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An Empirical Analysis of Upgrading Status of Zhejiang Traditional Industry Clusters from the Perspective of Global Value Chain

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Abstract: In the current macro-economic background, the traditional industrial cluster upgrading is an important content of transformation and upgrading of Zhejiang's industrial structure and is also a powerful guarantee to realize the sustainable development of Zhejiang manufacturing industry. But there are not so many related articles. Therefore, this article has made a comprehensive research on the upgrading status of Zhejiang traditional industry clusters. To be detailed, this article defines the meaning of traditional industry clusters upgrading, designs a survey questionnaire and makes an empirical research on the upgrading status of Zhejiang traditional industry clusters from the respects of product upgrading, value chain upgrading, enterprise competence upgrading, enterprise network position upgrading and correlation and spillover effects upgrading based on the Global Value Chain. The basic conclusion is Zhejiang's traditional industry clusters have embedded in GVC with a relative low degree. Therefore, those traditional industry clusters are still facing unsymmetrical production and brand power and are still in the in the low-end links with "smile curve".

Key words: Global Value chain, upgrading of traditional industry clusters, smile curve, questionnaire survey

INTRODUCTION

The study on the upgrading of industrial clusters sprang up in recent decades. Since the forms and means various from region to region, some scholars made their own theory research and described the connotation of cluster upgrading. Porter (2002) argued that a cluster will be mature after 10 years of development. If it does not timely upgrade, there might appear recession. Kishimoto (2004) said that upgrading of industrial clusters can be seen from two aspects. The first is the improving of innovation and strengthening of cooperation. The second is the transfer of production activities of enterprises to adapt to the characteristics of the local resources activities. In a word, upgrading of industrial clusters is the abandoning of low-value-added activities and turning to high value-added activities. Gereffi (1999) puts forward the Global Commodity Chain theory and divides upgrading into upgrading inside enterprise, upgrading between enterprises, local or upgrading inside the country and internationally regional upgrading. Humphrey and Schmitz (2000) divide upgrading into process flow upgrading, product upgrading and function upgrading and put forward the fourth upgrading path, i.e. chain upgrading in the year of 2002. The representative studies in the country are: Wang (2001, 2010) thinks that the development path of local industry cluster shall be the

climb-up along the Global Value Chain. Zhang (2005, 2006) gives a comprehensive and systematic analysis on the driving force and administration structure of Global Value Chain and the relation between the Global Value Chain and industry cluster and industry upgrading. Liu (2008) believes that Xuchang Hair Products Industry is at the low value-added link of the Global Value Chain and its industry cluster effect has not been formed, thus the cluster innovation network shall be improved to build the cluster brand. Wei (2011) studies the relation between industry cluster upgrading, regional economic transformation and the growth of small and medium-sized enterprises based on Zhejiang specialty industry cluster cases.

All in all, the thesis draws lessons from the studies of many scholars. But, the existing achievements are mostly standardization research, especially an empirical analysis of Zhejiang traditional industry cluster upgrading status is lacking. As Porter (1998) states that there are still wide profit margins of traditional clusters, which shall not be neglected. Therefore, the thesis gives a relatively comprehensive and systematic empirical study on the Zhejiang traditional industry clusters upgrading, which will help people to understand the upgrading status and the development space of Zhejiang traditional industry clusters.

Table 1: Questionnaire distribution and return

	Ningbo stationery industry cluster	Shaoxing textile and garment industry cluster	Wenzhou liushi low-voltage electrical appliance industry cluster	Yongkang electrical tool industry cluster	Jiaxing wood industry cluster
No. of questionnaires distributed	104.0	96.0	100.0	94.0	86.0
No. of questionnaires returned	74.0	76.0	64.0	62.0	64.0
No. of valid questionnaires	70.0	76.0	64.0	60.0	62.0
Proportion of valid questionnaires (%)	94.6	100.0	100.0	96.8	96.9

