Inducing Factors and Action Model of Low-End Lock-In in Manufacturing Industry Based on Grounded Theory

Huahui Wang

Wu Han University Of Technology, Wu Han, Hubei China

Email: whuahui13319152963@163.com

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Abstract: The real economy is the basis of the national economy, but for a long time, China's manufacturing industry still faces the dilemma of "big but not strong" and is basically locked at the low end of the global value chain. [1] The study on the inducing factors and mechanism of low-end lock-in in China's manufacturing industry will be of substantial significance for the transformation and upgrading of the manufacturing industry. In this paper, we use the grounded theory and Nvivo11.0 qualitative analysis software to analyze different relatively literature and some Policy papers to reveal the inducing factors and action model of low-end lock-in in manufacturing industry. The results show that: The leading factors of Entrepreneurial incompetence and policy environment barriers, [2] the process factors of the capture and the blockade of developed countries and FDI, and the strengthening factor of path dependence all have a significant impact on the low-end lock-in of the manufacturing industry.

1. Introduction

With the development of economic globalization, different processes in the manufacturing process are assigned to different countries, each participating in the international division of Labour according to its comparative advantage. [3] After China's integration into the global value chain, it has gained some value chain profits. However, due to the lack of innovation ability and the intentional technical blockade by multinational enterprises, China has long been engaged in low-end processing and assembly in the value chain dominated by developed countries in Europe, the United States and Japan, with low added value per unit product. [4] [11]

The "lock-in effect" was first proposed by Arthur (1989) when he studied technological innovation in developing countries.[7] Foreign related research started earlier, Kaplinsky (2000) pointed out that if enterprises only rely on lowering the salary of employees and the price of products to improve their competitiveness, then the low-end development phenomenon of increasing output and exports but decreasing income will occur. Review previous studies in China, we can divide the reasons for the low-end lock-in of GVC into two aspects: on the one hand, foreign factors, and low-end lock-in originated from the technological power of developed countries and multinational companies (Liu Zhibiao and Zhang Jie, 2007). On the other hand, domestic factors. [2]Low-end locking is due to the inappropriate participation of local enterprises in the global commodity value chain and the lack of enterprise capacity (Liu Zhibiao, 2007).[6] The existing research theories and viewpoints have laid a solid foundation for exploring the inducing factors of low-end lock-in in manufacturing industry. However, from the existing literature, the research on the inducing factors of low-end lock-in in China's manufacturing industry is still limited to the domestic and foreign reasons, and the research is relatively few and still at the initial stage, lacking of the analysis of the role of domestic environmental factors and the analysis of the deep-seated role models of each factor. [8] [10]

In this paper, the grounded theory is used to analyze the factors and models of low-end lock-in in order to provide theoretical basis and policy recommendations for the development and transformation of manufacturing industry. [5] The paper starts from the step-by-step formation of the

low-end lock-in, from the perspective of China's manufacturing industry decision-making, control and blockade after entry and the formation of the final path dependence, three core factors are extracted, and the model is established according to the spindle category and the core category. Therefore, it is of great theoretical and practical significance to make a systematic analysis and discussion on the causes of the low-end lock-in in China's manufacturing industry. [9]

2. Research methods and data sources

2.1 Research methods

this paper uses grounded theory research method to study the inducing factors of low-end lock-in in Chinese manufacturing industry and its action model. Grounded theory is a qualitative research method to construct the theory of substance from bottom to top on the basis of empirical data. To explore the cause of phenomenon, we can use this method to analyze the data deeply and systematically, in order to achieve the degree of theoretical saturation.

