Academic Journal of Business & Management
ISSN 2616-5902 Vol.2, Issue 1: 112-124, DOI: 10.25236/AJBM.2020.020112

Evaluation of financial and tax institution on the transformation & upgrading of manufacturing industry: Based on the investigation of Chinese private enterprises

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ABSTRACT. *This paper uses the DEA and C-D functions to analyze the Transition & Upgrading efficiency of the manufacturing industry and the policy incentive effect. It is found that the overall Transition & Upgrading efficiency of manufacturing industry is low, the scale efficiency is good, the technical efficiency is low, and the overall scale return is decreasing, indicating that the investment resource structure and direction should be optimized. Tax policy has positive incentive to some extent while fiscal policy has negative impact. It mainly through the investment of science and technology funds in Transition & Upgrading efficiency. In addition, the level of entrepreneurs in private manufacturing industry is negatively correlated with the efficiency of Transition & Upgrading, and foreign trade can reverse promote the improvement of the efficiency of Transition & Upgrading.*

KEYWORDS: *Private manufacturing; Transition &Upgrading efficiency; DEA-CD*

1. Introduction

In China, the Transformation & Upgrading of private manufacturing industry is an important part of the current economic restructuring. Since 2012, China has continued to implement large-scale tax reduction policies and fiscal policies to promote the development of the real economy, greatly optimizing the development environment of the private economy, especially the private manufacturing industry. However, the system logic under different policies has certain differences, and the policy perception of private manufacturing industry in transformation and upgrading also has obvious differences, so the effect of tax policy and fiscal policy may have different effects. Therefore, the classified evaluation of the financial and tax system will effectively reveal the different effects of the policy, so as to improve the policy implementation strategy and improve the efficiency of the system.

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Transition & Upgrading has been the theme of China's economic development in recent years. Transformation refers to the timely transformation when the original industry has been difficult to provide enterprises with enough space for growth[1],which is the act of switching between industries and changing development patterns[2],a means of injecting new life into an organization[3]. Upgrading refers to the improvement of enterprises' position in the industrial chain and value chain [4], and the transformation process from labor-intensive products to capital-intensive or technology-intensive products [5]. In addition, it also includes the upgrading process of new products, services, brands and markets based on capacity and value improvement [6]. Finally, it increases the productivity of the enterprise and the production rate of [7], and most of the time, it's the transition from the generation to the independent, from the OEM to the ODM and the upgrade to the OBM. In terms of influencing factors, most scholars believe that it is the result of the combined effect of endogenous agent and exogenous agent [10], including the acquisition of key resources and abilities, innovative enterprise culture, entrepreneurship [11] and government support [12]. At the micro level, the empirical research is mainly based on the scale construction, and attempts are made in terms of enterprise scale, innovation ability, export scale, market structure [13-14], economic effect and quality brand [15]. The influence of environmental changes on the factors causing environmental changes [16]. However, most China's manufacturing industry is weak in capital, access to key resources, enterprise ambition and risk resistance, so the government will provide relevant policy support. However, most of the existing studies analyzed the promotion effect of government support on transformation and upgrading from a qualitative perspective [17], lacking analysis on the efficiency of transformation and upgrading and relevant incentive policies.

The efficiency of Transition & Upgrading refers to the output of the effect of unit Transition & Upgrading under the circumstance of environment and resource allocation. The existing research on Transition & Upgrading lacks the analysis of efficiency, and mostly focuses on the evaluation of innovation input efficiency, mainly from the perspective of index construction and methods. Fang-mei Tseng and Yu-jing Chiu evaluate the performance of high-tech industries in manufacturing industry from four aspects, including finance, competition, manufacturing and innovation ability [18]. Yang yi et al. constructed an evaluation index system of input, allocation, output and support for technological innovation [19].Hong-chuan Chen has designed an evaluation index system for the international competitiveness of high-tech industries in terms of input, output and technological innovation capacity [20]. Chakrabarti A K evaluates the innovation efficiency of the United States, Japan and other countries from the perspective of patent invention [21]. Chung-jen Chen and hsueh-lung Wu et al. used DEA to analyze the innovation situation of related industries in Taiwan [22]. Jun-hong Bai et al. evaluated the research and development efficiency of Chinese provinces with DEA [23]. Based on DEA and Malmquist indexes, Pei-zhe Li et al. evaluated the innovation efficiency of high-tech industries in different provinces from the perspectives of fund input, personnel input, new product sales revenue and number of effective invention patents [24]. Using the GMM method, Wu Qiang et al. found that the ratio of r&d

