Effects of Management Innovation on Telecommunication Industry System

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Abstract: - Management innovation is one of the important factors to promote the development of the industry system except capital, labor and technology. But a little attention is paid to the effects of management innovation on telecommunication industry system, which results in two questions: what's the contribution of management innovation on industry development? And how does management innovation affect industry development? This paper addresses the two main research questions by taking China's telecommunication industry as an example. The Cobb-Douglas production function model is improved to measure the contribution of management innovation, and the mode of management innovation affecting industrial development is also explained. The results show that management innovation exerts great influences on telecommunication industry system with its contribution degree increasing gradually, and management innovation is the core element relating labor, capital and technology in industry development. Based on these, dynamic models for the industry system are constructed, and conclusions and implications are given in the final part of the paper.

Key-Words: - Management innovation, Telecommunication industry system, Production function, Dynamic model

1 Introduction

In today's globalized world, innovation is an essential element for the survival of organizations[1]. According to Schumpeter (1982), five types of innovation can be identified: introducing a new product or a qualitative change in an existing product; presenting a completely new process to a company; opening a new market; developing new sources of raw material supply and other inputs and making changes in the industrial organization through a new form of management[2]. These types of innovation may be copied by competitors rather easily. While the most complicated type of innovation is management innovation, which refers to invention and implementation of a new management practice, process or structure that represents a significant and novel departure from generally accepted or standard management practices, and intended to further organizational goals[3].

Although many scholars have argued the importance of management innovation[4-6], very little attention is paid to the effects of management innovation on industry system, especially on the development of telecommunication industry system, which results in the two questions: what's the contribution of management innovation on industry system? And how does management innovation affect industry development? This paper will address the two main research questions by taking China's telecommunication industry as an example since we have collected all data supporting our study of this industry.

We organize this paper as flows except the introductory one. Part 2 reviews related literature. Part 3 constructs measurement model of contribution of management innovation by developing Cobb-Douglas production function. Part 4 calculates any analyzes the contribution of management innovation on the development of China's telecommunication industry, and explores the path of management innovation affecting industry development. Part 5 studies the main affecting factor of management innovation, and depicts the mode of management innovation affecting industry system, and constructs dynamics models for the industry system. We give conclusions and managerial implications in Part 6.

2 Literature review

2.1 Development of the industry system

The industry system is an input-output system where materials are converted into products. Development process of the industry system is a mathematical function of input factors of production. Originally, the input elements only include capital and labor. Capital and labor are input into the industry system to gain output. If Y represents output and K and L represent capital and labor inputs, then the aggregate production function for industry system can be written as

$$Y=F(K, L)$$

Cobb and Douglas specified its form as

$$Y = K^{\alpha} L^{\beta}$$

which is the famous Cobb-Douglas production function. Later, technology was taken into consideration as an input factor of industry system. Solow used the phrase "technical changes" as a shorthand expression for any kind of shift in the production function. Thus slowdowns, speed-ups, improvements in the education of the labor force, and all sorts of things will appear as "technical changes". And then he gave the form of production function:

$$Y = F(K, L; A)$$

where A is constant presenting technological issues. Thus the development function for the industry system is

$$Y = AK^{\alpha} L^{\beta}$$

Shifts in the production function are defined as neutral if they leave marginal rates of substitution untouched but simply increase or decrease the output attainable from given inputs. In that case the production function takes the special form:

$$Y = A(t)K^{\alpha} L^{\beta}$$

And the multiplicative factor $A(t)$ measures the cumulated effect of shifts over time, which presents technological progress. Further, Tinbergen gave the special form of $A(t)$, which made the production function more accurate.

$$A(t) = A_0 e^{\lambda t}$$

Estimation of technological progress over time is useful because it helps evaluate characteristics that influence the development of industry system. But it's not enough for it should be noticed that $A(t)$ is a broad sense concept which consists of factors contributing to efficiency enhancement except labor and capital, including purely technical factors, as well as managerial factors such as production organization and the institutions. There are many studies on the importance of management innovation to economic growth of the industry system, but most of them are based on qualitative analysis and few quantitative analyses are made of its contribution.

