A NONLINEAR EMPIRICAL ANALYSIS ON INFLUENCE FACTOR OF CIRCULATION EFFICIENCY

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ABSTRACT. A series of phenomena including lower circulation efficiency of Chinese fresh agricultural products, postharvest decay, damage and waste of agricultural products, regional and structural contradiction of supply and demand, drastic fluctuation in price and difficulty in buying and selling, etc. are serious, which has restricted the sound development of Chinese fresh agricultural product industry. To analyze and discuss main factors affecting circulation efficiency of Gannan navel orange, the methods, such as AHP (analytic hierarchy process) and Delphic method, etc., have been used for empirical analysis on Gannan navel orange, and it is found that fruit factors (including single structure and centralized mature period of navel orange, etc), infrastructure factors (including the lack standardization for construction of trading place, outdated warehousing facility and technology, insufficient input of infrastructure of cold chain, etc) and policy environment factors (including food safety, absence of relevant laws and regulations of market supervision, etc) are the existing main factors restricting high-efficient circulation of Gannan navel orange. Based on the conclusion of empirical research and beginning with main circulation links of production, storage and transportation as well as marketing, etc and supporting measures of brand building, product safety and policy service system, etc. the countermeasures and suggestions are proposed to improve circulation efficiency of Gannan navel orange.

Introduction. In recent years, the demand of people for fresh agricultural products has been rising sharply, and new requirements in several aspects of product type, freshness, nutritive valve and delivery time, etc. have been proposed. However, for characteristics of quality perishability, production seasonality and territoriality, etc. existing in fresh agricultural products itself and current situation where operation efficiency of Chinese circulation system of agricultural products is low, a series of problems of fresh agricultural products in the process of circulation, such as serious decay and damage, difficulty in buying and selling, fluctuation in price, etc., are caused. At present, the research on influence factor of circulation efficiency of agricultural products is focusing on what specific factor indexes are, and methods...
of regression analysis, etc are mostly adopted to discuss the correlation between influence factor and circulation efficiency value. Based on existing researches on influence factor of circulation efficiency by scholars, the paper attempts to estimate each factor affecting circulation efficiency of Gannan navel orange; thus, the practical level of each circulation condition on Gannan navel orange may relatively and objectively be understood to provide decision basis for promotion of circulation efficiency of Gannan navel orange.

Starting point of the paper is to: make survey for and interview experts and scholars in the field of agricultural products circulation as well as relevant organizers participating in practice of circulation of Gannan navel orange; obtain judgments of them on level of each factor affecting circulation efficiency of Gannan navel orange; find out existing main factors restricting circulation efficiency of Gannan navel orange, and finally put forward countermeasures and suggestions to improve circulation efficiency of Gannan navel orange. Relevant experts, scholars and main organizers in the practical field have a certain in-depth knowledge and understanding for circulation condition of Gannan navel orange, all of whom may give evaluation from a relatively objective perspective.

1. Model construction.

1.1. Construction of index system. According to theories relevant to agricultural products circulation and by using relevant research achievements at home and abroad for reference, the paper will emphatically adopt the index system for influence factor of circulation efficiency constructed by [11] in his research, and it is shown as Table 1. Mainly based on “influence factor on circulation channel efficiency of Chengdu kiwi fruit” researched by her, there are some similarities both in the level of research and the characteristic of research objects (kiwi fruit and navel orange both belong to fresh fruits). In addition, combined with hot topics in the field of circulation of fresh agricultural products in recent years, the research has made certain supplements for index system specifically including that: the “fruit seasonality” of class-2 index is added under “fruit factor” of class-1 index; the “infrastructure construction of cold chain” of class-2 index is added under “infrastructure construction of logistics” of class-1 index; the “degree of market activity” of class-2 index is added under “market environment” of class-1 index, and the “food safety policy” of class-2 index is added under “policy environment” of class-1 index.

