Research on the Construction of Endogenous Industrial Security in Early Warning Index System

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Abstract—**In recent years, Chinese foreign trade and economy suffered great impact, domestic industrial development and industrial security are faced with great challenge. Aiming at this situation, this article sets out from inside the industry, through internal organic industrial security of exploration and research, analyzes the endogenous factors affecting the safety of industry, and has carried on the selection of relevant indicators, on the basis of endogenous industrial security in early warning index system is constructed.**

Keywords-endogenous industrial safety; index analysis; early warning index system

I. BACKGROUND OF ENDOGENOUS INDUSTRIAL SECURITY

Since the world financial crisis, the economic in the world's countries and regions has suffered large impact, the trend of the growth of the global economic is slow down. In this context, China as the export-oriented economy, also affected by the financial crisis, the domestic industrial development and security face greater challenges. In the face of this situation, China should strive to prevent the impact of the external environment of Chinese industrial security and influence, but due to the external environment is complicated, which requires to start from their own industries internal, through the analysis of internal factors to determine the status of the industry in our country and make corresponding prevention early warning work.

A. The Meaning of Endogenous Industrial Security

Endogenous industrial security is to point to in some industries within a country on the inside and not from the same industrial development condition, has sufficient ability to resist, guarantees the balanced development of the industry is not threatened status. And endogenous industrial safety from one country's industry itself, to the various internal factors that affects the industry analysis and evaluation, to determine whether the industry security.

B. The Characteristic of Endogenous Industrial Security

In general, the endogenous industrial safety basically has the following three characteristics:

1) Systemic

Factors of endogenous industrial safety are various, the influence of these factors interact with each other, by some mechanisms which influence the development of the industrial safety and direction. Industrial safety at the same time, affecting the safety of industry not only comes from inside the industry, but also has a lot of external factors made an impact on the industrial safety, there is a link between internal and external factors. Therefore, only from the perspective of comprehensive and system to go to the endogenous for industrial safety, can China correct security policy and the real estate industry to develop reasonable and effective measures.

2) Strategic

National economy is one of the important links of industrial safety, it is related to the sustainable development of national economy and people's livelihood and economic scale. Intact if China want to ensure that a country's economic interests, should make the country's industry security, at the same time, according to the characteristics of different industries to differentiate among the different factors affecting the safety of the industry, to set up a corresponding early warning index system in specific industry, set industrial security in early warning. Therefore, China should from the strategic height to analyze and explore the industrial safety issues.

3) Dynamic

In different period of economic development, the various influence factors of economic growth within the industry is not invariable, and the organic industry safety is a dynamic concept. In a certain period, the industry is safe, but in another period of time, this industry may not be safe. At the same time, the realization of industrial security means and way is also a dynamic change, so the safety situation should be according to different industries in different periods, formulate corresponding measures is particularly important.

C. Components of the Organic Industrial Security

The components of the organic industrial security have the followings:

1) Factors affecting the safety of endogenous industry come from industry itself.

According to the definition of endogenous industry safety, the factors affecting the safety of endogenous

industry come from industry. The factors such as the industrial life cycle, this is by the industry characteristics of their own development and summarizes the influencing factors, was born in industry within the internal and the influence on the industrial safety. In the different stages of industry life cycle, the degree of industry security is also different. And external influence industrial security is independent from industries, refers to how the external environment impact on the national industrial safety. Such as FDI, national debt, trade barriers are independent from the industry.

2) Factors affecting the safety of endogenous industry are generally can be controlled.

For external factors affecting the safety of industry, as a result of these factors are independent from the industry, so the enterprise generally cannot change and control the external environment, and can only be based on its adjustment to adapt to and reduce the influence of external environment on the industry. And endogenous factors are the industry's own characteristics, the general enterprise can adjust to control these factors, to change the influence degree of the industrial safety. In terms of innovation, enterprises can improve their ability of technology innovation, to change and control the influence degree of the innovation of industry safety.

D. Significance in Endogenous Industrial Security Research

Exploration and research on the industry security issues, on the one hand, can improve and promote the development of industry, on the other hand also make deeper level of industrial economy. As the world economic cooperation to strengthen ceaselessly, industrial security has risen to national economic strategy, the industry security issues is helpful to improve the competitiveness of the industry as a whole, improve the industrial safety, so as to effectively safeguard national economic security. At the same time, because our country is in transition from planned economy to market economy and from extensive growth to intensive growth pattern transformation, the industrial safety problem in the process of economic development for countries is to adjust the industrial structure, formulate relevant industrial policies, strengthen the competitive ability in industry plays a very important role.

