An Analysis on Performance Evaluation and Coordination Strategies of Transformation and Upgrading of Manufacturing Small and Micro Enterprises: An Empirical Study Based on AHP-Regression

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ABSTRACT
Transformation and upgrading are the key to the development of manufacturing industry.Through the questionnaire survey, we designed 17 observation indicators and used the Analytic Hierarchy Process(AHP) to calculate the two levels of transformation and upgrading, and found that small and micro enterprises paid most attention to internal management and industrial chain upgrading. When we using multiple regression analysis to analyze the impact of internal and external promotion strategies on transformation and upgrading, it is found that the combination strategy of assets, information management level and the overall quality of employees had the best effect, which is consistent with the most important transformation and upgrading indicators of enterprises.In terms of government support and tax policy promotion strategies, tax policy has a relatively good independent impact, but when combined with other indicators, the impact will not be significant. This shows that the conversion efficiency of the policy is low, and the applicability and pertinence need to be optimized. In addition, in terms of the promotion strategy of innovation input for transformation and upgrading, the effect is not good, indicating that the innovation efficiency of Chinese small and micro enterprises is not high, and the ability to transform innovation resources into innovation output is insufficient. This has also formed evidence support for internal management indicators in transformation and upgrading.

Keywords: Small micro enterprises; Transformation and upgrading; Coordination; AHP; Multiple regression.
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Introduction

In China, small and micro enterprises, all of which refer to industrial manufacturing enterprises in this paper, continue to flourish, and they have made great contributions to the growth of national economy, the promotion of employment, and the increase of tax revenue. However, China' s small and micro enterprises rely on resource input for a long time, and the economic leading model characterized by "high consumption, low quality and low efficiency" will not be sustainable. The Chinese government actively promotes small and micro transformation and upgrading and encourages the use of new technologies and methods for transformation and upgrading.

Transformation and upgrading has been a reform actively promoted by the Chinese government in recent years.In terms of industrial policy, the Chinese government not only gives great concessions in taxes and fees, but also continues to strengthen subsidies for some R&D investment. However, some characteristics of small and micro enterprises make the implementation of relevant policies inconsistent with expectations. For example, in fixed assets, foreign trade, R&D and training support policies, its results show significant differences. How to assess the effectiveness of these measures requires adequate investigation and analysis.

Transformation and upgrading is a macro concept, including rich and diverse content. In different research, its concept subject also has the big difference. Looking at the research in recent years, it is found that the connotation of enterprise transformation and upgrading includes two levels: enterprise transformation and enterprise upgrading [1].The difference in connotation between transformation and upgrading is also different in sensitivity to actual factors. Therefore, in the analysis of small and micro-enterprise transformation and upgrading factors, should be classified research.

In the strategy research of promoting transformation and upgrading, the existing related research results are based on the empirical analysis of the potential factors of transformation and upgrading.For example, taking innovative products, patent number and so on as the object of analysis, it is difficult to cover the connotation of transformation and upgrading, and cannot design the effective means of transformation and upgrading from a systematic perspective, which has a certain one-sidedness. Therefore, it is necessary to solve the problem of transformation and upgrading evaluation system when analyzing the promotion strategy of small and micro enterprises transformation and upgrading.This paper starts from the connotation system of transformation and upgrading, constructs the evaluation index which includes two levels of transformation and upgrading, and then classifies the data to demonstrate. Through deep data analysis, this paper will explore the relationship between different promotion, incentive methods and transformation and upgrading system, so as to design a more effective coordination strategy to promote the transformation and upgrading of small and micro enterprises.

There are five parts in this paper; the first part is a general introduction of online English teaching mode. The second part presents the researches and comments on online English teaching mode at home and abroad. The third part is the research design, including research questions, research participants and research instruments. Then the data will be collected and analyzed through the questionnaire made in Jishigang Primary School Ningbo. The fourth part discusses the benefits and problems of online English teaching mode according to the data and put forward several solutions. The last part is the conclusion of the whole paper.

The rest of this paper is arranged as follows. Firstly, the second part reviews the literature and research hypothesis. Secondly, the third part is research design. Thirdly, the data empirical analysis and results are carried out in the fourth part. Finally, the fifth part is discussion analysis and suggestion.

Literature Review and Research Hypotheses

Enterprise Transformation and Upgrading

Wu Jiaxi et al(2009) [2] believed that there were two main aspects of enterprise transformation. First, the transformation of enterprises in different industries or different fields. Second, organizational management level transformation, which mainly refers to the optimization of internal management model. Poon(2004) [3] considered that enterprise upgrading refered to the process of improving its competitive ability from low end to high end by obtaining technical ability or market ability. Wang Jifa et al.(2006) [4] believed that enterprise transformation refered to the organizational change of enterprises to enhance the competitiveness of the industry. Jinbei (2011) [5] believed that enterprise transformation and upgrading was a process involving profound and systematic changes in technology, system, concept and so on, in which the ability of independent innovation of enterprises was the most critical factor of transformation and upgrading.