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subsidies can promote the input of innovation in strategic emerging industries [25]. Guang-qiang Liu empirically concluded that tax incentives have a positive effect on R&D investment, while fiscal subsidies have the opposite effect [26]. Empirical analysis by De-yin Chu et al. shows that financial subsidies have a positive incentive effect on patent output, while tax incentives have the opposite effect [27].

In summary, fiscal and taxation policy plays an important role in enterprise innovation. The impact of tax policy and fiscal subsidy policy is different, but there are few studies on the efficiency of policy input combined with transformation and upgrading. This paper uses DEA (Data Envelopment) -CD model to analyze the efficiency of fiscal and taxation input of 67 private manufacturing enterprises in coastal areas. This paper also makes an in-depth analysis of the incentive effect of the transformation and upgrading of private manufacturing industry, which can provide a reference for the choice of government policy tools.

2. Theoretical analysis

Private manufacturing industry is mostly small in scale and low in risk resistance. Due to the uncertainty of income brought by transformation and upgrading, enterprises usually tend to avoid risks, and the existence of revenue path dependence under the original development mode makes it difficult for private manufacturing industry to achieve active transformation and upgrading. Through obtaining financial support from local governments and relevant tax preferences, the trigger point of transformation and upgrading of private manufacturing industry can be reduced, the cost of transformation and upgrading of enterprises can be reduced, and market risks can be avoided. Therefore, policy input is one of the elements of transformation and upgrading of private manufacturing industry.

The policy input of transformation and upgrading of private manufacturing industry is mainly divided into fiscal subsidy policy, tax policy and financing policy. In theory, the three can effectively support the transformation and upgrading of private manufacturing industry, but the mechanism is different and the effect is different. Fiscal policy and financing policy are pre-incentives, mainly to solve the financial needs of enterprises'transformation and upgrading, but it is difficult to monitor the results. If the subsidies are too large, it may lead to opportunistic behavior of enterprises. If the subsidies are too small, the support for enterprises is relatively limited, which is not enough to trigger the critical point of transformation and upgrading. Tax policy is an afterward incentive, which can effectively reduce the probability of opportunistic behavior of enterprises, but quite a number of private manufacturing enterprises as the main body of tax obligations have poor financial norms, and it is difficult to obtain the support of tax policy. Therefore, the impact of fiscal and taxation policy input on transformation and upgrading is not only the effect of the problem, but also the impact of corporate behavior is quite different.

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3. Research design

Based on DEA analysis model, this paper evaluates the efficiency of government industrial policy input and enterprise factor input in the Transition &Upgrading of manufacturing industry from two qualitative and quantitative dimensions. Then, C-D function is used to build an empirical analysis model to explore the influencing factors of Transition &Upgrading efficiency. DEA model is mostly used for input-output efficiency evaluation, which is divided into CCR model and BBC model. The former is constant scale reward and the latter is variable scale reward. C-D production function is the influence of factor input, and its coefficient reflects the influence of variables on output.

3.1 DEA model design

BCC model does not require all *DMU* to be in the optimal size state. The frontier efficiency curve is composed of multiple straight lines. Considering the insufficiency of competition in the private manufacturing market, BCC model is more suitable for this paper.