The index system comprehensively investigates the condition on overall level of influence factor of circulation efficiency of Gannan navel orange mainly from five dimensions of fruit factor, quality level of participant, infrastructure construction of logistics, market environment and policy environment. It can be seen that the index system may make evaluation for relevant factors affecting circulation efficiency of navel orange both from internal conditions and external environment of circulation of Gannan navel orange. Index on fruit factors has fully reflected the influence of fresh characteristic of agricultural product of navel orange on circulation efficiency, in which fruit seasonality mainly reflects the degree of demand for centralized listing within short period of fruit. What is reflected by quality level of participant is the influence of subject scale and professional level, etc on circulation efficiency of navel orange, and three dimensions including the infrastructure construction of logistics, market environment and policy environment are used for surveying external factors affecting circulation of Gannan navel orange from the relatively macroscopical level.
Table 1. Index System for Influence Factor of Circulation Efficiency of Gannan Navel Orange

| Class-1 index | Class-2 index |
|---------------|---------------|
| Fruit factor C₁ | Fruit seasonality c₁₁ |
| Quality level of participant C₂ | Scale of participant c₂₁ |
| Logistics professionalization quality level c₂₃ | Capability of getting information c₂₂ |
| Traffic transportation facility construction c₃₁ | Logistics professionalization quality level c₂₃ |
| Trading place construction c₄₂ | Infrastructure construction of cold chain c₃₅ |
| Warehousing facility construction c₃₃ | Information spreading network construction c₃₄ |
| Agricultural industry investment policy c₅₁ | Degree of market opening c₄₁ |
| Charge policy for agricultural products circulation c₅₂ | Degree of fair transaction c₄₂ |
| Food safety policy c₅₃ | Degree of market activity c₄₃ |

1.2. Selection of evaluation method. The paper will carry out research combined with Delphi method and analytic hierarchy process (AHP). Between them, Delphi method shall be used for empowerment of index system and grading to each index; while the analytic hierarchy process is mainly used for analysis and processing of data. The above methods may better combine qualitative analysis with quantitative analysis, and simultaneously take fully practical operation condition of evaluation object into consideration.

1.2.1. Establishment of hierarchy structure model. Combined with index system in Section 2.1, the hierarchy structure model with AHP is constructed, which is shown as Figure 1. From the figure, we can know that the set of sub-object factor for evaluation on level of influence factor of circulation efficiency of Gannan navel orange is that: $A = \{A_1, A_2, A_3, A_4, A_5\} = \{\text{fruit factor, quality level of participant, infrastructure construction, market environment, policy environment}\}$; while corresponding set of factor of class-2 evaluation is that $A_1 = \{a_{11}, a_{12}, a_{13}, a_{14}\} = \{\text{fruit factor, quality level of participant, infrastructure construction, market environment, policy environment}\}$.
seasonality, fruit storability, demand for initial processing of fresh fruit, consumption preference). In a similar way, the set of factor of evaluation of $A_2, A_3, A_4, A_5$ may be obtained.

**Table 2. 1-9 Scale Method and Definition**

| Scale | $x_i, x_j$ pairwise comparison standard |
|-------|----------------------------------------|
| 1     | $X_i$ and $X_j$ is equal in importance |
| 3     | $X_i$ is weakly important than $X_j$   |
| 5     | $X_i$ is obviously important than $X_j$|
| 7     | $X_i$ is strongly important than $X_j$ |
| 9     | $X_i$ is extremely important than $X_j$|
| 2, 4, 6, 8 | Mid-value of the above two adjacent judgments $a_{ji} = 1/a_{ij}$ |

Reciprocal $a_{ij}$ is the comparison judgment between factor i and j, and the comparison judgment between factor i and j that $a_{ji} = 1/a_{ij}$. 

