Research on Demand and Training of Shanghai Financial Service Outsourcing Talent

Longfei Liu, Ying Li, Lijun Liang
Shanghai University of Engineering Science
Room 7018, Building No.18, Lane 1000
Wenhui Road, Songjiang District, Shanghai, China

Abstract

As Chinese financial center and one of the demonstration cities of service outsourcing, the level of financial service outsourcing development of Shanghai is the nation's leading status. On Sep.30, 2013, China (Shanghai) Pilot Free Trade Zone is built. The financial service industry will be opened fully in Shanghai. The volume of business about financial service outsourcing will rise sharply. As a result, the financial institutions will have a great demand for financial talents. This paper forecast and analyzes the demand of financial service outsourcing in Shanghai with Grey Model (1, 1), and puts forward training measures about Shanghai financial service outsourcing talents.

Keywords: Financial Service Outsourcing, Talent, Grey Model (1, 1)

The economic transformation and upgrading in China is in the key period. With the advancement of China's financial reform and enhance of the financial services opening degree, the financial service outsourcing has been rapid development. On Sep.30, 2013, China (Shanghai) Pilot Free Trade Zone is built. Negative list creates a highly open investment environment in market access, national treatment of foreign capital, business management and investment services, etc. Especially in the field of financial services, negative list expands the offshore service outsourcing business and provides a golden opportunity for the innovation and development off financial service outsourcing. The financial service industry will be opened fully in Shanghai. The volume of business about financial service outsourcing will rise sharply. As a result, the financial institutions will have a great demand for financial talents.

1. Development Status of Shanghai Financial Service Outsourcing

China's economy is entering the critical period of transformation of the mode of production. Structural adjustment is the main direction of transformation of the mode of production. As the economic artery in China, structural adjustment of the financial industry is imperative. This requires financial institutions to focus on the main business and carry out sophisticated operation. For the non-main business, financial institutions should reduce cost, improve efficiency and enhance the core competence through the way of outsourcing. The financial service outsourcing is the important content of structural adjustment of the financial industry. As one of largest vertical industry in the service outsourcing, the financial service outsourcing is extending of the financial industry value chain.

As Chinese financial center and one of the demonstration cities of service outsourcing, the level of financial service outsourcing development of Shanghai is the nation's leading status. In Mar.2003, Shanghai built the financial information service base—Shanghai Bankcard Industry Park. Shanghai Bankcard Industry Park is the first financial information services agglomeration which mainly services to financial background service department. In 2012, the amount of service outsourcing contract is $51.988 billion, and the amount of offshore service outsourcing contract is $3.267 billion. In 21 of service outsourcing demonstration city in China, Shanghai has been ranked first for three consecutive years. In 2012, Shanghai financial industry added value 245.036 billion, an increase of 12.6% over the previous year and increased 136 financial institutions. Among them, 59 monetary financial services, 43 capital market services and 14 insurance industries. By the end of 2012, Shanghai increased 1124 financial institutions. Among them, 510 monetary financial services, 193 capital market services and 347 insurance industries. As shown in Table 1.

Table 1: Number of Shanghai Financial Institution from 2009 to 2012

Year \ Institution	2009	2010	2011	2012
Banking	133	155	160	510
Securities	98	138	149	193
Insurance	307	320	333	347
Foreign Financial Institution	170	173	173	208
Total	794	910	1048	1124

By the end of 2012, Shanghai increased 208 foreign financial institutions and 210 representative offices of foreign financial institutions. At present, the business of financial service outsourcing in Shanghai mainly include treasury and safety, ATM, bankcard business, vouchers and bills, IT business, legal affairs and human resources. As shown in Table 2.