Suppose there are I decision-making units in the Transition &Upgrading efficiency analysis, denote as DMU_i, i=(1,2,3,...i),which represents all manufacturing companies involved in efficiency evaluation. Its mass $X_i=(X_{1i},X_{2i},\ldots,X_{ni})$, n is the number of inputs, which contains n 'qualitative indicators. The rest are quantitative indicators. Its output $Y_i=(Y_{1i},Y_{2i},\ldots,Y_{mi})$, m is the number of outputs, which contains m 'qualitative indicators. The rest are quantitative indicators. Let's assume ε is not Archimedes' infinitesimal. Then the DEA-BCC model of *DMUi* decision making unit can be expressed as follows:

$$\text{Min } \theta$$

$$\text{s.t.} \begin{cases} \sum_{i=1}^{n} x_i\lambda_i \le \theta x_0 \\ \sum_{i=1}^{m} y_i\lambda_i \ge y_0 \\ \sum_{i=1}^{n} \lambda_i = 1 \\ \lambda_i \ge 0,\ i = 1,\ 2,\ 3\cdots n \end{cases} \quad (1)$$

Introduction S^-、S^+ for slack variable, equation (1) can be replaced by the following equation (2).

$$\text{Min}[\theta - \varepsilon(\sum_{i=1}^{n} s^- + \sum_{i=1}^{m} s^+)]$$

$$\text{s.t.} \begin{cases} \sum_{i=1}^{n} x_i\lambda_i + s^- = \theta x_0 \\ \sum_{i=1}^{m} y_i\lambda_i - s^+ = y_0 \\ \lambda_i \ge 0, s^+ \ge 0, s^- \ge 0, \\ \sum_{i=1}^{n} \lambda_i = 1 \end{cases} \quad (2)$$

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Where λ_i is the weight combination of *DMUi*. The model indicates that if both pure technical efficiency and scale efficiency are 1, then DEA is effective. If one of them is 1, then it is weak DEA effective. If both are not 1, it means that non-dea is effective.

The production possible set T_{BCC} can be expressed as

$$T_{BCC} = \{(x,\ y) | x \geq \sum_{i=1}^{n} \lambda_i x_i,\ \sum_{i=1}^{n} \lambda_i = 1,\ i = 1,\ 2,\ 3,\ \cdots,\ n\}$$

S^- means that if the output is constant, the input can be reduced(Reducing policy supply). S^+ means that it can increase output if the input remains unchanged(Optimizing input structure).

(1) Input variables

Fiscal and taxation input is divided into financial subsidies and tax preferences. Four secondary indicators are designed to conduct a special questionnaire survey. Because fiscal and taxation policies have a certain threshold, not all enterprises can enjoy policies. Enterprises that do not enjoy fiscal and taxation policies need to be excluded from the input variables. Therefore, the questionnaire takes "enjoyment" as the choice sign. Grade I indicators are specific fiscal and taxation policy items, cumulative scores, equivalent to input intensity, as shown in Table 1 below.

Table 1 Input Variables Table

Policy Types	Policy Items
Tax policy	VAT, Income Tax, R&D, Additional Tax, Administrative Expenses
Fiscal policy	Scale awards, patent subsidies, government funds, financing subsidies

(2) Output variable

The direct explanation of output variable is the effect of Transition &Upgrading, which is divided into quantitative and qualitative aspects. Among them, the quantitative indicators directly select the main business income. Qualitative indicators to investigate the effect of enterprise Transition &Upgrading. Taking product level (brand, added value, gross margin), industrial chain (length, span), market (domestic, international, national project, e-commerce), internal management (system standard, information management, staff training, standardized certification) as dimensions. AHP was used to construct the evaluation system and conduct a questionnaire survey to calculate the transformation and upgrading value of each enterprise. Set the Transition &Upgrading observation point as *di,i=(1,2,…n)*is the number of observation points. *di* scores for each observation point, the weight of *wi* for each observation point, the effectiveness of Transition &Upgrading of qualitative indicators is the *DS* value is expressed as the $DS = \sum_{I=1}^{n} w_i d_i$.

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3.2 Design of incentive effect model of Transition &Upgrading efficiency

This paper studies the impact of manufacturing industry's Transition &Upgrading efficiency, focus on the analysis of fiscal and tax policies on the Transition &Upgrading efficiency of the impact. Considering that C-D (cobb-douglas production function) has some properties concerned by enterprises, it can better explain the contribution of various variables to output in the analysis and application of economic theory, so this model is adopted.