Bibeault(1982) [6] considered that the transformation of enterprises should include five kinds, including enterprise management mode, enterprise business operation mode, enterprise adaptation to external environment, product innovation and related to government policy. Gereffi(1999) [7] summarized the upgrading path model from commissioned assembly, commissioned processing, autonomous design and processing to autonomous brand production according to the evolution process of garment production enterprises in East Asia in the global value chain. Mao Yunshi and Wu Yao (2009) [8] believed that enterprise upgrading should be the upgrading process of new products, new services, new brands and new markets based on the promotion of enterprise ability and value. Yang Guiju (2010) [9] proposed a theoretical model to OEM the path of enterprise transformation and upgrading by case analysis. Fu Zhengping and Peng Wei (2011) [10] believed that enterprise upgrading included four kinds of upgrading. Firstly, process. Secondly, product. Thirdly, function. Forthly, industrial chain. Wang Yuyan (2014) [11] thought that the transformation and upgrading of Chinese enterprises should highlight the six key objectives of economic benefit, technological innovation, quality brand, structure optimization, intelligence rate, green drive and so on.

Based on the above literature, this paper holds that the transformation and upgrading of manufacturing industry includes two levels, enterprise scale, innovation ability and product upgrading, as well as market, management ability and industry transformation.

Strategies for Transition and Upgrading

With the deepening of the research on enterprise transformation and upgrading, more and more scholars began to pay attention to the direct impact of enterprise micro-level indicators on transformation and upgrading. Winter(2000) [12] believed that enterprising and innovative corporate culture and entrepreneurial innovation spirit were important factors for enterprise transformation and upgrading. Moreover, Gans and Stern(2003), as well as Vergrat and Brown (2006) believed that government support was an effective means for enterprises to quickly achieve transformation and upgrading. Besides[12], Wang Jifa et al.(2006) [4] thought that enterprise transformation was the result of the comprehensive action of endogenous motivation and external vivid cause. Additionally, Kong Weijie (2012) [13] believed that enterprise innovation had a greater positive role in promoting transformation and upgrading. However, the main driving force of China's manufacturing industry in transformation and upgrading came from the quality and environment certification and technical barriers in foreign trade (Mao Yunshi, 2010) [14].

From the basic theory of resources, the motivation source of enterprise transformation and upgrading was its internal. Enterprises could gain competitive advantage by allocating its valuable, scarce and imitative resources (Barney, 1991). The possession of key resources and acquisition of key capabilities laid a foundation for enterprise transformation and upgrading (Makadok, 2001).

Key resources include capital accumulation and human resources.[15][16] The key capabilities of enterprises include independent innovation capability and marketing service capability. [17][18]

From the perspective of contingency theory, the motivation source of enterprise transformation and upgrading is its external. On the one hand, the market prospect is broad, the consumption psychology is maturing day by day, the market competition order is becoming more and more standardized, which provides a broad external space for the enterprise to upgrade. The government vigorously creates a good external environment for technological innovation, which is conducive to promoting the rapid upgrading of enterprises. [19] On the other hand, entrepreneurship and brand awareness can accelerate the process of establishing independent brands.Enterprise ambition is an important factor affecting the transformation and upgrading of enterprises, while enterprise ambition is an external manifestation of entrepreneurship and corporate culture. [20] It also includes innovative, aggressive, passionate and persistent entrepreneurship, strong sense of responsibility to people and employees, strong independent intellectual property rights and brand awareness, and different influence on enterprises to choose different transformation and upgrading paths. [21][22]

Policy incentive will guide the enthusiasm and initiative of enterprise transformation and upgrading; [23][24] tax preferential policy can better induce technological innovation; [25][26] policy incentive intensity is not linearly related to enterprise performance[27]. Tax and government R&D policy fluctuations will have a certain negative inhibitory effect. [28] A variety of strategic combinations of policy incentives, [29][30] with better pertinence and balance. [31][32][33]

Based on this, this paper believes that the factors that promote the transformation and upgrading of the manufacturing industry are composed of internal and external factors, including the size of the enterprise itself, R&D investment, the management level of entrepreneurs and the support of government fiscal and taxation policies.