Table 2: Product upgrading of the investigated enterprises

Products are upgraded and updated compared to the initial period	128	31.68
Products are basically at the same technical level compared to the initial period	172	42.57
Products are highly competitively and do not need upgrading and updating	16	3.96
Products are upgraded and updated compared to the domestic products	32	7.92
Products are faced with upgrading and updating	56	13.87
No. of enterprises that accept this survey	404	100.00

Table 3: Production chain link of investigated enterprises

	No. of enterprises	Sample proportion (%)
Product assembly	92	27.71
Production of general parts and components	84	25.30
Production of key intermediate inputs	72	21.69
Production of final products	84	25.30
No. of enterprises that accept this survey	332	100.00

Table 4: Following production chain upgrading status of investigated enterprises

	No. of enterprises	Sample proportion (%)
Promoted	232	69.88
Not promoted	100	30.12
No. of enterprises that accept this survey	332	100.00

Table 5: Production mode of the investigated enterprises

	No. of enterprises	Sample proportion (%)
Product assembly	92	27.71
OEM	156	46.99
ODM	68	20.48
OBM	16	4.82
No. of enterprises that accept this survey	332	100.00

Table 6: Production mode upgrading status of the investigated enterprises

	No. of enterprises	Sample proportion (%)
Promoted	256	77.11
Not promoted	76	22.89
No. of enterprises that accept this survey	332	100.00

ANALYSIS OF SURVEY RESULTS

The thesis defines the upgrading of traditional industry clusters from the perspective of Global Value Chain as the promotion of value-added capacity obtaining on the Global Value Chain, the main contents include: product upgrading, value chain upgrading, enterprise competence upgrading, enterprise network position upgrading and correlation and spillover effects upgrading.

During this survey, 480 questionnaires are distributed and 369 questionnaires are returned, with returned rate of 76.88%; 332 questionnaires are valid during the returned questionnaires, please see Table 1 for details.

Current situation of product upgrading: Table 2 shows that products from 31.68% of enterprises are upgraded compared to the initial period; products from 7.92% of enterprises are upgraded and updated compared to the domestic products; 3.96% of the enterprises believe that their products are highly competitively and do not need upgrading and updating; products from 13.87% of enterprises are faced with upgrading and updating.

Current situation of value chain upgrading: Basic production link. 25.30% of the enterprises are engaged in the production of general parts and component (Table 3), 21.69% of the enterprises have stepped into the production stage of intermediate products and 25.30% of the enterprises have stepped into the production stage of final products, amount to 72.29%. At the same time, Table 4 shows that 69.88% of the enterprises are following the path of “Assembly-Production of general parts and components-Production of key intermediate inputs-Production of final products” for promotion.

Production mode: 27.71% of the enterprises are engaged in the simple low-tech product assembly, 46.99% of the enterprises adopt the OEM production mode, 20.48% of the enterprises adopt the ODM production mode and only 4.82% of the enterprises begin to adopt the OBM production mode (Table 5). Besides, from the conversion status of production mode, 77.11% of the enterprises are following the path of “Assembly-OEM-ODM-OBM” for promotion (Table 6).

Research and development, marketing and brand building links. The seminar questionnaire shows that the proportion of enterprises with sales link is 57.83%, enterprises with research and development link is 63.86, 32.54% of enterprises use their own brand (Table 7 and 8). This shows that a considerable part of Zhejiang traditional enterprises have started to engage in research

Table 7: Research and development and sales links of the investigated enterprises

	No. of enterprises	Sample proportion (%)
Only production link	76	22.89
With production and research and development links	64	19.28
With production and sales links	44	13.25
With production, sales and research and development links	148	44.58
No. of enterprises that accept this survey	332	100.00

Proportion of enterprises with sales link = $192/332=0.5783$ and the proportion of enterprises with research and development link = $212/332 = 0.6386$

Table 8: Brand usage of the investigated enterprises

	No. of enterprises	Sample proportion (%)
With the brand of overseas parent company	72	14.29
With the brand of overseas buyer (or its specified brand)	116	23.02
With the brand of domestic buyer (or its specified brand)	152	30.16
With their own brand	164	32.54
No. of enterprises that accept this survey	504	