The C-D function is expressed as the influence and contribution of capital and labor input to production output at a certain technical level. In this paper, proper transformation and expansion are made to introduce T tax policy, G fiscal policy and E entrepreneur (chief executive officer). Considering the influence of Chinese enterprises in international trade, F foreign trade (export) is introduced to set up the basic empirical model for $Y = A(t)T^aG^bE^cF^d\mu$. *Y* is the Transition &Upgrading efficiency value calculated by DEA, and *A(t)* represents the technical level of the year. Fiscal and taxation policies *T* and *G* are assigned points through the enjoyment of enterprises, and 10 observation points are assigned from two aspects of taxes and fees (income tax, government fund tax, examination and approval fee) and finance (government subsidy and reward). A business gets 1 point for every support it receives. *E* is the educational level of entrepreneurs, divided into four levels, represented by Numbers, junior high school and below is 1, senior high school or technical secondary school is 2, junior college or bachelor's degree is 3, master's degree or above is 4. *F* stands for export, the export to developed countries in Europe and America is set as 1, otherwise 0, μ is random term.

4 Empirical analysis

4.1 Calculation of Transition &Upgrading efficiency

The BBC model was used to analyze the input amount with variable scale efficiency, and the DEAP2.1 software was used to calculate the Transition &Upgrading efficiency of 67 private manufacturing enterprises in coastal areas. Since the output variable is a qualitative value, the improved model of Chun-hao Li CKS-DEA is adopted to make the result more scientific [28]. In the analytic hierarchy process (AHP), strict isometric division method is adopted for the importance weight of each index of output. The most important index and the least important index are selected first, and then interval values are assigned. Confidence constraints are set as follows.

$$a_r \le \mu_r\left(\sum_{j=1}^{m} y_{rj}/m\right)/\sum_{r=1}^{n}\mu_r\left(\sum_{j=1}^{m} y_{rj}/m\right) \le b_r,\ r = 1,\ 2,\ 3\cdots m \quad (3)$$

In formula (3), a_r and b_r represent the lower limit and upper limit of output indicator estimation, and this constraint is composed of the mean value of all observation indicators of DMU decision making unit, and the contribution of each

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observation point indicator to the Transition &Upgrading is taken as the criterion for scoring by all experts.

The final results are shown in table 2.

Table 2 DEA operation results

DMU	Crste	Vrste	Scale	Sr	DMU	Crste	Vrste	Scale	Sr
1	0.807	0.807	1	-	35	0.363	0.396	0.915	drs
2	0.652	0.652	1	-	36	0.292	0.454	0.643	drs
3	0.993	1	0.993	drs	37	0.12	0.123	0.977	drs
4	0.211	0.31	0.682	drs	38	0.417	0.458	0.91	drs
5	0.342	0.357	0.957	drs	39	0.215	0.222	0.967	drs
6	0.349	0.366	0.954	drs	40	0.632	0.793	0.798	drs
7	0.405	0.821	0.493	drs	41	0.35	0.356	0.983	drs
8	0.363	0.575	0.632	drs	42	0.332	0.663	0.501	drs
9	1	1	1	-	43	0.144	0.155	0.926	drs
10	0.21	0.273	0.769	drs	44	1	1	1	-
11	1	1	1	-	45	0.254	0.274	0.929	drs
12	0.349	0.349	1	-	46	0.604	0.611	0.988	drs
13	0.374	0.53	0.704	drs	47	1	1	1	-
14	0.29	0.337	0.86	drs	48	0.17	0.234	0.728	drs
15	0.475	1	0.475	drs	49	0.387	0.421	0.919	drs
16	1	1	1	-	50	1	1	1	-
17	0.173	0.203	0.85	drs	51	0.28	0.304	0.92	drs
18	1	1	1	-	52	0.443	0.443	1	-
19	0.506	0.648	0.781	drs	53	0.171	0.22	0.776	drs
20	0.277	0.363	0.764	drs	54	0.258	0.274	0.942	drs
21	0.516	0.556	0.928	drs	55	0.297	0.329	0.902	drs
22	0.313	0.332	0.942	drs	56	0.39	0.637	0.612	drs
23	0.608	0.8	0.76	drs	57	0.343	0.345	0.994	drs
24	0.553	0.559	0.989	drs	58	0.29	0.305	0.952	drs
25	0.92	1	0.92	drs	59	0.5	0.507	0.987	drs
26	0.218	0.264	0.824	drs	60	0.105	0.107	0.985	drs
27	0.199	0.216	0.923	drs	61	1	1	1	-
28	0.205	0.308	0.666	drs	62	0.191	0.232	0.824	drs
29	1	1	1	-	63	0.132	0.14	0.948	drs
30	0.344	0.46	0.748	drs	64	1	1	1	-
31	0.417	0.492	0.847	drs	65	0.238	0.238	0.999	-
32	0.161	0.208	0.772	drs	66	0.537	0.87	0.617	drs
33	1	1	1	-	67	1	1	1	-
34	1	1	1	-	Average	0.488	0.551	0.879	-