To sum up, the current research mainly takes enterprise transformation and upgrading as two aspects of internal management and external competition from the perspective of competitiveness and industrial chain theory. However, there is a lack of quantitative design in the current research on the design of observation indicators at the specific micro level, and the weight of the indicators is not measured, so it is difficult to quantitatively analyze the transformation and upgrading status of the manufacturing industry. In the study of motivation, most literatures make empirical analysis of a certain sector of transformation and upgrading based on a one-way index, but lack the analysis of coordination effect under the combination of internal and external factors. The main contribution of this paper lies in the establishment of a micro measurement index system for transformation and upgrading through the investigation of small and micro manufacturing enterprises, and the promotion of transformation and upgrading through the coordinated combination analysis of internal and external factors.

Research Design

Data Sample collection

This paper took manufacturing small and micro enterprises as the research object, selected Zhejiang Province as the sample area, and did the investigation from 2018 to 2019. In accordance with the criteria for the classification of enterprises in the Law of the People' s Republic of China on the Promotion of Small and Medium-sized Enterprises and the Opinions of the State Council on Further Promoting the Development of Small and Medium-sized Enterprises, this paper selected enterprises with less than 100 employees or operating income of less than 40 million yuan as the research object, and finally the research obtained a total of 321 samples.

Transformation and Upgrading Evaluation Index System

According to the hypothesis above, the transformation and upgrading of small and micro manufacturing enterprises should be evaluated comprehensively from the two aspects of transformation and upgrading. According to the feedback from the questionnaire, in terms of upgrading, enterprises consider scale, product and innovation ability to be the most reflected indicators, accounting for 33%, 31% and 29% respectively. In terms of transformation, enterprises believe that the most visible indicators are market, management and industry, accounting for 28%, 26% and 23% respectively. Accordingly, an overall evaluation system for the transformation and upgrading of small and micro manufacturing enterprises was constructed. Considering the needs of subsequent data analysis, 17 measurement points were designed for each of the 6 indicators to provide data support for quantitative analysis. The details are shown in figure 1.

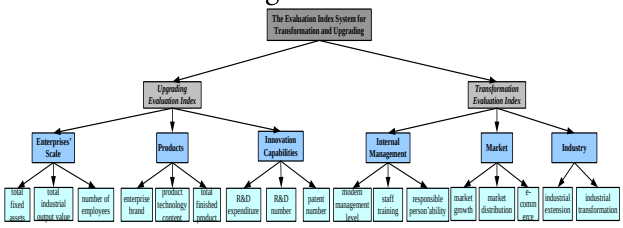

Figure 1 Evaluation Index System for Transformation and Upgrade

The scale of small and micro enterprises is the main embodiment of enterprise upgrading. The scale of small and micro enterprises is the main bottleneck of its development, and the scale of cost allocation, R&D investment and so on is the main influencing factor. To this end, the state and provinces and cities issued a series of measures to promote the upgrading of small and micro enterprises. The evaluation index of enterprise scale mainly includes total fixed assets, total industrial output value and number of employees.

Products are the foundation of the development of small and micro enterprises. The brand, technology content and quality of the product are the main influencing factors of its marke t competitiveness, the guarantee of enterprise upgrading, and the important link of differential competition of small and micro enterprises. Product evaluation indicators mainly include enterprise brand, product technology content and total finished product.

Innovation ability is the key link of small and micro enterprise transformation and upgrading. Small and micro enterprises in the market competition product competitiveness, mainly rely on its innovation ability to promote. In order to promote the upgrading of its products, this is also a key bottleneck for small and micro enterprises. The evaluation index of innovation ability mainly includes R&D expenditure, R & D number and patent number.

Market is the reflection of the level of small and micro enterprise value chain. The market occupied by small and micro enterprise products is the comprehensive embodiment of its product brand, technology and quality, and also the direct influence factor of small and micro enterprise profits. In addition, the market development mainly lies in the domestic market, the international market and the electronic commerce market. Market evaluation indicators are market growth, market distribution, e-commerce.

Internal management is the source of the transformation of small and micro enterprises. Most of the management of small and micro enterprises is loose and random, so it is necessary to highlight the application of new technology, new tools and new ideas. At the same time, the overall quality of small and micro enterprises is low, management is mainly responsible for subjective decisions. The main evaluation indexes of modern management level, staff training and management ability of responsible person.

Industry is one of the important ways to transform small and micro enterprises. Through the development of the original industry, small and micro enterprises extend to upstream or downstream industries, or infiltrate into other emerging characteristic industries, and then enhance the maximization of the overall value

chain effect of enterprises, which is the highest requirement for the transformation of small and micro enterprises. The evaluation index of industry mainly includes industrial extension and industrial transformation.

Weight Measurement of the Transition and Upgrading Evaluation System

Above for manufacturing small and micro-enterprises transformation and upgrading to build a top-down hierarchical evaluation system. However, the degree of reflection of each index in the enterprise transformation and upgrading system is different.The importance of different indicators in the transformation and upgrading system is also different. The transformation and upgrading index obtained through the questionnaire can only express a general tendency of the enterprise.However, the importance relationship between indicators can not be determined, so it is necessary to further analyze the weight value of each index in the transformation and upgrading, which can reflect the scientific nature of the evaluation system.