**Figure 1. Hierarch Structure Model for Evaluation on Level of Influence Factor of Circulation Efficiency of Gannan Navel Orange**
A NONLINEAR EMPIRICAL ANALYSIS ON INFLUENCE FACTOR

\[ A = \begin{bmatrix}
1 & X_1/X_2 & \cdots & X_1/X_n \\
X_2/X_1 & 1 & \cdots & X_2/X_n \\
\vdots & \vdots & \ddots & \vdots \\
X_n/X_1 & X_n/X_2 & \cdots & 1
\end{bmatrix} \tag{1-1} \]

Later, calculate the initial weight coefficient \( w_i' \) and normalized weight coefficient \( w_i \) according to formulas (1-2) and (1-3).

\[ w_i' = \sqrt[n]{a_{i1}a_{i2}\cdots a_{in}} \tag{1-2} \]

\[ w_i = w_i' / \sum_{i=1}^{n} w_i' \tag{1-3} \]

1.2.3. Single hierarchical arrangement and consistency check. When using the analytic hierarchy process, it is frequently necessary to further check to see whether the weight coefficient obtained via calculation conforms to logic and has no difference after normalization of weight coefficient. In general, adopt random consistency ratio where \( CR = \frac{CI}{RI} \) to judge the consistency of order. When \( CR < 0.1 \), it is generally considered that the judgment matrix has satisfactory consistency. Among them, \( RI \) is random consistency index, and corresponding value is shown as Table 3; the calculation process \( CI \) is shown as the following formulas (1-4), (1-5) and (1-6). \( n \) is the sub-object number in hierarchy to be checked; \( \lambda_{\text{max}} \) is the maximum characteristic root, and \( \lambda_i \) is the characteristic root of judgment matrix with pairwise comparison of sub-object in this hierarchy.

\[ CI = \frac{\lambda_{\text{max}} - n}{n - 1} \tag{1-4} \]

\[ \lambda_{\text{max}} = \sum_{i=1}^{n} \lambda_i / n \tag{1-5} \]

\[ \lambda_i = \sum_{j=1}^{n} a_{ij} w_j / w_i \tag{1-6} \]

Table 3. Value of Average Random Consistency Index (0th and 10th order)

| n   | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
|-----|----|----|----|----|----|----|----|----|----|----|
| RI  | 0  | 0  | 0.58 | 0.90 | 1.12 | 1.24 | 1.32 | 1.41 | 1.45 | 1.49 |

1.2.4. Establishment of judgment set and calculation of degree of membership of judgment results in each index hierarchy. Interview and make questionnaire survey for subjects participating in circulation of Gannan navel orange (including leading enterprises for Gannan navel orange and agricultural specialized cooperatives, etc.) and relevant principals of Ganzhou Agricultural Development Bureau, and invite them to grade the level of each factor affecting circulation of Gannan navel orange from class-1 to class-5, which means grading according to five classes of \{5 scores, 4 scores, 3 scores, 2 scores, 1 score\} corresponding to performance level of factors of being “very good, good, common, poor, very poor”, and then making statistics on vote-getting condition of each class and judgment results of each hierarchy.
2. Model calculation. When evaluating weighting of index system, the research in the chapter has selected 5 experts and scholars for logistics management major in famous colleges and universities, and they have been invited to research empowerment of relevant indexes. The final judgment matrix of index weight contains 5 judgment matrixes of class-2 index weight of \((A_1, A_2, A_3, A_4, A_5)\) and 1 judgment matrix of class-1 index weight of \((A)\). Further integrate formulas (1-2) and (1-3) to calculate each index weight.

\[
A_1 = \begin{bmatrix}
  a_{11} & a_{12} & a_{13} & a_{14} \\
  a_{11} & 1 & 1/3 & 2 & 3 \\
  a_{12} & 3 & 1 & 2 & 3 \\
  a_{13} & 1/2 & 1/2 & 1 & 2 \\
  a_{14} & 1/3 & 1/3 & 1/2 & 1 \\
\end{bmatrix},
\]

weight \( W_1 = (0.2599 \ 0.4502 \ 0.1838 \ 0.1061) \)

\[
A_2 = \begin{bmatrix}
  a_{21} & a_{22} & a_{23} & a_{24} \\
  a_{21} & 1 & 2 & 1/2 & 3 \\
  a_{22} & 1/2 & 1 & 1/3 & 2 \\
  a_{23} & 2 & 3 & 1 & 4 \\
  a_{24} & 1/3 & 1/2 & 1/4 & 1 \\
\end{bmatrix},
\]