Table 9: Existing technical level of the investigated enterprises

	No. of enterprises	Sample proportion (%)
Globally advanced level	0	0.00
Filling the domestic gaps	12	3.61
Domestically advanced level	180	54.22
Domestically general level	140	42.17
No. of enterprises that accept this survey	332	100.00

Table 10: Main source of technology of the investigated enterprises

	No. of enterprises	Sample proportion (%)
International market purchasing	12	3.61
Mainly domestic market purchasing	16	4.82
Independent research and development	208	62.65
Commissioned development or cooperative development	16	4.82
Imitation or second innovation	80	24.10
No. of enterprises that accept this survey	332	100.00

and development, sales and brand building activities, the key of future development is how to achieve continuous improvement.

Current situation of enterprise competence upgrading:

Technical competence of the enterprise. Table 9 shows the evaluation of the enterprises on their own technical level. Only 3.61% of the enterprises think their technology can fill the domestic gaps and these enterprises are mainly leading enterprises in the country; 54.22% of the enterprises think their technology are in the domestically advanced level and 42.17% of the enterprises think their technology are still in the domestically general level. On the whole, the existing technical level of the enterprises in Zhejiang traditional industry clusters is relatively high and mostly is in the domestically advanced level.

Table 11: Source of middle and senior management staff in the investigated enterprises

	No. of enterprises	Sample proportion (%)
People from abroad	20	6.02
People from the Chinese mainland	312	93.98
No. of enterprises that accept this survey	332	100.00

Table 12: Training of middle and senior management staff in the investigated enterprises

	No. of enterprises	Sample proportion (%)
Overseas training	24	7.23
National training	308	92.77
Of which: training provided by the enterprise	232	75.32
Training provided by the training institutions	52	16.88
Others	8	2.60
No. of enterprises that accept this survey	332	

Besides, during the main technology source of enterprises in Zhejiang traditional industry clusters, 62.65% of the enterprises adopt independent research and development pattern, 24.10% of the enterprises adopt imitation or second innovation pattern, international market purchasing, domestic market purchasing, commissioned development or cooperative development pattern are less likely to be adopted (Table 10).

Enterprise management ability: Table 11 shows the source of middle and senior management staff in the investigated enterprises and finds that only 6.02% of the enterprises employ people from abroad as their middle and senior management staff, while most of the enterprises employ people from the Chinese mainland.

Table 12 and 13 show the survey results of enterprises' training, which reflect that enterprises place much emphasis on training, but the domestic training methods hold a dominant position, while the proportion of overseas training is only 7.23%. It is closely related to that Zhejiang enterprises are mostly small and medium-sized enterprises, they are more accustomed to national training and the costs for national training are much lower.

Current situation of enterprise network position upgrading:

Firstly, Table 14 shows that, 9.82% of the enterprises' direct customers are international enterprises, 32.43% of the enterprises' direct customers are large domestic enterprises, 47.75% of the enterprises' direct customers are small and medium-sized domestic enterprises. Secondly, Table 15 shows that during the survey samples, 26.50% of the enterprises think their bargaining power with the upstream enterprises are Strong or Very strong, the proportion of Ordinary or below is 73.5, 28.57% of the enterprises think their

Table 13: Average annual training time for each person of middle and senior management staff in the investigated enterprises

	No. of enterprises	Sample proportion (%)
Less than 3 days	80	26.51
3-7 days	120	36.14
1-2 weeks	88	24.10
2-3 weeks	24	7.23
More than 3 weeks	20	6.02
No. of enterprises that accept this survey	332	100.00

Table 14: Main direct customers of the investigated enterprises

	No. of enterprises	Sample proportion (%)
International enterprise	88	19.82
Large domestic enterprise	144	32.43
Small and medium-sized domestic enterprise	212	47.75
No. of enterprises that accept this survey	444	100.00