Analytic hierarchy process is to decompose complex problems step by step to form a multi-level structure.The weight coefficient of each index is an important analysis tool of decision theory. Hierarchical analysis method can present the relationship of importance between multiple factors in numerical form, and has the advantage of quantifying qualitative problems. Therefore, it is necessary to construct a three-tier evaluation system. The first level is the overall goal of small and micro enterprise transformation and upgrading "A". The second level consists of six criterion layers, Enterprise size "B1", product "B2", innovation capability "B3", market "B4", internal management "B5", industry "B6". The third layer contains 17 indicators in the 6 criteria layer. The details are shown in figure 1.

Coordination Strategy Design for Transition and Upgrading

According to the existing literature, the strategies of transformation and upgrading come from inside and outside. Internal to their own enterprise input as the main body, external to market relations, government policies. Therefore, the coordination of transformation and upgrading should be combined from both internal and external levels. In this paper, a multivariate regression model is designed to evaluate the performance of transformation and upgrading as dependent variables. The factors such as internal input and external incentive are selected as independent variables, and the promotion effect of strategies on transformation and upgrading under different combinations is analyzed in order to obtain a set of best effect combinations.

Data Empirical Analysis and Results

Performance evaluation of transformation and upgrading

Building JudgementMatrices.The relative importance of each factor at each level is expressed in numerical form. For example, u_{ij}Expressionofu_i and u_j(i,j=1,2,3...). The relative importance, take 1,2,3...If u, then u_j per cent$_i$Important, then expressed by countdown, as shown in Table 1.

Table 1 Numerical Description of the JudgementMatrix

Value	Note
1	Representation of two indicators is equally important
3	The former factor is slightly more important than the latter
5	The former is more important than the latter
7	The former is more important than the latter
9	The former is more important than the latter
2、4、6、8	Median value between 1,3,5,7,9

Countdown	The former is important

According to the above instructions, the following judgment U, are

constructed $U = \begin{bmatrix} u_{11} & u_{12} & \text{K} & u_{ij} \\ u_{12} & u_{22} & \Lambda & u_{2j} \\ \text{M} & \text{M} & \text{M} & \text{M} \\ u_{i1} & u_{i2} & \Lambda & u_{ij} \end{bmatrix}$

The values in the matrix are scored by expert Delphi method. In order to ensure the scientific and accurate scoring, the author has visited 12 experts from government, enterprises and other institutions. Through the proposed questionnaire, this paper quantifies the experience of managers and consults with expert group members in accordance with established procedures.Members of the Group submitted their comments anonymously. After two rounds of consultation and feedback, the opinions of the members of the expert group gradually tend to be stable, and the questions are not objective and the logical questions are removed. Finally, 5 bits of collective judgment with high accuracy are obtained, and the judgment matrix is constructed.

Single Layer Weight Ranking and Consistency Test.The weight of each layer is calculated according to the judgment matrix. The importance of the related indexes at this level can be transformed into the calculation of the corresponding matrix eigenvalues and eigenvectors, and the normalized eigenvectors are taken as the weights of the indexes in this layer relative to the upper layer. Because of the uncertainty, the judgment matrix needs to be checked for consistency. When the consistency index of the judgment matrix is less than 0.1, it shows that the matrix has satisfactory consistency, otherwise it is necessary to adjust the matrix index.

Firstly, for the overall target of small and micro enterprise transformation and upgrading, the relative importance of the six criteria is calculated in table 2 below.

Table 2 Ranking Weights B the Target Layer A in the Criterion Layer

Evaluation indicators for transition upgrading	Enterprise Scale	Products	Innovation Capacity	Market	Internal management	Industry	Weight
Enterprise size	1.0000	0.3674	0.2508	0.6084	0.1581	0.2682	0.0493
Products	2.7216	1.0000	0.7248	2.0626	0.3749	0.5818	0.1313
Innovative capacity	3.9874	1.3797	1.0000	1.9744	0.3081	0.6646	0.1546
Market	1.6438	0.4848	0.5065	1.0000	0.2088	0.3155	0.0732
Internal management	6.3253	2.6673	3.2453	4.7894	1.0000	1.8384	0.3778
Industry	3.7279	1.7188	1.5047	3.1698	0.5439	1.0000	0.2138

$\lambda_{\max}$ $C \cdot I$ $C \cdot R$ =6.0481, =0.00962, =0.0076<0.1

Secondly, for enterprise size, the weights among the indicators are calculated in table 3 below.