Table 2: Business of Financial Service Outsourcing in Shanghai

Outsourcing Business	Business Content
Treasury and Safety	Mainly includes protection of treasury, cash escort, security service etc
ATM	Mainly includes self-service terminal service, non-cash management of self-service machine etc
Bankcard Business	Mainly includes production of bankcard, bill printing and acquiring business, POS service, supply of integral gift etc
Vouchers and Bills	Mainly includes accounting voucher scanning, internal notes passing, bills data entry, bill printing etc
IT Business	Mainly includes development and maintenance of information technology systems, telephone banking, data processing center business etc
Legal Affairs	Mainly includes debt collection, non-performing loan collection, pledged goods assessment etc
Human Resources	Mainly includes pay five social insurance and one housing fund for remote employees in the work of the local

2. Demand Forecast of Shanghai Financial Service Outsourcing Talents

Finance is the artery of economy and the core of modern economy. Te development of the financial industry has tremendous simulative effect to local economy. The change of financial talents total amount reflects the development trend of financial industry in a region. The demand forecast of financial service outsourcing talents has a certain reference value for the development of a local financial industry. [1]This paper selects the basic data of the number of financial industry employees in Shanghai from 2008 to 2012, uses the grey system theory, establishes Grey Model (1,1) and forecasts the demand of financial service outsourcing talents in Shanghai. The forecasting process is as follows.

2.1 Inspection and Processing of Data

The number of financial industry employees in Shanghai from 2008 to 2012 is shown in Table 3.

Table 3: Number of Financial Industry Employees in Shanghai from 2008 to 2012

Number	1	2	3	4	5
Year	2008	2009	2010	2011	2012
Number of People	231900	221100	241100	284100	300500

Original Sequence $x^{(0)}$=(231900,221100,241100,284100,300500). Inspect the data of the original sequence. As shown in Table 4. The class ratio of the sequence is shown as follows.

$$\lambda(k) = \frac{x^{(0)}(k-1)}{x^{(0)}(k)} \quad (\text{k=2,3,…n}) \qquad (1)$$

If all of the class ratio λ (k) are in $X = (e^{\frac{-2}{n+1}}, e^{\frac{2}{n+1}})$, sequence x $^{(0)}$ can be as Grey Model (1, 1) and forecasts the data. On the contrary, it should select the appropriate constants to exchange. $y^{(0)}(k)=x^{(0)}(k)+c(k=1,2,3…n)$. Sequence $y^{(0)}=\{ y^{(0)}(1),y^{(0)}(2)…y^{(0)}(n)$.

$$\lambda_y(k) = \frac{y^{(0)}(k-1)}{y^{(0)}(k)} \in X \quad (\text{k=2,3…n})$$

Table 4: Inspection Results of the Original Data

Item	k=2	k=3	k=4	k=5
λ(k)	1.05	0.92	0.85	0.95
X	(0.51,1.95)	(0.61,1.65)	(0.67,1.49)	(0.71,1.40)

By table 4, all of the class ratio λ (k) are in $X = (e^{\frac{-2}{n+1}}, e^{\frac{2}{n+1}})$. As a result, sequence x $^{(0)}$ can be as Grey Model (1, 1) and forecasts the data.

2.2 Establish Grey Model GM (1, 1)

Original Sequence x $^{(0)}$ = (231900, 221100, 241100, 284100, 300500)
Generating Sequence x $^{(1)}$ = (231900, 453000, 694100, 978200, 1278700)
According to the following formula.

$$\alpha = \begin{pmatrix} a \\ \mu \end{pmatrix} = (B^T B)^{-1} B^T Y_n \qquad (2)$$

$$B = \begin{bmatrix} -\frac{1}{2}[X^{(1)}(1) + X^{(1)}(2)] & 1 \\ -\frac{1}{2}[X^{(1)}(2) + X^{(1)}(3)] & 1 \\ … & … \\ -\frac{1}{2}[X^{(1)}(n-1) + X^{(1)}(n)] & 1 \end{bmatrix}, \quad Y_n = \begin{bmatrix} X^{(0)}(2) \\ X^{(0)}(3) \\ … \\ X^{(0)}(n) \end{bmatrix}$$ calculate and obtain, $\alpha = \begin{bmatrix} -0.107 \\ 184741 \end{bmatrix}$,

$a = -0.107, u = 184741$. Put the value of a, u into $\dfrac{dX^{(1)}}{dt} + aX^{(1)} = u$. Differential equation of Grey Model

(1, 1) is shown as follows. $\dfrac{dX^{(1)}}{dt} - 0.107 X^{(1)} = 184741$。

Grey Model (1, 1) about the demand of Shanghai financial service outsourcing talents is shown as follows.