2.2 Measurement of management innovation

Management innovation has received some research attention in the field of its relationship with industry development[7]. Baumol argues that advances in management practice contribute to long-term improvements in macroeconomic performance[8].

This assertion seems to have been almost universally accepted by business historians who typically describe a new way of organizing or a new management method in terms of its contribution to increased factor productivity and/or heightened competitive advantage[9-10].

The measuring method of contribution of management innovation follows the logic of production function. Tinbergen is recognized as the first to propose the total factor productivity question by the American economic community[11], and then, scholars gradually enrich and perfect the concept of total factor productivity. Solow and Dennison proposed in 1957 the econometric model which can be used to quantitatively calculate the contribution of technology advancement to the economy growth, where technology advancement contribution to the growth of the economy is the remnant which deducts the contributions of capital and labor.

All of the factors affecting economy growth except labor and capital constitute the so-called technology advancement in broad sense, and technological advancement can be broadly divided into two aspects: the scientific and technological progress and the improvement in the efficiency of resource allocation, which are known as the results of technological innovation and management innovation respectively. Therefore, in the economy growth, contributions of the remains of deducting the capital and work contributions are the contribution of technology advancement in broad sense to the economy growth, and management innovation contribution to the economy growth is the remains of technology advancement contribution in broad sense deducting the contribution of scientific and technological progress[12].

3 Measurement model

3.1 Improvement of production function

There are many methods to measure the contribution of inputs to the economy growth which can be included in two kinds: the total quantity reckoning methods, and the index system methods[13-14]. The quantitative methods include the production function, such as Cobb-Douglas production function, linearity production function and the production function of substituting fixedly, and the growth equation. If the purpose is to analysis the relations between inputs and output, or to measure the technology level, growth equation is available, but, if the purpose is to measure the effect of technology advancement on the rate of output, the growth equation is required[15]. In this paper, we aim to measure the influences of the management innovation on the economy growth of telecommunication industry, and therefore the growth equation is applied.

We firstly consider the famous Cobb-Douglas production function $Y = AK^{\alpha}L^{\beta}$. Taking the logarithm, the derivation may result in:

$$\frac{\frac{dY}{dt}}{Y} = \frac{\frac{dA}{dt}}{A} + \alpha\frac{\frac{dK}{dt}}{K} + \beta\frac{\frac{dL}{dt}}{L} \quad (1)$$

The left side of the formula delivers the rate of output increase. The first item on the right is the speed of technology advancement. The second and the third item are the product of parameter and rate of capital increase, and the product of parameter and rate of labor increase respectively. α is the output elasticity of capital, and β is the output elasticity of labor. Because the data of Y, L, and K are discrete, the above equation needs to be discretely processed.

Therefore:

$$\frac{\Delta Y}{Y} = \frac{\Delta A}{A} + \alpha\frac{\Delta K}{K} + \beta\frac{\Delta L}{L}$$

Let: $y = \frac{\Delta Y}{Y}$, $a = \frac{\Delta A}{A}$, $k = \frac{\Delta K}{K}$, $l = \frac{\Delta L}{L}$

and we get:

$$y = a + \alpha k + \beta l \quad (2)$$

where y is the rate of output increase, and k is the rate of capital increase, and l is the rate of labor increase. a is the rate of technology advancement, and α is output elasticity coefficient of capital (when other condition is invariable, if capital increases 1%, output increases α %), and β is output elasticity coefficient of labor (when other condition is invariable, if labor increases 1%, output increases β %). E_A is the contribution of technology advancement to the development of industry system which equals $\frac{a}{y}\times 100\%$, and E_K is the contribution of capital which equals $\frac{\beta l}{y}\times 100\%$, and E_L is the contribution of labor which equals $\frac{\alpha k}{y}\times 100\%$. Therefore, as long as α,β are calculated, the values of E_A , E_K and E_L can be calculated.