Table 3 Ranking Weights of Index Layer B1 Criterion Layer

Enterprise scale B1	Fixed assets	Industrial GDP	Number of employees	Weight
Fixed assets	1.0000	0.8219	0.5957	0.2538
Industrial GDP	1.2167	1.0000	0.5743	0.2858
Number of employees	1.6788	1.7411	1.0000	0.4604

λ_{max} $C \cdot R$ =3.0060, =0.0058<0.1

Thirdly, for products, the direct weight of each indicator is calculated in table 4 below.

Table 4 Ranking Weights of Indicator Layer B2 Criterion Layer

Products B2	Corporate brand	Technical content	Number of finished products	Weight
Corporate brand	1.0000	0.6310	1.9855	0.3180
Technical content	1.5849	1.0000	3.6502	0.5296
Number of finished products	0.5037	0.2740	1.0000	0.1524

λ_{max} $C \cdot R$ =3.0024, =0.0024<0.1

Forthly, for innovation capacity, the direct weight of each indicator is calculated in table 5 below.

Table 5 Ranking Weights of Indicator Layer B3 Criterion Layer

Innovative capacity B3	R&D expenditure	R&D	Patent	Weight
R&D expenditure	1.0000	0.6683	0.1616	0.1214
R&D	3.1777	1.0000	0.3309	0.2017
Patent	6.1879	3.0219	1.0000	0.6768

λ_{max} $C \cdot R$ =3.0109, =0.0105<0.1

Fifthly, for the market, the direct weight of each indicator is calculated in table 6 below.

Table 6 Ranking Weights of Indicator Layer B4 Criterion Layer

Market B4	Market growth	Market distribution	E-commerce	Weight
Market growth	1.0000	0.3147	0.2881	0.1298

Market distribution	3.1777	1.0000	0.6988	0.3771
E-commerce	3.4713	1.4310	1.0000	0.4931

λ_{max} $C \cdot R$ =3.0081, =0.0078<0.1

Sixthly, for internal management, the direct weights of the indicators are calculated in table 7 below.

Table 7 Ranking Weights of Indicator Layer B5 Criterion Layer

Internal management B5	**Modern management**	**Staff training**	**Management ability of responsible person**	**Weight**
Modern management	1.0000	0.5000	0.8415	0.2433
Staff training	2.0000	1.0000	1.1404	0.4274
Management ability of responsible person	1.1884	0.8769	1.0000	0.3292

λ_{max} $C \cdot R$ =3.0169, =0.0162<0.1

Seventhly, for industry, the direct weight of each indicator is calculated in table 8 below.

Table 8 Ranking Weights of Index Layer B6 Criterion Layer

Industry B6	**Industrial extension**	**Industrial transformation**	**Weight**
Industrial extension	1.0000	0.8027	0.4453
Industrial transformation	1.2457	1.0000	0.5547

λ_{max} $C \cdot R$ =2.0000, =0.0000<0.1

According to the calculation results of the above judgment matrix, all matrices pass the consistency test, which shows that each weight index has satisfactory consistency.

Total Ranking of Final Weights.The total ranking needs to be carried out from top to bottom.First, the vector values of 6 criterion layers, product, innovation ability, market, internal management and industry are calculated.Then the weight value relative to the total target is obtained by multiplying the vector value of the fixed assets, the total industrial output value and the number of employees.The weight value of product, innovation ability, market, internal management and industry index relative to the total target is calculated.The results are shown in Table 9.

Table 9 Summary Table

General	**Level 1**	**Weight**	**Level 2**	**DS_i**	**Weight**	**Relative weight**
DS Evaluation Index System for	**B1: Enterprise size**	0.0493	Fixed assets	488	0.4604	0.0227
			Industrial GDP	480	0.5957	0.0125
			Number of employees	511	0.5743	0.0141

Transformation and Upgrade	**B2: Products**	0.1313	Corporate brand	73	0.3180	0.0418
			Product technical	155	0.5296	0.0696
			Gross product	409	0.1524	0.0200
	B3: Innovative capacity	0.1546	R&D expenditure	147	0.1214	0.0188
			R&D number	25	0.2017	0.0312
			Number of patents	122	0.6768	0.1047
	B4: Market	0.0732	Market growth	233	0.1298	0.0095
			Market distribution	127	0.3771	0.0276
			E-commerce	35	0.4931	0.0361
	B5: Internal management	0.3778	Modern management	501	0.2433	0.0919
			Staff training	156	0.4274	0.1615
			Management ability of responsible person	307	0.3292	0.1244
	B6: Industry	0.2138	Industrial extension	60	0.4453	0.0952
			Industrial transformation	40	0.5547	0.1186

Table 9 shows that the impact of small and micro-enterprise transformation and upgrading evaluation system to establish a sound impact factors.The influencing factors are in order of importance: employee training, responsible person's education level, industry transformation, patent number, industry extension, information level, product technology content, enterprise brand, e-commerce, R&D number, export destination, fixed assets, total finished product value, R&D expenditure, number of employees, total industrial output value, export delivery value.

