<a1<1; 0<a2<1; 0<a2<1, and a1 +a2 +a3=l. This means that the production function has constant returns to scale. Hr represent human capital which has been put into final product sector, Y represent per capita output, A is the type number of intermediate products, represent the stock of technical knowledge. We presume A is continuous; Xi is the quantity of intermediate product i; E is non-renewable energy that put into final production department.

### 2. 2.Human capital sector

Human capital mainly depends on the production efficiency of human capital and input quantity, therefore, the human capital production function:

$$\dot{H} = \delta_H \left(H - H_r - H_A\right)$$

### 2.3. R&D sector

Assume that the technology in R&D sector is non-exclusive; so, technology innovation mainly depends on the Department's human capital investment and the existing technical stock. The R&D sector production function:

$$\dot{A} = \delta_A H_A A$$

A represent the technical stock in economy; δA represent possibility of technological innovation, the greater the δA is the higher the possibility of technological innovation; H represent the human capital investment.

### 2.4. Intermediate products sector

In the intermediate products sector, once the new varieties of products or design were invented by the R&D department, one unit of the intermediate product Xi (i0, A) just consumed 1 units of material capital K, therefore, the capital amount can be expressed as:

$$K = \int_0^A X_i di$$

According to the final product sector production function, the entire intermediate product Xi is asymmetrical, and the input requirement is same. For ∀i∈[0,A], we can get Xi= X=K⁄A. Put this into the final product production function, we can get:

$$Y = H_Y^{a_1} A x^{a_2} E^{a_3} = H_Y^{a_1} A^{1-a_2} K^{a_2} E^{a_3}$$

We presume there is no capital depreciation, therefore, the increase of capital stock value equals to the total output subtracts consumption, and thus the material capital accumulation equation is:

$$\dot{K} = Y - C$$

### 2.5. Energy production sector

We assume S is the stock of non-renewable; E is energy into flow the final product production process. We assume existing energy are non-renewable, the initial stock of energy is S0, and then the stock of energy is:

$$S = S_0 - \int_0^1 E(v) dv$$

Based on the derivation of time t, we can get consumption changes of non-renewable energy:

$$\dot{S} = -E$$

## 3. Empirical Results

We make the empirical test of the relationship between the financial factors and the energy consumption. I use the annual data of Loans of financial institutions (DK); the dimension is billion yuan RMB. I chose total energy consumption E as energy variable, sample data from the years 1978-2008, data from 2009 “China Statistical Yearbook” and “new China fifty-five years of statistic information.” In order to solve the nonlinear problem, I take natural logarithms of DK and E, as InDK and lnE. In this paper, I ues the ADF unit root test method to test the smoothness of each variable; the result is shown as table 1.

**Table 1.** The ADF unit root test results of InDK and lnE

| ***variables*** | ***LnDK*** | ***LnE*** | ***dlnGDp*** | ***dLnE*** |
|---|---|---|---|---|
| ADF Test Statistic | -1.7714 | 0.6275 | -4.9746 | -2.9583 |
| Inspection type(c,t,k) | (c,0,0) | (c,0,0) | (c,0,1) | (c,0,1) |
| 10% Critical Value | -2.6299 | -2.6251 | -2.6299 | -2.6326 |
| Stationary or not | NO | NO | YES | YES |

In order to study the cointegration relation between lnDK and lnE, I made a Johansen Cointegration Test, the result stated in table 2.According to the results from table 2, we can get that InDK and lnE has a strong co integration relationship at 5% significance level.

**Table 2.** The co-integration test between lnDK and lnE

| *eigenvalue* | *Trace test* | *5% Critical Value* | *Hypothesized No of CE(s)* |
|---|---|---|---|
| 0.3115 | 0.3912 | 19.6344 | None* |
| 0.2629 | 0.0075 | 8.8097 | At most 1* |

According to the test results from table 2, I get the normalized co-integrating equations for LnE in China:

LnE=7.5997+0.4352LnDK+u

t= (52.6833) (28.1916)

## 4. Conclusion

This paper focuses on the mechanism that how financial factors promote low-carbon economy growth. First of all, I use the endogenous economic growth model to analyze the low-carbon economic growth, from the results we can get that: if the technical innovation has a sufficiently high efficiency, economy can overcome the constraint of non-renewable energy consumption, achieve low-carbon economy growth. There need to explain that through the analysis of the model we can get that technology innovation can promote low-carbon economic growth, and the low-carbon economy growth is a necessary condition to the low carbon economy development. Therefore, technological innovation is the fundamental way to solve the problems of environment and resources, and also the essence to develop low-carbon economy. China should better use financial factors to promote the low-carbon economic growth and change the economic growth model.

Firstly, the paper proposed the significance and practical motives of this research according the development of China's financial status. The paper gives the concentration of research papers research ideas main content and technical line based on the research summary. Then paper summarized the inclusion of financial geography. spatial economics and financial research of industrial economics spatial concentration. The paper analyzed the characteristics and causation of finance agglomeration from the point of view of processes and phenomena of financial concentration. The paper analyzed operational mechanism of finance agglomeration combined with the characteristics of the financial industry. Then the paper analyzed operational mechanism of the effect from finance agglomeration regional economic growth. On the basis of the theoretical analysis, papers did the econometric model analysis relation between financial agglomeration and regional economic growth.

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## Vitae

Ning Zhang was born in 1988. He is studying for his master degree now in department of management, Minzu University of China. His research interest includes monetary policy, bank liquidity risk, business cycle and macroeconomic.