Table 15: Bargaining power of the investigated enterprises

	No. of enterprises	Proportion (%)
Bargaining power with upstream enterprise		
Very weak	16	4.82
Weak	32	9.64
Ordinary	196	59.04
Strong	76	22.89
Very strong	12	3.61
No. of enterprises that accept this survey	332	100.00
Bargaining power with downstream enterprise		
Very weak	12	3.57
Weak	24	7.14
Ordinary	204	60.71
Strong	72	21.43
Very strong	24	7.14
No. of enterprises that accept this survey	332	100.00

Upstream: Strong+Very strong = 22.89+3.61 = 26.50 (%), Downstream: Strong+Very strong = 21.43+7.14 = 28.57(%)

Table 16: Raw materials and parts sources of the investigated enterprises

	No. of enterprises	Sample proportion (%)
Supplied by the procuring party	64	14.42
International import	92	20.72
Domestic procurement	284	64.86
No. of enterprises that accept this survey	444	100.00

bargaining power with the downstream enterprises are Strong or Very strong, the proportion of Ordinary or below is 71.43%.

Current situation of correlation and spillover effects upgrading: Development of local industry and supporting industries. Table 16 show that 64.86% of the enterprises choose to purchase the raw materials and parts in the country, which reflects that the domestic procurement has become the most frequently used way for Zhejiang enterprises to purchase raw materials and parts.

Employee turnover: Table 17 shows that 5%-10% of the employee turnover is the most common percentage. As shown in Table 18, the turnover percentage of technical and management staff to the foreign-invested enterprises is as high as 45%.

Table 17: Employee turnover percentage of the investigated enterprises

	No. of enterprises	Sample proportion (%)
3%-below	28	8.43
3-5%	68	20.48
5-10%	124	37.35
10-15%	64	19.28
Above 15%	48	14.46
No. of enterprises that accept this survey	332	100.00

Table 18: Main moving direction of technical and management staff of the investigated enterprises

	No. of enterprises	Sample proportion (%)
Foreign invested enterprise	216	45.00
State-owned enterprise	8	1.67
Collective and private enterprise	144	30.00
Become self-employed	112	23.33
No. of enterprises that accept this survey	480	100.00

CONCLUSION

The integration extent of Zhejiang traditional industry clusters into the Global Value Chain is still low, Zhejiang traditional industry clusters are still facing the problems of imbalance between production and brand power and most of them are at the low-end link of the “Smile Curve”.

Current situation of product upgrading of Zhejiang traditional industry clusters: products from 31.68% of enterprises are upgraded compared to the initial period; products from 7.92% of enterprises are upgraded and updated compared to the domestic products.

Current situation of value chain upgrading of Zhejiang traditional industry clusters: traditional enterprises have surpassed the simple assembly stage, 69.88% of them are following the path of “Assembly-Production of general parts and components-Production of key intermediate inputs-Production of final products” for promotion. The production mode of traditional enterprises is still the OEM mode, but 77.11% of enterprises are following the path of “Assembly-OEM-ODM-OBM” for promotion.

Current situation of enterprise competence upgrading of Zhejiang traditional industry clusters: enterprises of traditional clusters have already possessed strong development of and ability to use general technology, but a large gap still exists in terms of basic research, key technological development and original innovation.

Current situation of enterprise network position upgrading of Zhejiang traditional industry clusters: 19.82% of the enterprises’ direct customers are international enterprises, 32.43% of the enterprises’ direct customers are large domestic enterprises and 47.75% of the enterprises’ direct customers are small and medium-sized domestic enterprises. It reflects that Zhejiang

enterprises have begun to integrate into the Global Value Chain and their position on the Global Value Chain has been greatly improved.

Current situation of correlation and spillover effects upgrading of Zhejiang traditional industry clusters: domestic procurement has become the most frequently used way for traditional enterprises to purchase raw materials and parts. But most of the domestic purchases by the enterprises are general or auxiliary equipment.

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