In (2), αk and βl are the contributions of capital and labor to the growth of telecommunication industry system separately, and a equals $\Delta A / A$ which is used to measure the contribution of technology advancement to the growth of the output. But $\Delta A / A$ actually is an integration term including all other factor's influence on the industry system besides labor and capital. Therefore, separating the technology advancement is necessary. We use T to represent technology, and the production function model can be expressed as

$$Y = A^{'}(t) K^{\alpha} L^{\beta} T^{\gamma} \quad (3)$$

where γ is elasticity coefficient of T (when other condition is invariable, if technological capacity increases 1%, output increases γ%).

3.2 Function of technology development

In communication industry, the advancement of industrial technology can be measured by the development of communication capacity. Thus T in (3) can be represented by communication capacity. There are two main kinds of communication capacity: capacity of fixed-line telephone exchanges and capacity of mobile telephone exchanges. We use (4) to integrate the two kinds of capacity.

$$T_{jZ}^{I} = \frac{T_j^I - T_{\min}^I}{T_{\max}^I - T_{\min}^I} (T_{\max}^m - T_{\min}^m) + T_{\min}^m \quad (4)$$

where T_{jZ}^{I} is the converted value of I kind of communication capacity in J year; T_j^I is the actual value of I kind of communication capacity in J year; $T_{\max}^I$ is the maximum value of I kind of communication capacity; $T_{\min}^I$ is the minimum value of I kind of communication capacity; $T_{\max}^m$ is the maximum value of all kinds of communication capacity; $T_{\min}^m$ is the minimum value of all kinds of communication capacity.

3.3 Function of management innovation

We suppose management innovation will evolve with time and its function is:

$$A^{'}(t) = \exp(A_0 + \lambda t + \nu_t) \quad (5)$$

where A0 is the initial state of management innovation. t is time. λ is the speed of management innovation. ν_t is the stochastic error.

3.4 The function for contribution measurement

Substitute (5) into (1) and we get

$$Y = e^{A_0 + \lambda t + \nu_t} K^{\alpha} L^{\beta} T^{\gamma} \quad (6)$$

Take logarithm for all variables in (6), and we get:

$$\ln Y = \ln A_0 + \lambda t + \alpha \ln K + \beta \ln L + \gamma \ln T \quad (7)$$

According to (3) we can get

$$\frac{\Delta Y}{Y} = \frac{\Delta A^{'}}{A^{'}} + \alpha \frac{\Delta K}{K} + \beta \frac{\Delta L}{L} + \gamma \frac{\Delta T}{T}$$

Let $a^{'} = \frac{\Delta A^{'}}{A^{'}}, t = \frac{\Delta T}{T}$

and we get:

$$y = a^{'} + \alpha k + \beta l + \gamma t$$

and $a^{'}$ can be denoted as

$$a^{'} = y - \alpha k - \beta l - \gamma t$$

Thus, $E_{A^{'}}$ equals $\frac{a^{'}}{y} \times 100\%$, which represents the contribution of management innovation to the development of industry system.

4 Contribution of management innovation

4.1 Contribution values

In order to calculate contribution of management innovation, we collect data of China's telecommunication industry from 1991 to 2005, where business volume is regarded as Y (see Table1).

Using data in Table 1, we make regression analysis of (4), and the results are obtained as follows (R^2=0.998509):

λ =0.0884, α =0.3163, β =0.2960, γ =0.6528

$$y = \frac{\Delta Y}{Y} = \frac{Y_{2005} - Y_{2004}}{Y_{2004}} = 0.2012$$

k = -0.0533, l = 0.0692, t = 0.1593

$$E_K = \frac{\alpha k}{y} \times 100\% = -8.3690\%$$

$$E_L = \frac{\beta l}{y} \times 100\% = 10.1759\%$$

$$E_T = \frac{\gamma t}{y} \times 100\% = 51.6609\%$$

$$a = y - \alpha k - \beta l - \gamma t = 0.0936$$

$$E_{A^{'}} = \frac{a^{'}}{y} \times 100\% = 46.5325\%$$

We use the average contribution of management innovation from 1991 to 2005 to present the contribution of management innovation in 2005, and by this way we can get a series of contributions from 1992 to 2005 (see Table 2). Similarly, the contributions of capital, labor and technology advancement to the development of telecommunication industry from 1992 to 2005 can be calculated.