II. ANALYSIS OF ENDOGENOUS INDUSTRY SECURITY IN EARLY WARNING INDEX

According to the analysis of industrial safety internally by nature, we analyzed the factors affecting the safety of endogenous industries, find out the influence as the following indicators:

A. Industry Itself

1) Industry life cycle

Industry life cycle is to point to an industry through the process of production, the development until the decline and fall, normally China divided the process into introduction stage, growth stage, mature stage and decline stage, it is the development of the industry experienced four stages in table I. In different stage, the industry shows different characteristics, the competitiveness of the industry and facing the risk is also different. Industry life cycle can be measured by output growth rate and growth rate of investment scale.

TABLE I.   CHARACTERISTICS IN EACH STAGE OF INDUSTRY LIFE CYCLE

Cycle	Number	Output value	Industrial competitiveness	Industrial risk
Introduction stage	Less	Low	Lower	More risk, not safe
Growth stage	More	Higher	High	Less risk, safe
Mature stage	Stable	Higher	High	Stable development, safe
Recession stage	Reduce	Low	Reduce	More risk , not safe

2) Product quality

Quality is the life of an enterprise. The revitalization of the development of the enterprise, is inseparable from the comprehensive promotion of product quality. Product quality is the responsibility of the enterprise most, and also the head of the industry development and the revitalization of, is a basic factors determine the size of the industry competitiveness. In the domestic industry competition, who have high quality, who can have the last laugh; Similarly, in the international competition and in the same industry, who has the better quality, who will have more sufficient reasons to win. Only with higher quality, the competition will be more belief, and have the industrial safety guarantee.

China usually use the average technical performance indicators, product quality level, product quality grading index to measure. Among them, the rate of product grades = product yield/all conforming product yield by 100%.

3) Human capital

Human capital is mainly refers to the investment of human, effective to promote the development of industry resources, can influence industry innovation, is also an important force in the national economic strategy implementation.

Human capital is mainly refers to the investment of human, are effective to promote the development of industry resources, influence industry innovation, is also an important force in the national economic strategy implementation. Industry growing, the influence of the amount of human capital, here China use the staff education scale, specialized technical personnel proportion to measure human capital.

4) Level of science and technology

The level of science and technology is the key factor in industry development. The strength of the scientific research ability, an enterprise decides the future of the enterprise competitive power, influence the enterprise market share, at the same time, the security level of the whole industry will be affected.

5) Independent innovation ability

Innovation is an important factor affecting the development of industry, is the enterprise based on the fundamental, is the deep development of the industry. Promote independent innovation ability is the key to industries. Therefore China should be combined with characteristics of its own development, continuously improve technology, improve the innovation ability, work with the core competitiveness of products, integrate resource advantages, expand its influence.

China use R&D costs, the number of patents and researcher to measure the independent innovation ability of industry, the indicators of the higher the value, is the industry's competitiveness and industry safety degree is relatively higher.

B. Economic Structure

1) Industrial scale

Industrial scale has a certain influence on internal organic industrial safety. Industry scale, the greater the instructions in the industry have scale advantage. Industry scale can reduce the production and operating costs, expand market share, save social resources. No competitive advantage, it will be difficult to create famous brand.

2) Industrial economic benefits

Good economic benefits are the basic conditions for industry strong competitiveness. An industrial economic benefits, the better, in general, the stronger the competitiveness, cannot obtain better economic benefit industry, it is difficult to across the country and even around the world have stronger competitiveness.

Industrial economic benefit is measured by industry profit margins and ratios. Among them, the ratios (%) = industrial sales/output value by 100%. Industrial scale indicators China selected is: product sales income, output and employment scale.

3) Industrial layout

Industry layout will be in a certain extent affect the industry security. Industry cluster phenomenon in the process of industry layout can help the enterprise to obtain the required resources, promote the growth and development of enterprises. Industry layout available coefficient of location quotient can be measured as concentration factor. Among them, the coefficient of location quotient refers to a country or a region of an industrial sector in the national share the same department as well as the country's or region's industrial added value in the national industrial added value ratio of the share, if the value is greater than 1, meant the industry sector in the proportion of the country or region have a high level of centralization, and industry consolidation degree is relatively high. Concentration factor is to point to the industry layout, the average output value of a single industry or average income in the national average share of corresponding industries.