$$\hat{x}^{(1)}(k+1) = [x^{(0)}(0) - \frac{u}{a}]e^{-\hat{a}k} + \frac{u}{a} = 1960639 e^{0.107k} - 1728739$$

2.3 Analyze and Inspect Model

The formula of absolute error is shown as follow.

$$\varepsilon^{(0)}(k) = \left| x^{(0)}(k) - \hat{x}^{(0)}(k) \right| \qquad (3)$$

The formula of relative error is shown as follow.

$$q(k) = \frac{\varepsilon^{(0)}(k)}{x^{(0)}(k)} \times 100\% \qquad (4)$$

The formula of correlation coefficient is shown as follow.

$$\eta(k) = \frac{\min\{\varepsilon^{(0)}\} + \rho \max\{\varepsilon^{(0)}\}}{\varepsilon^{(0)}(k) + \rho \max\{\varepsilon^{(0)}\}} (k = 1,2,\cdots,n) \qquad (5)$$

ρ is resolution ratio. $0 < \rho < 1$, $\rho = 0.5$. Calculate the fitted value (predicted value), correlation coefficient, error. As shown in Table 5.

Table 5: Parameter Table of Fitted Value (Predicted Value), Correlation Coefficient, Error

Year	No. k	Actual Value $x^{(0)}(k)$	Predicted Value $\hat{x}^{(0)}(k)$	Absolute Error $\varepsilon^{(0)}(k)$	Relative Error $q(k)$	Correlation Coefficient $\eta(k)$
2008	1	231900	231900	0	0	1
2009	2	221100	221128	28	0.01%	0.99
2010	3	241100	246067	4967	2.06%	0.51
2011	4	284100	273820	10280	3.62%	0.33
2012	5	300500	304702	4202	1.40%	0.55

When $\rho = 0.5$, calculate the correlation degree $r = \frac{1}{n}\sum_{k=1}^{n}\eta(k) = 0.676 > 0.6$. As a result, the degree of fitting of the model is good.

Variance of original sequence, $s_1^2 = \frac{1}{n}\sum_{k=1}^{n}(x^{(0)}(k) - \overline{x})^2 = 958070400$

Variance of residual sequence, $s_2^2 = \frac{1}{n}\sum_{k=1}^{n}(\varepsilon^{(0)}(k) - \overline{\varepsilon})^2 = 14427274$

Variance ratio, $C = \frac{S_2}{S_1} = 0.015$

Frequency of small error, $P = p\{|\varepsilon^{(0)} - \overline{\varepsilon}| < 0.6745 \, S_1\}$

According to the Table 6, we can inspect the he degree of fitting of the model. If the residual, correlation degree and posterior variance can get past the inspection, we can use the built model to forecast. On the contrary, we need to correct the residual so that can improve the precision of the model.

Table 6: Registration Form of Model Fitting Precision

Precision Level	Level 1(Good)	Level 2(Qualified)	Level 3(Barely Qualified)	Level 4(Unqualified)
P	>0.95	>0.80	>0.70	≤0.65
C	<0.35	<0.50	<0.65	≥0.65

Because $|\varepsilon^{(0)} - \overline{\varepsilon}| = (3895.4, 3867.4, 1071.6, 6384.6, 306.6)$ and $0.6745 \, S_1 = 20877.6$, we can obtain $|\varepsilon^{(0)} - \overline{\varepsilon}| < 0.6745 \, S_1$ and P=1. According to the Table 6, P>0.95 and C<0.35. As a result, the precision level of the model is level 1. The forecasting result with the model is reliable.

2.4 Model Forecast

After residual testing, correlation degree testing and posterior variance testing, the model has excellent accuracy. We can forecast the demand of Shanghai financial service outsourcing talents with the model. The results are shown in Table 7.