Table 1 Data of telecommunication industry from 1991 to 2005

Year	Business volume (100 million Yuan)	Capital (100 million Yuan)	Labor (10000 person)	Capacity of mobile telephone exchanges (10 000 subscribers)	Capacity of fixed-line telephone exchanges (10 000 units)
1991	151.6	86.1	43.3	10.5	1492.2
1992	226.6	162.5	45.6	45.3	1915.1
1993	382.5	404.2	46.8	156.1	3040.8
1994	592.3	775.8	48.4	371.6	4926.2
1995	875.5	995.2	47.9	796.7	7203.6
1996	1208.8	1083.0	57.8	1536.2	9291.2
1997	1629.0	1291.0	57.5	2585.7	11269.2
1998	2264.9	1772.0	57.0	4706.7	13823.7
1999	3132.4	1867.1	58.9	8136.0	15346.1
2000	4559.9	2223.8	60.2	13985.6	17825.6
2001	5754.6	2553.2	61.3	21926.3	25566.3
2002	7089.7	2073.3	59.8	27400.3	28656.8
2003	8531.2	2217.6	64.1	33698.4	35082.5
2004	11046.0	2199.1	61.9	39684.3	42346.9
2005	13268.9	2097.8	63.3	48241.7	47196.1

Table 2 Contributions of management innovation from 1992 to 2005

Year	$E_{A'}$
1992	0.25638
1993	0.09194
1994	0.10872
1995	0.38206
1996	0.30790
1997	0.37914
1998	0.17123
1999	0.48986
2000	0.38190
2001	0.39391
2002	0.78686
2003	-0.11920
2004	0.54659
2005	0.46533

Table 2 shows that, from 1992 to 2005, the contribution of management innovation to China’s telecommunication industry as a whole rises with steady steps to the economy growth of telecommunication industry system.

Over the past 20 years, the impetuses of China’s communication industry development come from two aspects: one is the management reform, and the other is the introduction of new business[16]. In the management aspect, as a developing country, relaxing administrations or supervision will affect China's telecommunication equipment manufacturing, telecommunications infrastructure network and telecommunication service industry. Faced with the direct challenges from enterprises with advanced technology and abundant fund of the major developed countries[17], the choice of telecommunication economic development policy will determine the direction, the service level and enterprise competitive ability of telecommunication equipment manufacturing industry and the telecommunication service industry[18]. Therefore, from the early 1990s, China has accelerated the management innovation and reformed in telecommunication industry by breaking the monopoly of the Ministry of Posts and Telecommunications (MPT) and by establishing new state-owned enterprises. In 1994 China United Telecommunications (China Unicom) was set up to foster domestic competition and later Jitong Network Communications Company (Jitong) became the third telecommunications operator in China, which means that China's telecommunications market bid farewell to the era of monopolies. From 1998 the central government of China began to take a proactive approach in reforming the industry. These drastic reforms were heralded by the merging of the MPT and the Ministry of Electronic Industry (MEI) to form the Ministry of Information Industry (MII) in March 1998. After the reorganization, the MII came to oversee telecommunications, multimedia, broadcasting, satellites and the Internet in China. Moreover, the National Information Infrastructure Steering Committee (NIISC) was dissolved. This institutional reorganization was a major landmark in China’s telecommunications reform because regulation and operations were formally separated for the first time since the establishment of the People’s Republic[19]. This marks that China realizes the separation of government and business, and fundamentally opens the door to the market. The establishment of China Mobile in 1999 and China Netcom in 2002 further deepened the market-oriented process of China's telecommunications industry. Henceforth, the direction and content of management reform of China's telecommunication industry keeps in line with the international development trend of the telecommunications industry[20]. In the business innovation aspect, in 1987 the Chinese first simulation mobile phone was operational, and in 1994 the GSM service was operational for the first time in China; in 1998 PHS served the official investment commercial; in 2002 China Unicom provided the CDMA service officially. The series of management reforms and innovations have played a decisive role in promoting the development of China's telecommunication industry in the past 20 years.