For the overall goal of enterprise transformation and upgrading, most enterprises and experts think that we should pay more attention to internal management, followed by the expansion and extension of industry, and third, innovation ability and products.It may be that the internal management of small and micro enterprises is the primary problem of their survival and development, as well as the guarantee of innovation and products. There are many cases of decision-making errors, which is one of the most important evaluation factors for enterprises and experts.

The first three are employee training, responsible person level and industry transformation, and the results are consistent with those of the criterion level.The results show that small and micro enterprises need to solve the talent problem first. Talent is the core element of enterprise internal management.The transformation and upgrading of small and micro enterprises can only be promoted by talents. Therefore, strengthening staff training and improving the education level of enterprise leaders is the key to enhance the transformation and upgrading of small and micro enterprises.

Coordinated Strategies for the Transformation and Upgrading

Through AHP analysis, internal management has become the most important link of enterprise transformation and upgrading.However, the impact of enterprises' contribution to

transformation and upgrading in the actual operation process needs to be further tested by quantitative methods.Therefore, through collecting 321 small and micro enterprise survey data and combining 2018-2019 statistical panel data, this paper uses multiple regression method to analyze the impact of transformation and upgrading.

Measurement of Transformation and Upgrading of Dependent Variables.Based on the hierarchical analysis method to obtain the weight of each index of transformation and upgrading, this paper quantitatively calculates the transformation and upgrading, and sets each observation index of transformation and upgrading as the DS_i.The weight value of each index calculated by AHP.$W_i$and then through the weighted average method summary calculation of the overall transformation and upgrading value DS. ObtainedFor each transformation or upgrade, the enterprise can get 1 point and 0 point. For the transformation or upgrading of non-divariate variables, this paper will score the average value of variables in stages. Each micro index transformation upgrade value DS calculation formula is as follows:

$$DS = \sum_{i=1}^{n} W_i DS_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

We select 12 industry experts to score, including 6 government departments and 6 enterprise experts. There are 6 production managers, technical supervisors and business operations managers. At the same time, this paper combines the two aspects of enterprise transformation and upgrading, set up three groups: enterprise transformation, enterprise upgrading and enterprise transformation and upgrading.

In order to reduce the error caused by the data unit, the qualitative evaluation method of grade division is selected.Among them, electronic commerce adopts qualitative index (dummy variable), bring directly into calculation.Staff training is calculated by hierarchical weighted average.The responsible personmanagement ability, mode rn management, industry extension, industry transformation, enterprise brand and product technology content are assigned according to questionnaire enterprise self-evaluation opinions.The remaining indicators are divided by 6 grades and assigned by 0~6 points. Grading results are shown in the DS_i column in Table 9.

Independent Variable Setting.The selection of independent variables in this paper starts from the transformation and upgrading performance evaluation system. We select the strategic factors that pay more attention to the performance evaluation of transformation and upgrading.Considering the independence of independent variables and dependent variables, we try to select objective indicators.In the enterprise internal input, the enterprise mainly to asset investment, science & technology investment.The enterprise management ability, the information application level, the employee quality and the enterprise responsible person degree of education are the important influence factors which affect the management efficiency. In the external influence strategy, the dual influence of the market and the government is the main. The export-oriented economic characteristics of small and micro enterprises in Zhejiang are remarkable, so export trade and export market are regarded as market factors. The government chooses the tax reduction and fee reduction policy which the Chinese government actively implements at present, and takes the financial support and the preferential enjoyment of taxes and fees as the influencing factors.

Model Selection and Analysis.In this paper, the metrological model is set as a multivariate linear regression model. The models are as follows.

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_k x_k \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

The β is a fixed value, x represents the selected independent variables.We select export delivery value(JH), export destination(CK), fixed assets(ZC), information management level(GL), the overall quality of employees(SZ), education background of enterprise leader (XL), science &

technology investment(TF), tax concessions(SF) and financial support(CZ) as independent variables. We take transformation value DS_A, upgrade value DS_B, transformation upgrade value as dependent variables. The regression test coefficient is tested in Table 10 below.