weight value \( W_2 = (0.2776 \ 0.1603 \ 0.4668 \ 0.0953) \)

\[
A_3 = \begin{bmatrix}
  a_{31} & a_{32} & a_{33} & a_{34} & a_{35} \\
  a_{31} & 1 & 3 & 2 & 1/2 & 1 \\
  a_{32} & 1/3 & 1 & 1/2 & 1/4 & 1/3 \\
  a_{33} & 1/2 & 2 & 1 & 1/3 & 1/2 \\
  a_{34} & 2 & 4 & 3 & 1 & 2 \\
  a_{35} & 1 & 3 & 2 & 1/2 & 1 \\
\end{bmatrix},
\]

weight value \( W_3 = (0.2154 \ 0.0735 \ 0.1208 \ 0.3749 \ 0.2154) \)

\[
A_4 = \begin{bmatrix}
  a_{41} & a_{42} & a_{43} \\
  a_{41} & 1 & 3 & 1/4 \\
  a_{42} & 1/3 & 1 & 1/5 \\
  a_{43} & 4 & 5 & 1 \\
\end{bmatrix},
\]

weighed value \( W_4 = (0.2255 \ 0.1007 \ 0.6738) \)

\[
A_5 = \begin{bmatrix}
  a_{51} & a_{52} & a_{53} \\
  a_{51} & 1 & 4 & 3 \\
  a_{52} & 1/4 & 1 & 1/3 \\
  a_{53} & 1/3 & 3 & 1 \\
\end{bmatrix},
\]

weighted value \( W_5 = (0.6144 \ 0.1172 \ 0.2684) \)

\[
A = \begin{bmatrix}
  A_1 & A_2 & A_3 & A_4 & A_5 \\
  A_1 & 1 & 3 & 1/2 & 3 & 1 \\
  A_2 & 1/3 & 1 & 1/5 & 1 & 1/3 \\
  A_3 & 2 & 5 & 1 & 5 & 2 \\
  A_4 & 1/3 & 1 & 1/5 & 1 & 1/3 \\
  A_5 & 1 & 3 & 1/2 & 3 & 1 \\
\end{bmatrix},
\]

weighted value \( W = (0.2197 \ 0.0760 \ 0.4086 \ 0.0760 \ 0.2197) \)

According to formulas (1-4), (1-5) and (1-6), calculate the consistency index \( CI \) of judgment matrix, and further obtain random consistency ratio \( CR \) of each
A NONLINEAR EMPIRICAL ANALYSIS ON INFLUENCE FACTOR

judgment matrix by integrating corresponding random consistency index $RI$ with same order, which is shown as Table 4. $CR$ value of each matrix is less than 0.1, and it is thus clear that the above index weight obtained from grading by experts is effective.

Table 4. Results of Random Consistency Check

|      | A   | A\(_1\) | A\(_2\) | A\(_3\) | A\(_4\) | A\(_5\) |
|------|-----|---------|---------|---------|---------|---------|
| $CI$ | 0.0013 | 0.0546 | 0.0103 | 0.0083 | 0.0429 | 0.0368 |
| $RI$ | 1.12 | 0.90 | 0.90 | 1.12 | 0.58 | 0.58 |
| $CR$ | 0.0012 | 0.0607 | 0.0115 | 0.0074 | 0.0739 | 0.0634 |

Interview and make questionnaire survey for Ganzhou Agricultural Development Bureau and relevant principals of specialized cooperatives, leading enterprises and large dealers for Gannan navel orange, and invite them to grade the level of each factor affecting circulation efficiency of Gannan navel orange from class-1 to class-5. At the time of field survey, interview and make questionnaire for thirty related personnel in total. Later, make statistics on distribution condition of class evaluation of interviewee on each index. Summary for weight and evaluation results on influence factor index of circulation efficiency of Gannan navel orange is shown as Table 2.