Although the contribution of management innovation on telecommunication industry is bigger and bigger with time, it actually presented the fluctuations in 1993, in 1994, in 1998 and in 2003. Before 1994, China's telecommunications market has been monopolized, and lacked the motive and the incentive mechanism for management innovation. Technology and the market revolutionary transforms were continuously striking against telecommunication industrial policy development[21], the corresponding telecommunication policy construction also fell behind technology development[22]. Although China Unicom's establishment in 1994 means that the China's telecommunications market bid farewell to the era of monopolies, and telecommunication industry management innovations have made significant progress, these efforts can not take effect immediately, and the positive effects will become apparent in the later years. Meanwhile, the management and decision-making own inertia determines its influence will appear after a period of time. So the results of 1993, 1994 contain the influences of previous years, and the contributions of management innovation in the two years are very small.

In 1998 and 2003, the situations are quite similar. China's national economy development has suffered from many serious challenges from international and the domestic. Asian Financial Crisis in 1997 exerted directly and significant impacts on China's foreign trade. In 1998, the shrinking demand, coupled with the pressure of non-depreciation of Renminbi makes China's macro-economy unsatisfactory. Moreover, in 1998 China suffered a serious flood disaster in the national wide. In this macro environment, as one of China's leading industries, the development of telecommunication industry has also been blocked. In 2003, the third Gulf War led directly to the international price of oil rising perpendicularly, which caused China's economy encountered a daunting challenge. Furthermore the spread of SARS epidemic has disrupted the orderly operation of the national economy seriously. And in 2003 the telecommunication operation still solely depended upon the voice services, and felled into a price war. Therefore, in this year the main work of management in telecommunication industry is to stabilize the internal structure and to maintain the routine work, so the contribution of management innovation to the development of China's telecommunication industry's economy is somewhat low.

4.2 Effect paths

When asked about the how management innovation promotes industry development, many people will explain that management innovation can promote production efficiency and provide the direction to development[23]. Although it is quite true, we regard it as a direct path for management innovation affecting industry development, and we argue that there are other indirect ways. In order to find the paths that management innovation contributing to the development of industry system, we draw the curves of contributions of management innovation, capital, labor and technology in Fig. 1.

In general, the contribution of labor to China's telecommunication economy growth is small, while the capital's is big, which is in line with China's current reality. In the development of telecommunication system, the contribution of technology advancement in broad sense is big, which on average, accounts for about 70% .The contribution of the management innovation accounts for around 40% in total contribution of the technological advancement, while the contribution of technology around 60 %. This is because since the Reform and Opening, China has made massive technology introduction to the telecommunications industry in order to keep up with the development of telecommunication technology in the world.

By comparing the curves in Fig. 1, we find that $E_{A'}$ is negatively correlated with E_K for when E_A rises, E_K will decline. This indicates the substitution of management innovation for capital/investment, which means promoting management innovation can economize investment. Thus, an important conclusion can be got that one way for management innovation affecting industry development works on investment.