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(1) On the whole, the average comprehensive efficiency of transformation and upgrading of private manufacturing industry is 0.488, the pure technical efficiency is 0.551, and the scale efficiency is 0.879. There are great differences in the structure, level and scale of resources allocation of fiscal and taxation policy input, among which the scale of investment is better, and the efficiency of the two is worse.

(2) The Scale efficiency is 0.879 greater than technical efficiency is 0.551. It shows that the scale of investment has approached the optimal boundary in the transformation and upgrading, but there are some problems in the structure of investment, such as mismatch or unreasonable resource utilization. Failure to fully optimize the allocation structure of fiscal and taxation policies may be related to the level of internal management of enterprises and can not fully enjoy fiscal and Taxation policies. From the efficiency point of view, the comprehensive efficiency value of transformation and upgrading of 13 enterprises is 1, which achieves DEA efficiency in pure technical efficiency and scale efficiency. It shows that the proportion of input and output of fiscal and taxation policies of these 13 enterprises in transformation and upgrading reaches the optimal level, accounting for only 19.4%, while that of 3, 15 and 25 enterprises achieves DEA efficiency in pure technical efficiency. The technical level of investment has reached the optimum level, but the scale efficiency is still insufficient. Most enterprises have not reached DEA efficiency in pure technology efficiency and scale efficiency, and may have a miscellaneous input or insufficient policy utilization efficiency.

(3) From the perspective of scale remuneration, all enterprises are DRS, mainly because there is a gap between fiscal and taxation policy input and the actual needs of enterprises. Although enterprises can enjoy the benefits of fiscal and taxation policy, they are still difficult to meet the support of transformation and upgrading, which makes it difficult to effectively utilize fiscal and taxation policies, leading to transformation. Type upgrade effect is reduced.

4.2 Measurement of incentive effect of fiscal and tax policies

On the basis of the C-D function model, take the logarithm of both sides and get the following transformation

$$\ln Y = \ln A(t) + a \ln T + b \ln G + c \ln E + d \ln F + \ln \mu$$

This paper takes the incentive effect of fiscal and taxation policies as the independent variable and the Transition &Upgrading efficiency of manufacturing industry as the dependent variable. On this basis, scientific and technological investment is added as the explanation intermediary to analyze the existing problems in the Transition &Upgrading efficiency of manufacturing industry. The analysis framework is shown in the figure 1.

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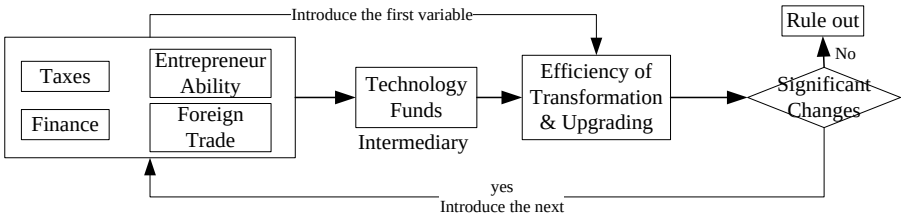

Fig 1. Analysis Framework

Eviews6.0 analysis was used to output the experimental results, and the significance of the process was basically stable when the variables were brought into it.At the significance level of 5%, tax policies, fiscal policies, entrepreneur education level and export delivery value have a certain impact on the efficiency of Transition &Upgrading, with a weak significance. However, some problems can still be illustrated from the analysis results, which are shown in table 3 below. The dependent variable is the Transition &Upgrading efficiency.