Table 7: Forecast of Number of Financial Industry Employees in Shanghai

Year	2013	2014	2015	2016	2017
Number of People	339069	377310	419864	467218	519913

According to the forecasting results, the average annual growth rate of number of financial service outsourcing employees in Shanghai is 11%. The number of financial service outsourcing employees will be more than 0.5 million. Residual testing, correlation degree testing and posterior variance testing indicate the precision level of the Grey Model (1, 1) is level 1. In theory, the forecasting results are reasonable. We can draw the below conclusion. The number of Shanghai financial service outsourcing employees shows the steady trend. It reflects the rapid development of Shanghai financial service outsourcing and constant adjustment and optimization of Shanghai industrial organization. [2] Governments at all levels, financial institutions and universities in Shanghai should speed up the training of financial service outsourcing to adapt to the needs of financial industry.

3. Training Strategies of Shanghai Financial Service Outsourcing Talents

3.1 Train the Financial Professional Talents

In China (Shanghai) Pilot Free Trade Zone, China Banking Regulatory Commission supports the promoters who are satisfied with conditions to create automobile financial company, consumer finance company and financial leasing company etc. This requires financial professional talents. The primary task of the construction of financial talents is to cultivate high-level financial talents. It also should cultivate a group of inter-disciplinary talents who are mastering core financial technology, such as product development, risk management etc, and a lot of knowledge, such as accounting, law, investment and information technology etc.[3] At the same time, it should cultivate talents with Registered Financial Analysts, Registered Financial Planner, Financial Risk Manager and other qualification certification. It should be focus on improving innovation ability and professional ability and promote financial training program vigorously, such as promoting the senior seminar, "Development and Innovation of International Finance", which is opened by Fudan University and Columbia University.

3.2 Train Talents with International Financial Experience

Global economic integration and market competition internationalization have become the main trend of the current global economic development. China's financial industry is not only the competition among domestic financial institutions, but need to face the competition from financial giants worldwide. However, Shanghai is lack of financial talents with international experience who are familiar with international business. On Sep.30, 2013, China (Shanghai) Pilot Free Trade Zone is built. Financial institutions can open up offshore business and cross-border financing business in China (Shanghai) Pilot Free Trade Zone. It is required to have lots of financial talents with international experience. Shanghai can implement the strategy of "Bring in and Going out". Let the financial talents study abroad. It should strengthen the integration with the international education, introduce the international advanced financial theory and improve the financial talents' awareness of globalization and decision level. At the same time, it should introduce financial talents with international experience who are familiar with international business.

3.3 Optimize the Environment of Financial Talents Introduction

Shanghai should perfect residence permit system, relax the settled restriction of financial talents who have bachelor degree and above and formulate preferential policy to attract overseas financial talents to work in Shanghai. For the overseas high-level financial talents, it can provide exit and entry convenience. For the resident foreigners, it can extend the deadline of residence permit according to actual requirement. [4] It also can increase tax preferences and rewards of scientific and technological achievements. For example, in August 2009, Shanghai government formulated "Stipulations about strengthening financial service and promoting financial development through gathering financial sources in Shanghai". This policy further refined the incentive and service measures of financial talents. [5]

3.4 Ensure the Internal Demand of Financial Talents in Enterprises

Enterprises should train different level employees regularly and provide the subsidies of time and money. For the senior financial talents, they are arranged to study abroad regularly. Enterprises should establish a continuing education system and encourage employees to universities or training institutions to receive the continuing education. At the same time, enterprises should establish and perfect the financial talents pool and select a group of outstanding financial graduates as the trainees and send the trainees to train in overseas famous financial institution.

References

Li Haitao (2011). Demand Forecast of Financial Talents According to Grey System Theory. Journal of Handan Polytechnic College, 24(2), 26-29.

Chen Lixing (2008). Analysis of Talents Gap of Supply and Demand about Chengdu ITO Enterprises and Research on Training Strategy. Chengdu: University of Electronic Science and Technology of China.

Wu Xiaoling (2011). Big Power Needs Multi-level Financial Talents for Financial Gaming. China Finance, (16), 10-11.

Wen Yuechun, Zhu Liping, Yan Shumin (2007). An Investigation on the Issues of Human Resources of Shanghai's Construction of International Financial Center. Tongji University Journal Social Science Section, 18(4), 106-112.

Fang Xinghai (2010). Train and Bring up the International Financial Talent in the Construction of International Financial Center. China Finance, (9), 18-19.