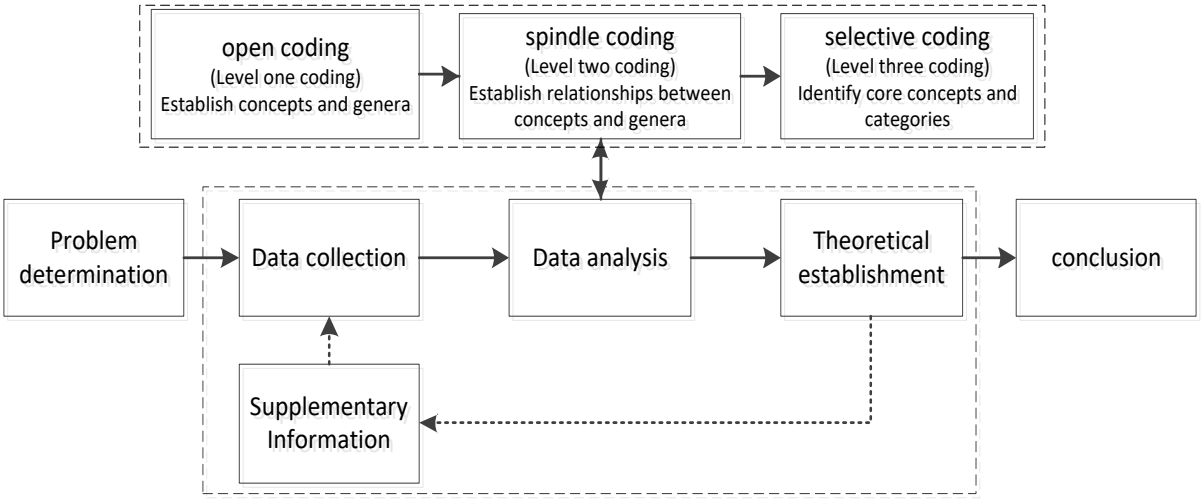

Figure 1.The Process of the research method

2.2 Data Sources

The research data of this paper includes 20 Chinese article, 5 references foreign literature, three international conference papers and related national "development strategy for manufacturing innovation driven", "advanced manufacturing national strategic plan", "2025" made in China "much starker choices-and graver consequences-in planning" and so on four policy file, and add 10 copies of Chinese literature theory to examine the saturation.

3. Research process and model construction

3.1 Open coding

First, all the documents were imported into the Nvivo11.0 software, and the relevant content of low-end location-inducing factors in the manufacturing industry was extracted after reading through the literature, which was broken down into independent descriptive sentences, totaling 156 sentences. Then, these statements are summarized to form 45 preliminary concepts, categorize the concepts, and finally get 21 categories. The process of concept and categorization is repeated twice. There are 152 statements with the same encoding results in the whole process, accounting for 97.65% of all the statements. The encoding results of statements are reliable. The open coding results of the research data in this paper are shown in table 1 and table 2 respectively, and the open coding results are listed in part.

Table 1. Conceptualization based on open categories

Serial number	concept	Serial number	concept
1	The "learning by doing" effect is confined to the traditional advantageous sectors	2	Rational contract manufacturers don't choose to upgrade production capacity
3	FDI control and lock-in	4	Chain of the main enterprises blocking
5	FDI profit	6	Path dependence
7	Passive Acceptance of division of Labor tasks	8	Module technology path dependence
9	Marginalized by the core value chain system	10	Insufficient domestic demand
11	Loss of comparative advantage	12	The competency gap
13	Lack of innovation	14	The employment stability of migrant workers is insufficient
15	Contract factory	16	Common modules restrict the space for technical innovation
17	Low-end wage-cost advantage	18	Enterprise chain choice mechanism
19	Local governments give foreign investment advantages	20	Global value chain low embedding
21	The advantages of the developed world	22	Insufficient accumulation of talents and technical elements
23	Capture of developed countries and leading firms	24	The demographic dividend tends to disappear
25	Disadvantages of product modularity in developing countries	26	Loss of ability to innovate independently
27	Increasing returns to scale	28	Market forces lag behind
29	State of domestic enterprises	30	The inflow of foreign capital is purposeful
31	Structure and scale of domestic market	32	The processing trade-oriented foreign trade model is not conducive to the transformation of economic structure
33	The resources of backward countries are locked in	34	Factor Environment
35	Technological innovation is blocked by foreign capital	36	Attachment Development
37	Weak absorptive capacity of technology spillover	38	Insufficient government subsidies
39	Structural bias and distortion	40	Institutional Environment
41	Weak economic foundation	42	Insufficient conditions for transformation and upgrading
43	Low-end factors such as labor are locked in by foreign investment	44	Low levels of capital and labour
		45	The pattern of resource allocation was changed

Table 2. Open coding example

Serial number	Example of the original statement	Conceptualization	Categorization
3/5/35/43	The existing technology of a country is often controlled by the introduction of foreign capital, and its own technological innovation is restrained.	FDI control and lock-in	FDI lock-in
11/12/13/24/22	The developing countries have less and less room to exert their comparative advantage strategy when their comparative advantage gradually loses and their core competitive ability has not been formed.	Loss of comparative advantage and non-formation of core competence	Loss of comparative advantage
4/9/21/23/33	The "capture effect" of the developed	Capture by developed	Capture effect in