Table 3

	The explained variable is: Transition &Upgrading efficiency			
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.467573	1.704480	5.310327	0.0004
LNT	0.046462	0.008043	0.453338	0.0002
LNG	-0.231833	0.161313	-2.273386	0.0632
LNE	-0.187088	0.201735	-1.827396	0.3654
LNF	0.037361	0.042481	0.879477	0.3901
R-squared	0.645723		F-statistic	20.83104

As can be seen from table 3, the effects of tax policies, fiscal policies, entrepreneur level and foreign export trade on the Transition &Upgrading efficiency show some differences. Tax revenue is positively correlated with the Transition &Upgrading efficiency, but the correlation is not obvious. However, fiscal policy and entrepreneur level are negatively correlated with the Transition &Upgrading efficiency. Foreign trade is positively correlated with the Transition &Upgrading efficiency, and the correlation coefficient is low.

Tax policy is a results-oriented incentive measure to encourage more private manufacturing industry to invest in research and development, improve management quality and optimize business model in the Transition &Upgrading. For example, preferential tax policies for high-tech enterprises are more likely to guide enterprises to adopt a high-quality and internal growth model, so that enterprises are more inclined to the quality and results of the Transition &Upgrading. In addition, tax incentives are reduced or exempted according to the cost ratio, which makes enterprises pay more attention to the improvement of input-output efficiency.

Fiscal policy is a planned stimulus measures, more is to plan and eligible

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enterprises to declare a monetary support. As for the private manufacturing industry, its capital elements are relatively limited, and in the case of fiscal subsidies, priority will be given to how to obtain government resources, so that enterprises invest more costs in the process of applying for government subsidies and pay insufficient attention to the effects and practical measures in the process of Transition &Upgrading. In addition, in the case of large financial subsidies, the government will increase the reporting requirements of enterprises for regulatory needs, resulting in more investment of institutional transaction costs for enterprises to obtain resources. In the case of less subsidies, enterprises may have opportunistic behaviors, focusing on how to obtain subsidies rather than the Transition &Upgrading itself.

The negative correlation between entrepreneurs' level and the efficiency of Transition &Upgrading does not mean that the higher entrepreneurs' educational background is, the more restrictive it is to the efficiency of Transition &Upgrading. Based on the in-depth analysis of entrepreneurs with high educational level in private manufacturing industry, most of China's private manufacturing industry is in the transition from the first generation to the second generation. Most of the highly educated are the second-generation leaders of family-oriented enterprises, with good education level, good vision and modern management philosophy. However, due to the lack of industry experience accumulation, enterprises are more willing to invest resources in Transition &Upgrading, and lack of sufficient cognition on the development rules of enterprises, resulting in the general input-output efficiency.

Foreign trade shows a positive correlation, indicating that exporting to developed regions can promote the Transition &Upgrading efficiency of enterprises in terms of products and brands. Higher standards and certifications in developed regions put forward higher requirements for private manufacturing industry in terms of technology and quality, as well as the development orientation of enterprises in product research and development and market entry, which enables enterprises to clarify the direction of resource investment, optimize the investment structure and improve the efficiency in Transition &Upgrading.

4.3 intermediaries of fiscal and tax policy incentives

In order to further analyze the incentive mechanism of fiscal and taxation policies, the investment of scientific and technological funds was introduced as an intermediate explanatory variable to observe the impact of tax policies and fiscal policies on the investment of scientific and technological funds, so as to provide an intermediate explanation for the correlation between the two and upgrading efficiency. Using multiple regression, the analysis results are shown in table 4.

Table 4

	Explained variable: science and technology investment		
Variable	Coefficient	Std. Error	t-Statistic
C	10.80924	4.513345	1.394950
T	4.094164	1.733178	1.362229

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G	-3.134880	1.670180	-0.876970
R-squared	0.515723	F-statistic	12.153630

As can be seen from table 4, the influence of tax policies and fiscal policies on the input of science and technology funds is basically consistent with that on the efficiency of Transition &Upgrading, indicating that tax policies can positively influence the investment of enterprises in science and technology funds, and then act on the Transition &Upgrading to improve their efficiency. However, fiscal policies have a certain crowding out effect on the investment of science and technology funds. In the process of Transition &Upgrading, enterprises tend to obtain additional resources from the government to avoid risks and save costs, and the efficiency is not high, so it is difficult to "supervise" the effect of Transition &Upgrading.