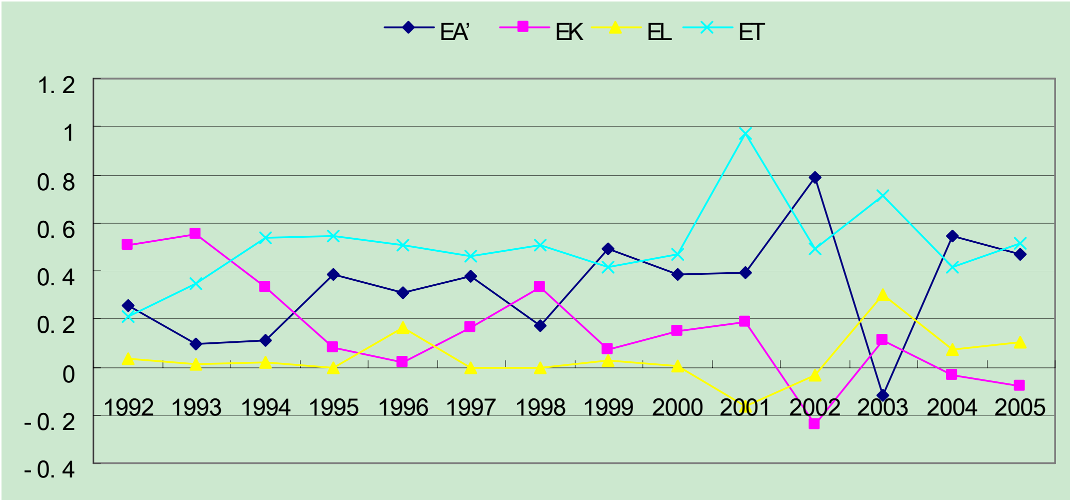

Fig.1 Contributions of capital, labor, technology advancement and management innovation

Similarly, we can also find $E_{A'}$ is negatively correlated with E_T although this relationship is not much conspicuous, which implies that management innovation can offset insufficiency of technological development to some extend. This finding is also of significance for it just proves what scholars have argued in the field of management innovation. The incidental finding is that E_T is negatively correlated with E_L, and the indication is technological development can save labor. But there is no dependency relation between E_T and E_K. Also, our results show the negative correlation between E_K and E_L, which is in line with the well-known conclusion about capital and labor.

Thus, we can depict the paths of management innovation in Fig.2.

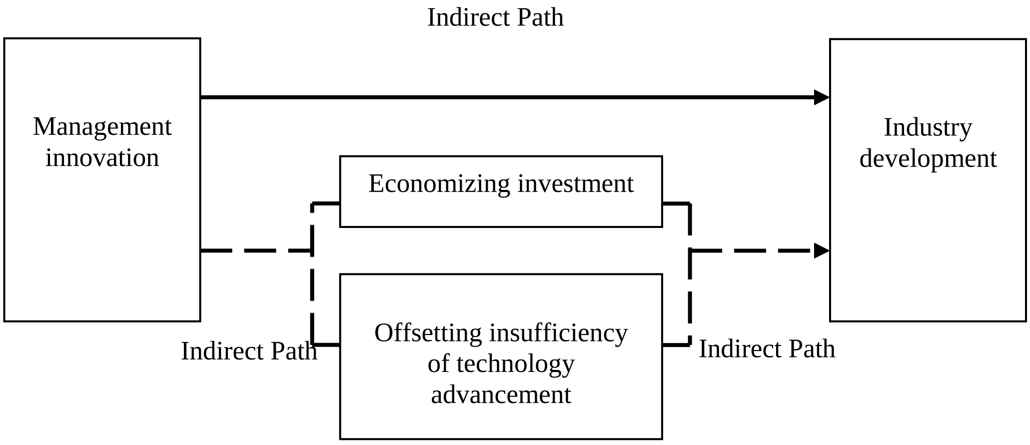

Fig.2 Effect paths of management innovation

5 Effects of management innovation

5.1 The main affecting factor of management innovation

According to the above analysis, we can see that the management innovation is one of the most important factors to promote the development of telecommunication system, and its contribution to the growth of telecommunication economy increases continuously. So, it is necessary to analyze the factors which impact management innovation in the telecommunications industry.

Fitting equation (6) using data, the state of management innovation of 1991 is:

$$A0 = 0.034447$$

then management innovation in 1992 is

$$e^{A_0+\lambda t} = 0.036882$$

Similarly, we can get values of management innovation from 1992 to 2005 which are illustrated in Fig.3.