Table 5: Summary of Data of Index System for Influence Factor of Circulation Efficiency of Gannan Navel Orange

| The first hierarchy | The second hierarchy | Class distribution |
|---------------------|---------------------|--------------------|
| Index | Weight | No. | Index | Weight | No. | Very good | Good | Common | Poor | Very poor |
| Fruit factor A\(_1\) | | | Fruit seasonality a\(_{11}\) | 0.2599 | 0.00 | 0.00 | 0.17 | 0.47 | 0.37 |
| | | | Fruit storability a\(_{12}\) | 0.4502 | 0.03 | 0.07 | 0.40 | 0.33 | 0.17 |
| | | | Demand for initial processing of fresh fruit a\(_{13}\) | 0.1838 | 0.00 | 0.17 | 0.73 | 0.10 | 0.00 |
| | | | Consumption preference a\(_{14}\) | 0.1061 | 0.10 | 0.33 | 0.53 | 0.03 | 0.00 |
| Quality level of participant A\(_2\) | | | Scale of participant a\(_{21}\) | 0.2776 | 0.00 | 0.27 | 0.50 | 0.17 | 0.07 |
| | | | Capability of getting information a\(_{22}\) | 0.1603 | 0.07 | 0.17 | 0.27 | 0.33 | 0.17 |
| | | | Logistics professionalization quality level a\(_{23}\) | 0.4668 | 0.03 | 0.23 | 0.23 | 0.33 | 0.17 |
| | | | Mutual cooperation level a\(_{24}\) | 0.0953 | 0.07 | 0.17 | 0.43 | 0.23 | 0.10 |
| Infrastructure construction of logistics A\(_3\) | | | Traffic transportation facility construction a\(_{31}\) | 0.2154 | 0.10 | 0.33 | 0.27 | 0.20 | 0.10 |
| | | | Trading place construction a\(_{32}\) | 0.0735 | 0.00 | 0.13 | 0.30 | 0.43 | 0.13 |
| | | | Warehousing facility construction a\(_{33}\) | 0.1208 | 0.03 | 0.10 | 0.27 | 0.40 | 0.20 |
| | | | Information spreading network construction a\(_{34}\) | 0.3749 | 0.17 | 0.23 | 0.40 | 0.13 | 0.07 |
| | | | Infrastructure construction of cold chain a\(_{35}\) | 0.2154 | 0.00 | 0.00 | 0.23 | 0.50 | 0.27 |
| Market environment A\(_4\) | | | Degree of market opening a\(_{41}\) | 0.2255 | 0.27 | 0.47 | 0.20 | 0.07 | 0.00 |
| | | | Degree of fair transaction a\(_{42}\) | 0.1007 | 0.23 | 0.53 | 0.20 | 0.03 | 0.00 |
| | | | Degree of market activity a\(_{43}\) | 0.6738 | 0.03 | 0.13 | 0.43 | 0.30 | 0.10 |
Judgment results and overall evaluation results of factors with different hierarchies are calculated through weight and hierarchical distribution, which is shown as follows.

\[
A_1' = \begin{bmatrix}
0.0256 & 0.0960 & 0.4148 & 0.2933 & 0.1703 \\
0.0326 & 0.2255 & 0.3318 & 0.2775 & 0.1326 \\
0.0881 & 0.1812 & 0.3119 & 0.2809 & 0.1379 \\
0.1061 & 0.2488 & 0.3572 & 0.2205 & 0.0647 \\
0.0936 & 0.999 & 0.3322 & 0.1922 & 0.0820 \\
0.0727 & 0.1971 & 0.3439 & 0.4631 & 0.1270 \\
\end{bmatrix}
\]

3. Result analysis. According to above judgment results and overall evaluation results on each hierarchy and combined with previous comment set of being \{very good, good, common, poor, very poor\}, the membership condition of each comment is summarized and analyzed, which is shown as Table 6.