5. Conclusion analysis and Suggestions

Through the survey and micro data analysis of 67 private manufacturing industries, I found that the overall Transition &Upgrading efficiency of manufacturing industry is low, and the impact of tax and fiscal policies on it is obviously different. The main reason for the low Transition &Upgrading efficiency is the low technical efficiency, which indicates that private manufacturing industry needs to improve the investment structure and internal management level, while the overall investment scale can solve the optimal efficiency. Tax and fiscal policies mainly affect the Transition &Upgrading efficiency through the influence of investment in science and technology. In addition, the level of entrepreneurs and foreign trade also have different impacts on the Transition &Upgrading. Therefore, the Transition &Upgrading of manufacturing industry can be improved from the following aspects.

(1) Increase tax policy

To expand the preferential power of tax policy, the income tax shall be deducted from the scientific and technological investment, product research and development, market development and other aspects in the Transition &Upgrading of private manufacturing industry, and the market effect of research and development shall be returned to encourage enterprises to commit to innovative and quality investment in the Transition &Upgrading. We will lower the threshold for enterprises to declare preferential tax treatment, and guide small and micro manufacturing industries to actively carry out Transition &Upgrading activities.

(2) Reduce or adjust fiscal policies

Change the original financial subsidy mode of plan declaration, integrate financial funds, and give certain rewards in the link of science and technology investment through the effect of Transition &Upgrading. For example, it provides certain support in patent application and protection, treatment of R&D personnel, and interest compensation in enterprise financing, so as to fundamentally improve the efficiency of the Transition &Upgrading of private manufacturing industry.

(3) Optimize the policy structure

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The government should pay attention to the correlation between policy structures, and the impact of Taxation and Finance on enterprises has a reverse relationship. In the implementation and formulation of policies, we should maintain the consistency of policy impact and avoid some policy failures. We should sort out the relationship between incremental policy and stock policy, and strive to form a combination of complementary relations between policies. Optimize the application scenario of policy incentives, clarify the actual needs of private manufacturing industry in transformation and upgrading, and improve the efficiency of fiscal and taxation policies in enterprises.

Acknowledgement

Foundation items: Philosophy and Social Science Planning of Zhejiang (19NDJC007Z) “The Impact of Institutional Cost on Low-end Locking-in of Private Manufacturing Industry and Its Countermeasures”, Sponsored by K.C.Wong Magna Fund in Ningbo University.

References

[1] Wang Delu, Zhang Mill, Zhou Min. Review of the Research on Technological Capability of Transitional Enterprises in Industrial Transition [J]. Journal of Management Sciences in China, 2006 (6): 74-80

[2] Wu Jiaxi, Li Huaxuan. Investigation report on transformation and upgrading of SMEs in Zhejiang Province [J]. Management World, 2009 (08): 1-59.

[3] Mao Yunshi, Zhang Weitao, Wei Shuyu. Enterprise transformation and upgrading: frontier field of management research in China [J]. Academic Research, 2015 (01): 72-82.

[4] Gereffi G.International Trade and Industrial Upgrading in the Apparel Commodity Chain”,Journal of Interna-tional Economics,1999(48):37~70.

[5]Poon. Beyond the Global Production Networks: a Case of Further Upgrading of Taiwan's Information Technology Industry, International Journal of Technology and Globalisation, 2004(01):130-144.

[6] Mao Yunshi, Wu Yao. Path of Enterprise Upgrading and Analysis Model [J]. Journal of Sun Yat-Sen University (Social Science Edition) 2009 (01): 178-186

[7] Mao Yunshi, Wang Jiezheng, Qizhi. Reconstructing Global Value Chain: A Frontier Field of Management Research in China [J]. Academic Research, 2015 (11): 85-93.