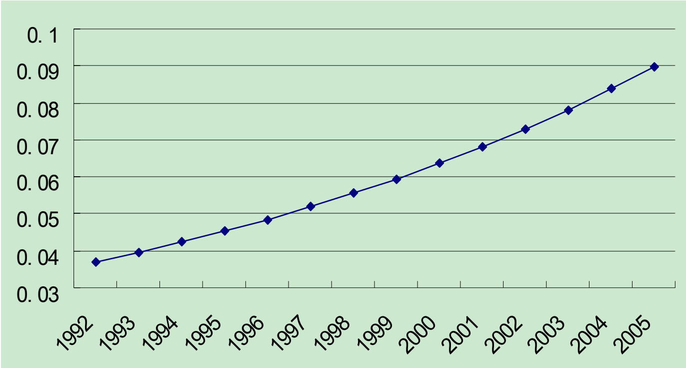

Fig.3 Values of management innovation from 1992 to 2005

Part 4 tells us that management innovation is related with labor, capital and technology. Thus we suppose the following function:

$$A' = b_0 + b_1 K + b_2 L + b_3 T + \xi \qquad (8)$$

We standardize data in Tab.2 and substitute them into (8), and we get

$$A' = 0.0249 + 1.22\times10^{-5} K + 2.49\times10^{-4} L + 4.12\times10^{-7} T$$

(7.874721) (9.174156) (3.720151) (18.81961)

F=897.2229, R^2=0.996299, R^2_{adj}=0.995188

Therefore, in the development of China's telecommunications industry system, labor is the most important factor to enhance telecommunication management innovation ability, followed by capital investment, and the development of telecommunications technology is relatively playing a small role to promote management innovation.

5.2 The mode of management innovation affecting industrial development

Combing all findings in our research above, we get Fig.4 which shows the mode of management innovation affecting industrial development.

In Fig.4, real lines represent the direct effects of four elements of production on industry development, and dotted lines represent indirect effects or the relationships between them. In this mode, we can see the significance of management innovation in the development of industry. Management innovation is impelled by labor, and it impels industry development by economizing investment and offsetting insufficiency of technological development except its direct impacts including promoting production efficiency and directing development. Thus management innovation is the core element relating labor, capital and technology.

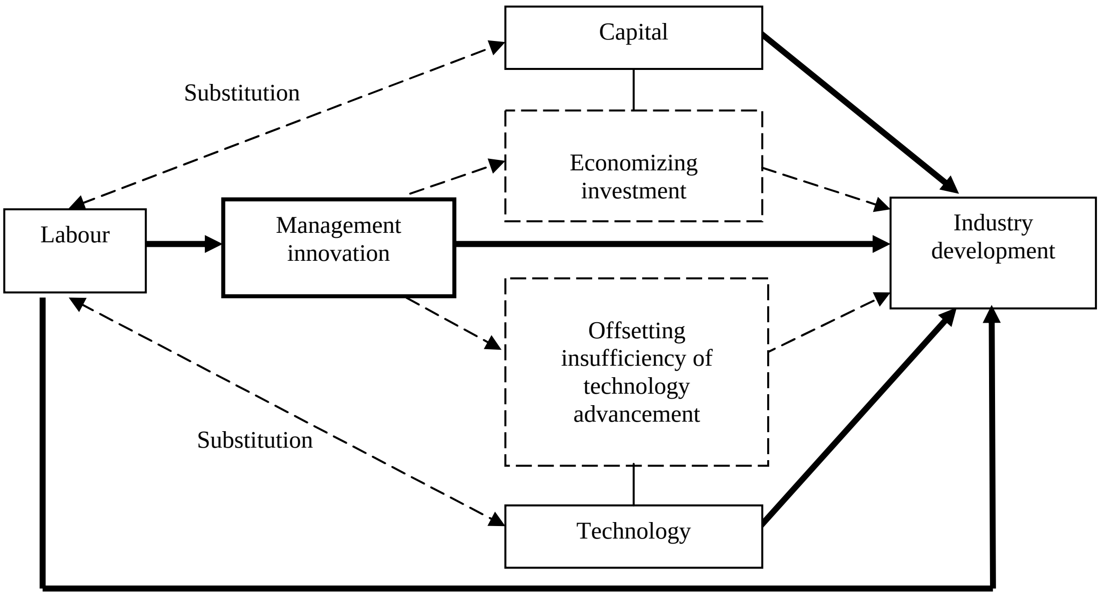

Fig.4 The mode of management innovation affecting the industry system

5.3 The dynamic model for the industry system

The industry system is a self organizing system, and we can apply methods in synergenics to analyze its dynamic model[24-25].

