

Research on the Stability of Supply Chain's Sustainable Development Capability under the Internet Model

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Abstract: *The emergence of the Internet model has brought new challenges to the sustainable development of enterprise supply chain, and the evaluation of the stability of sustainable development capability is the key to ensure the effective implementation of the supply chain model. Build the evaluation index model of sustainable development capability, as the basis for obtaining the evaluation index, determine the stability evaluation index of sustainable development capability from three aspects of economy, society and ecological environment, and evaluate the stability of the sustainable development capability of the supply chain under the Internet model with the rank correlation coefficient. The official data collected from the China E-commerce Statistical Yearbook shows that before 2015, the stability of the supply chain sustainable development ability of e-commerce enterprises under the Internet mode was poor; From 2015 to 2021, the supply chain of e-commerce enterprises in the Internet mode has a good stability for sustainable development.*

Keywords: *Internet mode; Supply chain; Sustainable development capacity; Stability*

1. Introduction

In recent years, my country has paid more and more attention to the sustainable development capability of enterprise supply chain. A sustainable supply chain is a complex of social, ecological and corporate economic environments, affecting the entire manufacturing process of an enterprise. The implementation of a sustainable supply chain by an enterprise can not only reduce the production cost of the enterprise, save enterprise resources, but also bring greater economic benefits to the enterprise and enhance the brand value of the enterprise. Therefore, the sustainable development capability of the enterprise supply chain has become the rapid development of the enterprise necessary conditions. Although the sustainable development of many enterprise supply chain management models in China has achieved certain results, with the rise and development of the Internet model, the supply chain management model of enterprise sustainable development has undergone subversive changes. The evaluation has become the focus of academic attention. Attaching great importance to the sustainable development of the enterprise supply chain can not only maximize the utilization of enterprise resources, but also create the long-term development value of the enterprise. Therefore, it is an urgent task to evaluate and study the stability of the sustainable development capability of the supply chain under the Internet model.

2. Constructing the evaluation index model of sustainable development capability

The evaluation index model of sustainable development capability [1] is a comprehensive evaluation tool involving many factors. When building the evaluation index model of sustainable development capability, there are mainly two steps: designing the model framework and the number of model layers. This model effectively relates the evaluation indexes in each layer according to a certain logical relationship. Regarding the evaluation of the sustainable development capability of the supply chain under the Internet mode, different evaluation indicator models will be selected, and the evaluation indicators obtained will be quite different. Therefore, in order to obtain more objective evaluation results, this paper introduces the PSR model, which can more comprehensively present the sustainable development capability of the supply chain. There are many quantitative evaluation indicators through this model, so more objective evaluation results of sustainable development capability can be obtained. Then the PSR model of sustainable development capability evaluation index

constructed in this paper is shown in the following figure 1:

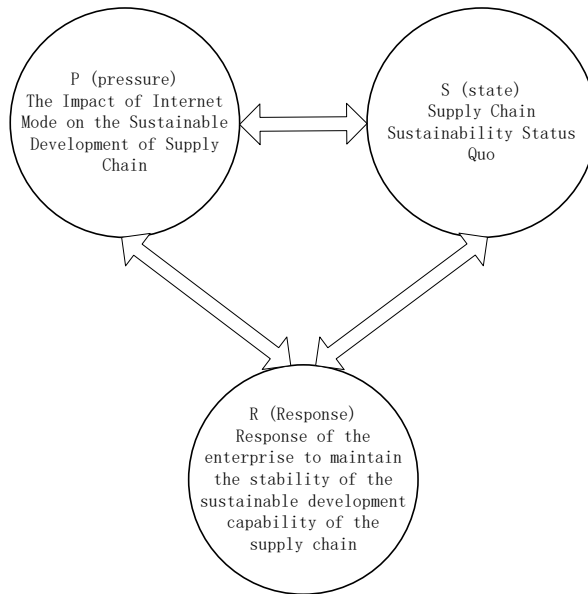


Figure 1: Model of Sustainable Development Capability Evaluation Indicators

As can be seen from the figure, the sustainable development capability evaluation index model constructed in this paper consists of three aspects: P is the driving force of the entire evaluation index model, which can reflect the impact of the Internet model on the sustainable development capability of the supply chain, and can accurately The evaluation indicators are linked together; S reflects the development and status quo of the sustainable development of the enterprise supply chain; R reflects the role of the enterprise as the main body of maintaining the sustainable development of the supply chain when it brings constraints to the Internet model. response measures taken. Aiming at the evaluation research on the stability of the sustainable development capability of the supply chain under the Internet mode, by constructing a PSR model of diverse nature, a more complete data collection can be achieved, and a more comprehensive and objective evaluation index can be obtained.

3. Determine the stability evaluation index of sustainable development capability

Select a series of interrelated and independent evaluation indicators for the stability of sustainable development capability [2], which can comprehensively and objectively measure the sustainable development capability of the supply chain under the Internet model. In order to obtain more accurate evaluation results, this paper needs to follow the following principles when determining the stability evaluation index of sustainable development capability: first, comprehensively consider the role of economic, social, ecological and other factors in the process of sustainable development of enterprise supply chain; Secondly, we must select scientific and accurate evaluation indicators through the official website, and at the same time, we should comprehensively consider the correlation between the Internet model and the enterprise supply chain to determine the comprehensive evaluation indicators for the stability of sustainable development capabilities, so as to minimize the duplication of evaluation indicators and promote a clearer sense of hierarchy of evaluation indicators; Finally, we must follow the principle of operability, taking into account the measurability of the evaluation index data. Since the research on the stability evaluation of the sustainable development capability of the supply chain under the Internet model is a multi-level and multi-factor problem, this paper refers to the relevant literature [3], and follows the scientific, reasonable and comprehensive and objective conditions, based on social benefits, economic benefits and environmental conditions. The three aspects of benefit are used to determine the stability evaluation index of sustainable development capability. Assume that the first-level evaluation index set for the stability of the sustainable development capability of the supply

chain in the Internet mode is $P = \{P_1, P_2, P_3\}$, that is, $P = \{\text{society, economy, surroundings}\}$, and each index factor in this first-level evaluation index set has n second-level indicators, that is:

$$\begin{cases} P_1 = \{P_{11}, P_{12}, P_{13}, \dots, P_{1n}\} \\ P_2 = \{P_{21}, P_{22}, P_{23}, \dots, P_{2n}\} \\ P_3 = \{P_{31}, P_{32}, P_{33}, \dots, P_{3n}\} \end{cases} \quad (1)$$

In the formula, the social benefit evaluation indicators mainly consider the contribution of the sustainable development of the enterprise supply chain to the society, that is, the external indirect economic benefits. The secondary evaluation indicators include: rational use of social resources, tax payment, providing employment services, brand value, etc; The economic benefit evaluation index mainly considers the cost composition of the enterprise's supply chain, and its secondary evaluation index includes: the cost generated by the ordering, production, inventory, transportation, sales and other links of the supply chain; The environmental benefit evaluation indicators mainly consider the harmonious and sustainable development of human and nature, and the secondary evaluation indicators include: green manufacturing, product recycling, environmental pollution, etc. The sustainable development of enterprise supply chain can not be separated from these factors, so this paper takes this as an index to evaluate the stability of sustainable development capability.

4. Evaluate the stability of the sustainable development capability of the supply chain under the Internet model

The Internet model [4] is to use the Internet as a medium to break the original supply chain management model of enterprises, and promote the transformation and upgrading of the enterprise supply chain to online and data. On the whole, the evaluation research on the stability of the sustainable development capability of the enterprise supply chain is to improve the management level of the enterprise supply chain and ensure the sustainable development of the enterprise supply chain [5]. Combined with the stability evaluation index of sustainable development ability determined in the above paper, this paper uses the hierarchical correlation coefficient to measure the stability of the sustainable development ability of the supply chain under the Internet mode. First of all, it is necessary to standardize the evaluation index data of sustainable development capability, and then use the combined evaluation method to obtain the ranking value of the supply chain sustainable development capability evaluation in the Internet mode, and finally obtain the sustainable development capability stability index value according to the rank correlation coefficient. This evaluates the stability of the sustainable development capability of the supply chain under the Internet model. The formula is expressed as:

$$W = \frac{\sum_{j=1}^N D_i}{N} \quad (2)$$

Including:

$$D_i = 1 - \frac{6 \sum C^2}{M(M^2 - 1)} \quad (3)$$

Where, W represents the stability index of the supply chain's sustainable development capability under the Internet model; N represents the number of evaluations; D_i represents the rank correlation coefficient of the ranking result of the stability evaluation index of the i sustainable development capability; M represents the number of stability evaluation indicators of sustainable development capability; C indicates the level difference between the stability of the sustainable development capability of the supply chain in the Internet mode and the two ranking situations. The larger the value of W obtained according to formula (2), the better the stability of the sustainable development capability of the supply chain under the Internet mode; On the contrary, the smaller the value, the worse the stability.

5. Evaluation results

According to the evaluation ideas in the above article, this article collects the data from 2012 to 2021 through the China E-Commerce Statistical Yearbook, and then normalizes the evaluation indicators of the stability of sustainable development capabilities. The processed data is shown in the following figure 2:

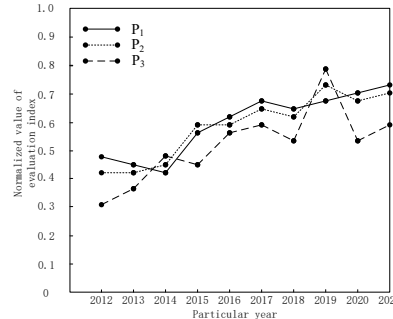


Figure 2: The result of normalization of evaluation indicators

Then use the data in the figure to evaluate and analyze the stability of the supply chain sustainable development capability of China's e-commerce enterprises, and obtain the evaluation results as shown in the following figure:

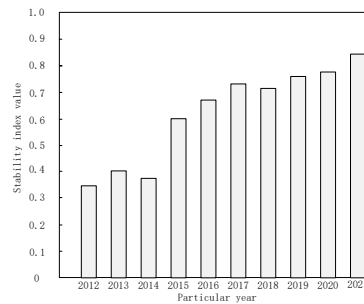


Figure 3: The results of the stability evaluation of the sustainable development capability of the supply chain

As can be seen from Figure 3, before 2015, the sustainable development capability of my country's e-commerce enterprise supply chain was relatively poor. At this stage, the supply chain of my country's e-commerce enterprise was in the period of integration with the Internet model, and the Internet model was the original e-commerce enterprise. A stable and sustainable supply chain will bring a certain impact, resulting in poor stability at this stage. After 2015, my country's e-commerce enterprises' supply chain sustainable development capability is stable, and the stability is basically in a state of continuous improvement. At this stage, the information infrastructure built by the Internet model for e-commerce enterprises is basically perfect, helping e-commerce enterprises to effectively reduce the cost of product production and sales. At the same time, the Internet model also brings certain benefits to the logistics and transportation links of e-commerce enterprises, effectively improving the circulation efficiency of e-commerce products. During the period from 2015 to 2021, the Internet model has a promoting effect on the stability of the sustainable development of the supply chain of e-commerce enterprises in my country, and is conducive to the steady and sustainable expansion of the transaction scale of e-commerce enterprises.

6. Conclusion

Supply chain, as the core link of contemporary Chinese enterprises' competition, has received more and more attention for its sustainable development capability. Therefore, the stability research on the sustainable development capability of supply chain under the Internet mode is crucial. With reference to relevant materials and combining with the evaluation index of sustainable development capability, this paper conducts an evaluation and analysis on the stability of the sustainable development capability of the supply chain under the Internet mode. Through the evaluation results, it provides a theoretical

basis for the sustainable development of the enterprise supply chain. Of course, the evaluation research on the sustainable development capability of the supply chain still needs to be further improved, so that Chinese enterprises can develop rapidly under the safe and stable supply chain management mode.

References

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