[8] Zhang Jie, Liu Zhibiao, Zheng Jianghuai. Research on the Key Influencing Factors of Innovation Activities of Manufacturing Enterprises in China-Based on the Analysis of Jiangsu Manufacturing Enterprises Questionnaire [J]. Management World, 2007 (06): 64-74

[9] Yang Guiju. Transformation and Upgrading of OEMs: A Theoretical Model of Evolution Path: A Case Study Based on Three Local Enterprises [J]. Management World, 2010 (6): 132-142

[10] Wang Jifa, Feng Jin and Li Hanling. Research on the connotation of enterprise transformation [J]. Statistics & Decision, 2006 (01): 153-157.

[11] Winter S G. The Satisficing Principle in Capability Learning [J].Strategic Management Journal, 2000(21):10-11:981-996.

[12] Gans J S,Stern S. The Product Market and the Market for “Ideas” [J]: Commercialization Strategies for Technology Entrepreneurs, Research Policy. 2003, 32 (2):333-350.

ISSN 2616-5902 Vol.2, Issue 1: 112-124, DOI: 10.25236/AJBM.2020.020112

[13] Jinbei. Transformation and Upgrading of China's Industry [J]. China Industrial Economics, 2011 (7): 14-25
[14] Kong Weijie. Research on the Influencing Factors of the Transformation and Upgrading of Manufacturing Enterprises [J]. Management World, 2012 (9): 120-131
[15] Wang Yuyan. Study on the Evaluation Index System of China's Enterprise Transformation and Upgrading Strategy [J]. Science & Technology Progress and Policy, 2014 (8): 123-127.
[16] Suo Jian, Li Xianjun, et al. Innovation Drive: Theoretical Logic and Path Design of SME Transition in China [J]. Business Management Journal, 2014 (9): 55-66.
[17] Cai Guowei, Shao Zhihao, et al. Organization and management structure, government public service and transformation and upgrading of private enterprises [J]. Finance & Trade Economics, 2015 (4): 46-59.
[18] Fang-Mei Tseng,Yu-Jing Chiu.Measuring Business Performance in the High－tech Manufacturing Industry: A Case Study of Taiwan's Large－sized TFI－LCD Panel Companles[J].Omega, 2009,37 (3):686-697.
[19] Yang Yi, Xue Huijuan. Study on the Regional Difference of Industrial Technology Independent Innovation Ability [J]. China Industrial Economics, 2011 (11): 68-76.
[20] Chen Hongchuan. Research on International Competitiveness Evaluation System of High-tech Industry [J]. Soft Science, 2008 (8): 114-117.
[21] Chakrabarti A K. Analysis of Patents of US, Japan ,UK, France West Germany and Canada Engineering Management[J]. Engineening Management IEEE Transactions on, 1991 (2): 78-84.
[22]Chung-Jen Chen,Hsueh-Liang Wu, Bou－Wen Lin. Evaluating the Development of High－tech Industries: Taiwan's Science Park[J]. Technological Forecasting and Social Change, 2006 (4):452-465.
[23] Bai Junhong, Jiang Keshen, Li Jing. Technological efficiency and technological progress of R&D and innovation in China [J]. Science Research Management, 2010 (6): 7-17.
[24] Li Peizhe, Kan Lirong, Liu Yong. Evaluation of Innovation Efficiency of Regional High-tech Industries Based on DEA and Malmquist Index [J]. Journal of Industrial Technological Economics, 2019 (1): 27-34.
[25] Wu Qiang, Liu Bei. Research on the mechanism of government R&D subsidy on innovation of strategic emerging industries [J]. Industrial Economics Research, 2014 (6): 41-49.
[26] Liu Guangqiang. Incentive Effect Analysis of Tax Preference and Fiscal Subsidy Policy - Empirical Study Based on Information Asymmetry Theory [J]. Management World, 2016 (10): 62-71.
[27] Chu Deyin, Jifan, Yang Shan. Financial Subsidies, Tax Preferences and Patent Output of Strategic Emerging Industries [J]. Taxation Research, 2017 (4): 99-104.
[28] Li Chunhao, Liu Yuguo and Li Hui. An improved CKS-DEA model with weight confidence region of qualitative factors is proposed. Chinese Journal of Management Science, 2003 (10): 33-37.