C. External Environment

1) Competitive environment

Under the industrial security theory framework, extensive predatory competition and monopoly is not only destroy the normal economic order, but also can cause great waste of natural resources. Unreasonable competition will influence on the integration of industrial structure, thus security threat to the industry, and orderly competition, however, will enhance the vitality of the market.

The degree of competition in general use Hector fender index (HHI) to represent. Hector fender index refers to the concentration of industries, HHI = industry has a larger market share of enterprise sales/the industry in the domestic sales, the index will decrease with the strengthening of the market competitiveness.

2) Resource supply

Resource is the foundation of industrial development and important support. Resource supply situation will importantly influence on industry's competitive advantage. Insufficient supply of factors in production, industrial development is faced with a lot of disadvantages.

At present, in the continuous development of economy, China's energy agency is unreasonable, the asymmetry of supply and demand for resources: the coal demand is less than the supply, the oil supply system is not perfect, the domestic industry waste and the phenomenon of excessive occupancy resources. This makes these resources as the basic factors of production in coal, petrochemical and natural gas industry is faced with severe challenges. Supply general use per capita energy consumption, proven mineral reserves and proven to measure the fossil fuel energy reserves.

3) Foreign direct investment (FDI)

The equity of foreign direct investment is through to our country industrial control to influence the safety of China's industry, mainly expressed in environment, market share, industrial development strategies, etc. Foreign investment in higher proportion of equity share of industry in China, in other words, the notion of a domestic industry is lower, so safety is affected by the domestic industry and the more serious the threat is.

III. ENDOGENOUS INDUSTRY SECURITY IN EARLY WARNING INDEX SYSTEM OF BUILDING

A. Principle of Warning Index System Construction

For the operation of the safety evaluation and monitoring of industry, China need to build a complete scientific early warning index system to measure the running situation of the industry, and the building of this system should follow certain principles:

1) Scientific system

Selecting indexes should comply with reasonable structure and logic, ensure that more objective, accurate and complete reflect the characteristics of the industrial safety, early warning and the rationality of the results to ensure that industry and standardization. The construction of index system should be in general can form a system, form the characteristics of unity and organic.

2) Controllable operation

The selection of indicators is in guaranteeing scientific, while China should ensure the controllability and operational. First of all, the choice of the indicators must be controlled, can control performance in the industry status quo and the existing resources integration; and index system should be able to make the operation can be after the establishment, to take advantage of in the forming industry security practices.

3) Dynamic and practical

Due to the organic industry security itself has the characteristics of dynamic, so the selection of indicators is not fixed. At different times, based on the development of industry, the selection of indicators may be different, to be as the change of economy and industry development in a timely manner to update and supplement indicators.

4) Combination qualitative with quantitative

Endogenous most can quantitatively reflect the industry security features, characteristics and some inconvenience by Numbers reflect directly. This requires the establishment of early warning index system, to combine the qualitative indexes and quantitative indexes, give priority to with quantitative indicators, so as to make the early warning index system more objective, more real.

B. Construction of Early Warning Index System

According to the principle of the construction of early warning index system and the internal nature in front of the selection of industry security in early warning indicators, this article establishes the endogenous industry security in early warning index system as follows:

Industry development force
- Industry life cycle (Growth rate of output and investment scale)
- Product quality(Product innovation index, product grade rate, product structure)
- Industrial scale (Product sales income, output, employment scale)

Industry competitiveness
- Independent innovation (Scientific research cost, number of scientific research personnel and invention patent number)
- Amount of human capital (Record of formal schooling level distribution)
- Technical progress (Degree of high-tech innovation, labor productivity)
- Industrial economic benefit (Ratios and profit margins of industry)