Table 10 Multi-Multiple Linear Regression Coefficient Table

Model	1	2	3	4	5	6
Dependent variables	DS_A	DS_A	DS_A	DS_A	DS_A	DS_A
Constant term	2.357 .122()*** *	2.271 .221()*** *	1.041 .290()*** *	2.537 .186()*** *	2.434 .104()***	1.095 .358()***
JH	-.010 ().085					-.004 ().082
CK	.292 ().181					.170 ().177
ZC		.063 .063()**				.008 .061()**
GL			.195 .060()*** *			.178 .063()**
SZ			.334 .103()*** *			.345 .106()***
XL			.171 .095()*			.181 .099()*
SF				.052 ().078		-.010 ().076
CZ				-.111 ().087		-.046 ().084
TF					.132 ().150	-.074 ().148
R2	.009	.000	.121	-.002	-.001	.106
F	2.014	1.006	10.989	.821	.769	3.862

Continuation of table 10

Model	7	8	9	10	11	12	13
Dependent variables	DS_B	DS_B	DS_B	DS_B	DS_B	DS_B	DS
Constant term	2.908 ().165	3.070 .301()*** *	.913 .386()*** *	2.883 .253()*** *	2.990 .139()*** *	.894 .468()*	1.816 (.690)*** *
JH	.075 ().114					.036 ().108	-.061 ().159

CK	.395 ().244					.287 ().231	.708 .341()* *
ZC		.030 .086()* *				.076 .080()**	.132 .118()* *
GL			.274 .080()* **			.237 .083()** *	.195 (.062)* **
SZ			.530 .137()* **			.519 .139()** *	.874 .204()* **
XL			.292 .127()* *			.251 .130()*	.344 .191()*
SF				.180 .106()*		.054 ().100	-.029 ().147
CZ				-.060 ().118		.043 ().110	.068 ().162
TF					.638 .200()* **	.327 .194()*	.373 ().286
R2	.025	-.004	.158	.004	.041	.170	.143
F	3.749	.120	14.634	1.487	10.224	5.944	5.944

Note: The data in brackets in the table are standard deviation of regression coefficients ;***,**,* represent significant levels of 1%,5% and 10%, respectively

Discussion of Results

From the perspective of enterprise internal management, the results of classification model show that the level of information management, the overall quality of employees and the educational background of enterprise leaders are consistent, regardless of the enterprise transformation group or the enterprise upgrading group. The regression coefficients are significantly positive in all the grouping models, which reflects that the internal management of enterprises has a significant positive effect on enterprise transformation or enterprise upgrading. This further illustrates the importance of internal management in the transformation and upgrading of enterprises. Only the better the internal management, the better the transformation and upgrading of enterprises can be realized, and intern al management is the fundamental of enterprise transformation and upgrading.

Observing the results of the classification model from the perspective of enterprise fixed asset investment, whether it is enterprise transformation grouping or enterprise upgrading grouping, the regression coefficients of fixed assets are significantly positive in all grouping models. This shows that the investment in fixed assets of enterprises has a significant role in promoting transformation and upgrading. This further illustrates the importance of corporate fixed assets in promoting transformation and upgrading.

From the perspective of foreign trade, the results of the classification model show that export destinations play a significant role in the transformation and upgrading of small and micro enterprises. Model 13 undoubtedly confirms this point, but the effect of export delivery value similar

to the previous results on enterprise transformation and upgrading is not clear. Enterprises rely solely on export quantity expansion is not conducive to the transformation and upgrading of enterprises, and may even have negative effects. However, export-developed areas are conducive to promoting the transformation and upgrading of enterprises, so small and micro enterprises should pay more attention to the export of high-tech and high-content products.

Observing the results of the classification model from the perspective of corporate innovation, corporate R&D expenditures have positive and negative variables in the model of corporate transformation and transformation and upgrading, and they are not significant. This shows that the innovation investment effect of enterprises is not very good, which may be due to the speculative behavior of enterprises under the influence of government financial support. However, it is significant in Model 10 and Model 12 for enterprise upgrading, which shows that enterprise innovation has certain help to enterprise upgrading.

In terms of the effect of government behavior, the results show that government financial support has positive and negative variables in the model of enterprise transformation, upgrading, and transformation and upgrading, and they are not significant. Tax reduction and exemption have positive and negative variables in the model of enterprise transformation and transformation and upgrading, and they are both insignificant, while in the model 10 of enterprise upgrading, the tax concessions are significant. This shows that tax reduction and exemption have a certain role in promoting the upgrading of enterprises. Tax incentives generally take the form of laws and regulations. The implementation cost is low and the effect is wide. This can reasonably reduce the cost of technological innovation and other aspects, enhance the initiative of enterprises in transformation and upgrading, and thus affect the speed of transformation and upgrading. Although it is not obvious from the numerical point of view, the role of confidence in the transformation and upgrading of enterprises is beyond doubt.

Coordination Strategy Analysis.From the perspective of the classification model, at the two levels of transformation and upgrading, the combination of fixed assets, information management level and the overall quality of employees is the best effect of promoting transformation and upgrading. As an independent variable, R&D expenditure has a significant effect on upgrading, but the combined effect with other strategies is not significant. This indicates that R&D expenditure is highly sensitive and lacks robustness. The efficiency of R&D investment of enterprises is not high.