In Fig.4, we can see that in the industry system, the output is substantially determined by management innovation. Thus, Y can be regarded as the order parameter of the industry system, and *A'(t)* is the dynamic parameter. We can establish the dynamic model for the industry system according to Haken model[26].

$$Y' = -\lambda_1 Y - \theta Y A' \quad (9)$$

$$A' = -\lambda_2 A' + \rho Y^2 \quad (10)$$

where λ_1 、 λ_2 、 θ and are control parameters. Suppose $\lambda_2 \gg \lambda_1$, and $\lambda_2 > 0$, and let $A' \approx 0$, we can get (11) from (10) by adiabatic process.

$$A' \approx \rho / \lambda_2 \times Y2 \quad (11)$$

Substitute (11) into (9) and we get:

$$\frac{dY}{dt} = -\lambda_1 Y - \frac{\theta\rho}{\lambda_2} Y^3 \quad (12)$$

And further we can get the potential function:

$$V_s = 0.5\lambda_1 Y^2 + \frac{\theta\rho}{4\lambda_2} Y^4 \quad (13)$$

Discretize the above model and we get:

$$Y(t+1) = (1-\lambda_1) Y(t) - \theta Y(t) A'(t) \quad (14)$$

$$A'(t+1) = (1-\lambda_2) A'(t) + \rho [A'(t)]^2 \quad (15)$$

Using data in Table 1 and Table 3 to fit (14) and (15), we can get:

λ_1 =-0.583, λ_2 =1.071, θ=-4.463, ρ =0.00005

Thus, the dynamic model for the industry system is

$$\frac{dY}{dt} = 0.583Y + 2.084Y^3 \quad (16)$$

and the potential function is

$$V_s = -0.292Y^2 - 5.209Y^4 \quad (17)$$

θ <0 indicates that management innovation can promote the development of industry system and the value of θ is relatively greater which indicates the promotion effect of management innovation on industry system is strong. λ_1 <0 implies that the industry system has established positive feedback mechanism which can promote its development. The absolute value of λ_1 is not so big, which indicates that telecommunication industry can not be promoted greatly by itself. ρ represents the effect of the industry system on management innovation. Because ρ >0, we argue that the development of the industry system can promote management innovation.

6 Conclusion

Based on the research of China's telecommunication industry, this paper believes that management innovation plays an important role in promoting the development of the telecommunication industry system. Among management innovation, capital, labor and technology advancement, the contribution of the technology advancement in broad sense which includes management innovation to the development of telecommunication industry system is higher than 70%, and the contribution of the management innovation to the development of the industry system is about 30%. Management innovation has played the extremely vital role in the development of telecommunication industry. Among the factors which influence management innovation, labor is the most important factor, followed by capital investment. Thus we get the mode of management innovation affecting the industry system, where it impels industry development by economizing investment and offsetting insufficiency of technological development except its direct impacts including promoting production efficiency and directing development. And according to these important findings, we can further establish dynamic models for the industry system. The results of estimating parameters of the models give us more understandings about telecommunication industry system and management innovation.

Our research not only makes theoretical contributions to the industry system and management innovation related literature, but also offers issues that could add to our understanding of managerial practices in China's telecommunication industry, and thus provides several guidelines for improvement. Firstly, China needs to further improve the market economy environment in which the elements of labor and capital are mobilized freely. Secondly, China should speed up the system's reformation to establish a management innovation system combining the labor, capital and market, and to increase input to the management innovation, and to further enhance efficiency of the use of capital, and to increase investments to support the core management ability to achieve breakthroughs. Thirdly, quality of labors should be improved so that management innovation capability can be promoted greatly and the telecommunication technology would make greater contribution to the telecommunications industry, so that the telecommunications industry can achieve better and faster development.

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