Environmental Industry
- Industry layout(Location quotient factor and concentration factor)
- Supply of resources (Energy consumption per person in the supply of natural resources)
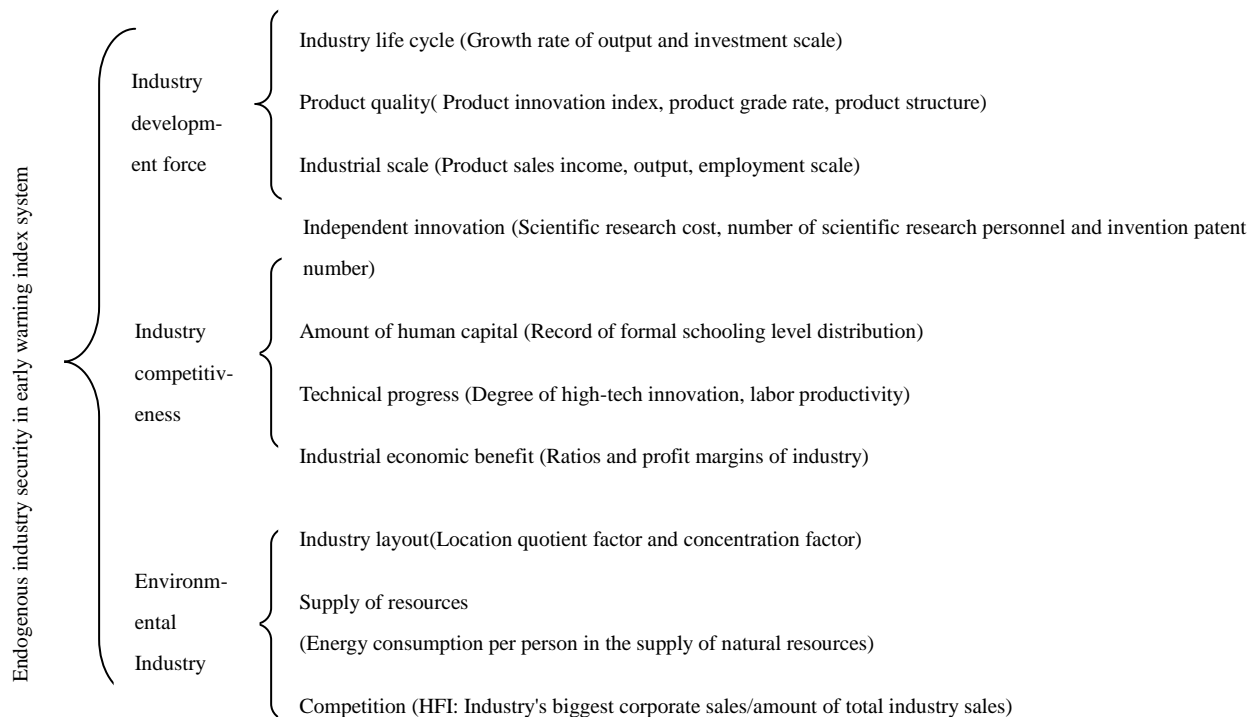- Competition (HFI: Industry's biggest corporate sales/amount of total industry sales)

Figure 1.   Endogenous industry security in early warning index system

The early warning index system is from the industrial competitiveness, industrial development and industry environment, at the same time, the following respectively set up 10 primary index and 24 secondary indexes. Through the establishment of endogenous industry security in early warning index system, from inside the industry will help us to find deep reason affecting the safety of industry, and in a timely manner to make strategy, fundamentally prevent and solve the problem of industrial crisis.

C. From the Perspective of Industrial Safety, Take out Suggestions for Our Country Industry Security

1) Correct positioning own advantages, with the development of strategic emerging industry lead to the development of the industry structure

Make efforts to promote the first, second, third industry and drive the development and transformation of

the existing imbalance development mode, give full play to the advantages of labor and resources in China, and encourage foreign enterprises to strengthen management and promote the development of industry steadily for a long time.

2) Starting from the interests of the whole country, protection industry's development

Global market is in competitive environment, the development of industry in China needs to rely on the integration of international capital and resource advantages, draw lessons from and improve the shortage of its own industry advantage, at the same time China will continue to improve the industry the development of the industry. China should also show comparative advantage of huge potential, and make efforts to enhance the brand image, enhance core competitiveness, so as to realize the dynamic development of industrial cluster.

3) Promote innovation in investmental environment, improve the efficiency in the field of industry

Investment environment is related to whether it can attract and make good use of the industrial advantage condition, this requires to not only improve the infrastructure construction of good environment, create more efficient, open, fair administrative environment and policy environment, but also create a unified and open market environment and soft environment.

In a word, establish perfect early warning mechanism need the government to collect data to establish industry database, to facilitate to forecast and analysis. Second is to choose the appropriate early warning in analysis method, and be perfected and improved continuously,

make the early warning system tends to streamline. Then, to build a strong operability and randomness of the early warning index system, subsidiary index adjusted based on the characteristics of each industry, to meet the industry's own characteristics. Finally, after the early warning results timely feedback, appear when to take remedial measures accordingly, and automatically update the existing database.

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