| Factor set | Very good | Good | Common | Poor | Very poor | Good and over | Common and over |
|------------|-----------|------|--------|------|-----------|---------------|----------------|
| A          | 0.0727    | 0.1971 | 0.3439 | 0.4631 | 0.1270    | 0.2698         | 0.6137         |
| A_1        | 0.0256    | 0.0960 | 0.4148 | 0.2933 | 0.1703    | 0.1216         | 0.5364         |
| A_2        | 0.0326    | 0.2255 | 0.3318 | 0.2775 | 0.1326    | 0.2581         | 0.5899         |
| A_3        | 0.0881    | 0.1812 | 0.3119 | 0.2809 | 0.1379    | 0.2692         | 0.5811         |
| A_4        | 0.1061    | 0.2488 | 0.3572 | 0.2205 | 0.0674    | 0.3549         | 0.7121         |
| A_5        | 0.0936    | 0.2999 | 0.3322 | 0.1922 | 0.0820    | 0.3936         | 0.7258         |

In the view of overall level of influence factor of circulation efficiency of Gannan navel orange and from Table 6, it can be known that the degree of membership evaluated as being “very good” is only 0.0727, which means that 7.27% of interviewees think the circulation condition of Gannan navel orange is very good; the degree of membership evaluated as being “poor” is the highest (0.4631), and we can know that most of interviewees are not satisfied with level of influence factor of circulation efficiency of Gannan navel orange. On the whole, 61.37% of interviewees think that the circulation condition of Gannan navel orange has reached common level and over, and this result relatively coincides with current condition on circulation of Gannan navel orange. Although the planting scale and output of Gannan navel orange has been presenting promotion with a certain proportion in recent
years, there are still many problems existing to affect the circulation efficiency of Gannan navel orange in the production and circulation links of navel orange, and next, evaluation results of specific factors will be successively analyzed.

3.1. **Fruit factor.** Statistical data shows that favorable degree of membership of fruit factor is relatively low (only 0.1216), and main grades are focused on two classes of being “common” and “poor”. Actually, the mature period of variety of navel orange in Ganzhou City centers on the first ten days of November; the harvest duration of mature fruit is short; demands for centralized listing is completely strong; the development of deep processing industry of navel orange is relatively slow, and most of navel oranges flow into market in the form of fresh fruit, all of which bring larger pressure to circulation of fresh fruit of navel orange. It is thus clear that improving variety structure of navel orange and further developing fruit processing industry may effectively mitigate influence of fruit factor on circulation of navel orange.

3.2. **Quality level of participant.** Statistical data shows that the degree of membership of ranking of quality level of participant has equilibrium distribution among three classes of being “common”, “good” and “relatively poor”. From the view of class-2 index, grades of subject scale and capability of getting information are lower. Although the channel and efficiency on information acquisition of subject of circulation of navel orange have been improved obviously than these in the past for the past few years, the information closely relevant to postharvest circulation of demands for consumer market of navel orange, etc is still quite blocked, and the production and operation of navel orange has blindness to a certain extent.

3.3. **Infrastructure construction of logistics.** From the view of evaluation results, the recognition degree of interviewee on level of such index is not high, and class-2 index with lower grade mainly centers on three aspects including construction of trading place, warehousing facility and facility of cold chain. Through the survey, it is found that with importance to aspects of road traffic and information network attached by Jiangxi Province in recent years, these two conditions have improved to a greater degree. However, the construction of trading place, warehousing facility and facility of cold chain closely related to circulation of Gannan navel orange lags behind relatively, which needs to be further strengthened.

3.4. **Market environment.** Statistical data shows that the level of such index in evaluation results is obviously superior to previous three indexes, and what pulls down level of overall index is mainly class-2 index (namely degree of market activity). Field survey has indicated that as a leading agricultural product of Ganzhou City, Gannan navel orange has many subjects participating in its market transaction, and in the process of market transaction, there is no strongly trending market accessing to the doorsill or phenomenon of unfair transaction. Main problems are that professional trading market for Gannan navel orange is still lack at present, and the existing market system has not fully exerted its important effects as commodity distributing center, platform for quality supervision and information hinge.