Serial number	Example of the original statement	Conceptualization	Categorization
	countries to the developing countries in the value chain upgrading stage is also the possible cause of the "low-end lock-in" .	countries in the process of value chain upgrading in developing countries	developed countries
2/6/8/18	Some rational contract manufacturers do not upgrade their own production capacity, which is the root cause that most local contract manufacturers are locked into low-end lock-in early in the upgrade.	Rational contract manufacturing enterprises do not choose to upgrade production capacity	Selection of domestic enterprises
6/7/15/8	Reliance on high-quality imports from GVC has led to a shift to low-end, labor-intensive industries, hampering the process of upgrading.	The Path dependence of contract work in China	Path dependence of domestic enterprise activity
31/32/39	Reliance on high-quality imports from GVC has led to a shift to low-end, labor-intensive industries, hampering the process of upgrading.	The Path dependence of contract work in China	Path dependence of domestic enterprises

3.2 Spindle coding

After the above procedure, continue the analysis, and ponder over the relationship between the categories, looking for other categories that can be similarly generalized by the corresponding main category, until no other category can be included in this category. In this way, a total of 6 main categories are extracted, which are composed of 2 leading factors of embedding selection at the lower end of GVC,2 process factors of controlling enterprises, and 2 strengthening factors of path dependence.

Table 3. spindle coding

Principal category	Reference Point	Source of material	Corresponding category	Reference Point	Source of material
Leading factor	24	16	Business conditions	13	7
			Policy Environment conditions	11	9
Process factor	32	22	FDI lock-in	17	10
			Chain master control	15	12
Strengthening factor	27	18	Loss of core abilities	8	6
			Path dependent reinforcement	19	12

3.3 Selective coding

This study extracted the core category of "low-end locking inducers in manufacturing industry", namely selective coding, and constructed a model of low-end locking inducers in manufacturing industry.

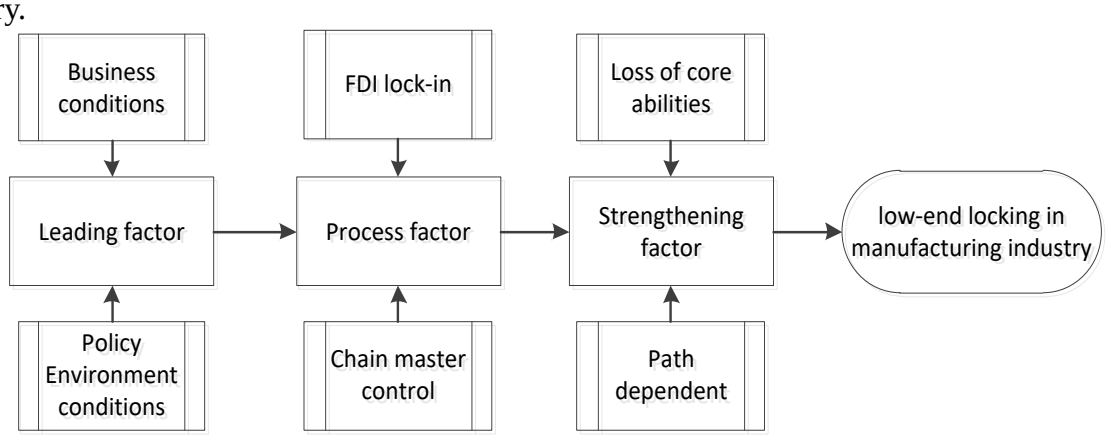

Figure 2. The model of inducing factors of low-end lock-in in manufacturing

3.4 Theoretical saturation test

In this study, theoretical saturation test was carried out by analyzing the reserved 10 Chinese literatures. The results show that no new categories and relationships have been found for the main categories of low-end locked-in triggers in the manufacturing industry, indicating that the theoretical model above has reached saturation.

4. Conclusions and prospects

Based on the grounded theory following a bottom-up Paradigm and the Number of reference points and material sources in the coding results, We can determine the weights of different categories. Finally, the paper explores the factors that induce the low-end locking in manufacturing industry, and concludes that the low-end of manufacturing industry is embedded into the global value chain from the aspect of selection, to enter the global value chain and suffer from international buyers and chain owners of the "capture" and thus lock in the low-end situation, and because of its path-dependent factors and structure, resulting in its difficult to upgrade the structure and get rid of the low-end state, thus forming a low-end lock-in dilemma.

In the follow-up research, we can pay more attention to the global current affairs information, and make corresponding supplement to the inducing factors of the low-end lock-in in manufacturing industry. At the same time, we have probed into the causes of the low-end lock-in, and we should also make corresponding research from the aspects of transformation or upgrading, in order to put forward the policy suggestion for the development of manufacturing industry.

Acknowledgements

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