Although the strategic combination of government support and preferential tax and fee promotion has no significant effect, independent variables of tax and fee incentives are significant to the upgrading of enterprises. It shows that the tax and fee policy is being upgraded in the enterprise, which has a good impetus for the increase of R&D expenditure.

Research Conclusion

Internal Management Has Become the Primary Issue in the Transformation and Upgrading of Small and Micro Enterprises

From the research results, whether from the evaluation index system or from the empirical data test, internal management has become the primary factor affecting the transformation and upgrading of small and micro enterprises. Most of the small and micro enterprises are in the initial stage of enterprise development, and tend to pay more attention to the development of products and markets. Under the background of mass entrepreneurship and innovation, internal management is the foundation and guarantee of continuous product innovation and market development.

Throughout the current companies with strong vitality, good transformation and development, and good product innovation enterprises, most of them have good teams,

scientific organizational culture, and strong entrepreneurs. These have become the endogenous force of sustainable innovation and development of enterprises. Therefore, if small and micro enterprises want to maintain healthy development and stimulate innovation vitality, they must establish a good internal management mechanism and create an innovative environment. This will enable employees to maintain a sense of innovation at all times in their work, so that enterprises continue to emerge innovation in products, processes and other links, and promote the transformation and upgrading of small and micro enterprises.

In addition, small and micro enterprises should pay attention to the cultivation and improvement of entrepreneurship. Most small and micro entrepreneurs lack accumulation in leadership and industry experience, so they need to broaden their horizons, actively absorb the application of new technologies and tools, and adopt modern management methods. In order to ensure the standard and orderly internal management of the enterprise, and improve management efficiency and scientific decision-making.

Innovation Has Become the Main Bottleneck for the Transformation and Upgrading of Small and Micro Enterprises.

The survey found that only 70 small and micro enterprises have R&D expenditures, accounting for 18.51% of the surveyed enterprises. This shows that small and micro enterprises are extremely deficient in investment in innovation and insufficient in taking innovation risks. Innovation is a link that requires high investment, uncertain returns, and high risks. For small and micro enterprises in the early stages of development, survival is the top priority.

The direct impact of survival is the market. If the initial product technology of small and micro enterprises is not high and the added value is low, they will face the situation of competing in the market at low prices. Low prices will bring low profits, and low profits will bring insufficient investment in innovation. In turn, only further lower prices can fight for the market, which leads to a vicious circle. The only way to break this circle is innovation. Therefore, the government should do a good job in supporting the innovation investment of small and micro enterprises. Pure financial subsidies and tax reduction and exemption have limited impact on the innovation of small and micro enterprises. This has something to do with the speculative behavior of small and micro businesses. The cost saving is not enough to apply the expenditure of innovation, which results in the low support effect. The recent sme Development Fund has helped to improve this process. The government should act more as an intermediary, purchase innovation patents, and share the innovation risks of small and micro businesses. Or let the market choose the real investment in innovation small and micro enterprises, and then carry out key support.

Investment in Fixed Assets Remains a Major Driver of Small and Micro Enterprise Upgrading

The investment of fixed assets is remarkable for the transformation and upgrading of small and micro enterprises. The increase of advanced equipment investment will inevitably bring about the process and the improvement of production efficiency, thus improving the economic benefit. However, after a certain amount of investment, the effect of transformation and upgrading will be reduced, which indicates that the endogenous innovation power of small and micro enterprises is insufficient, and the development of new equipment and new technology needs to be absorbed and innovated in order to maintain sustainable development. In the survey, it was found that many small and micro enterprises lacked risk control over investment in fixed assets. They are generally relatively conservative, and usually require certain market opportunities, such as receiving a large order, to have investment demand for fixed assets. However, the lack of a certain degree of financial strength often leads to

the loss of this opportunity. Therefore, the government should provide certain support and subsidies for the investment of new equipment and new tools to promote the transformation and upgrading of small and micro enterprises.

The Exports to Developed Regions Help Reverse the Transformation and Upgrading of Small and Micro Enterprises

The data analysis shows that the more the number of export regions is in Europe, America or developed countries, the better the transformation and upgrading of enterprises than those without export or export developing countries. The product quality requirements of developed countries are often high and the product standards are strict, which is a kind of promotion to the production of enterprises. Therefore, encouraging small and micro enterprises to export trade to developed regions is an effective means to promote transformation and upgrading. However, the insufficient contribution of export delivery value indicates that most of the products from developed regions are at the bottom of the value chain. Although foreign trade has promoted the upgrading of products in a certain sense, the added value of the overall products is low, the technological content is not high, and the main benefits are absorbed by importers.

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