3.5. **Policy environment.** Policy environment is an important factor affecting any industry development, and relevant policies and regulations of Jiangxi Province and Ganzhou City has also been driving the development of navel orange industry with importance to agricultural production circulation attached by national level in recent years, especially to production circulation of fresh agricultural products.
Grading results of interviewees on policy environment show that the degree of membership of being common and over reaches 0.7258, which has the highest grade on evaluation of degree of membership among five influence factors. In the aspect of policy environment, main index of low evaluation lies in relevant safe policies. In the past few years, adverse events including non-conforming fruit quality and brand image damaged, etc have frequently broken out for Gannan navel orange, and it is urgent necessary to issue relevant laws and regulations on food safety to restrain and standardize market operation behaviors of related subjects.

4. Conclusion and suggestion. Combined with analytic hierarchy process (AHP) and Delphi method, the level evaluation and analysis on main factors affecting circulation efficiency of Gannan navel orange have been carried out. Research shows that the overall level of influence factor of circulation efficiency of Gannan navel orange is common. Specially, strong fruit seasonality, poor fruit storability, intense demand for initial processing, relatively small scale of participant, weak capability of getting information, low logistics professionalization quality level, backward construction of trading place/warehousing facility/infrastructure of cold chain, lower degree of market activity and lack of food safety policy, etc are main factors restricting high-efficient circulation of Gannan navel orange.

Based on the above research conclusion, the following suggestions are proposed to promote circulation efficiency of Gannan navel orange.

4.1. Enterprise level. Firstly, from the production link, optimize variety of navel orange; reasonably arrange structure of fruit industry; comprehensively develop series citrus products; mitigate contradiction of centralized listing and fluctuation in seasonal price of fresh fruit of navel orange; strengthen promotion and application of planting technology; improve level of orchard management, and boost construction of standard orchard. Secondly, from storage, transportation and processing links, improve level of commercialized processing of navel orange fruits after plucking; reasonably arrange commercialized processing production line after plucking; weaken pressure of fresh sales; improve storage and preservation technology and facility level; reasonably plan storage of fresh fruits, and realize fruit balance listing. Thirdly, from the marking link, continue strengthening construction of visible market, especially construction of professional wholesale market or logistics park of Gannan navel orange; exert its important effect in the aspects of navel orange transaction, distribution, price formation, regulation of supply and demand and information exchange, etc; guide well-aligned circulation of fruits; actively explore diversified direct market models; reduce some unnecessary circulation transfer links; expand area for navel orange sales; quicken marketability of navel orange; give full play to subject effect of leading enterprise; cultivate main role of brand culture; release potential capability of cooperatives for fruit industry, and develop its important roles in the aspects of organization of retail investor, information spreading, technology guidance and sales promotion, etc. Finally, beginning with brand construction, carry out thematic education activity; improve responsibility consciousness of fruit safety; intensify self-supervision action of circulation subjects and organizations; optimize method of brand publicity; exert subjective initiative of subject publicity, promotion and brand protection of enterprise; promote popularity and influence of brand of Gannan navel orange; establish anti-fraud mechanism for rights
safeguard of brand; intensify protection of geographical indication brands, and completely improve the anti-fraud dual mechanism for rights safeguard of protection of brand of production place and brand of sales place.

4.2. Government level. Firstly, emphatically focus on product safety; increase supervision force of agricultural capital goods market; effectively control use of input of navel orange from source; guarantee industry safety of navel orange; intensify quarantine and inspection of fruits; strictly prevent fruits not conforming to food safety from flowing into market, and establish emergency response mechanism for disastrous safety contingencies to minimum impact of disastrous contingencies on navel orange industry. Secondly, completely improve policy and service system, policy guidance and promotion; do well in scientific production and marketing plan of navel orange; guide production factors of talents, technology and fund, etc to flow towards industry of Gannan navel orange; make input mechanism, reasonable planning and special funds with comprehensive arrangement perfect; encourage financing institutions involving in agriculture to reduce credit doorsill; widen scope of credit; innovate credit products and service methods; support development of industry of Gannan navel orange; enrich form of cooperative economic organization; actively explore and guide to organize cooperative economic organizations which practically present benefits of fruit grower; provide all kinds of production operation technologies, real-time dynamic market information for them, and develop order-based agriculture.

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