Prevention of Agricultural Market Risks by Agricultural Production Entities in Hubei Province

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Abstract Different agricultural production and operation entities face the same market risks. Since there is a huge gap in market risk prevention ability between agricultural market operation entities, the gap of risk prevention effect is huge. Using statistical analysis and comparative analysis methods, this paper analyzed characteristics and influencing factors of agricultural market risks and pointed out characteristics of agricultural market and special characteristics of agricultural production and operation entities in Hubei Province. Based on SWOT analysis on market risk prevention ability of agricultural production and operation entities in Hubei Province, it came up with three recommendations, including upgrading agricultural production and operation entities, enlarging the production and operation scale, and strengthening the ability of balancing the market demand and supply and bargaining power and pricing power.

Key words Agricultural production entities, Agricultural risks, Market risks, Prevention ability

1 Introduction
Mountains and hills account for about 70% of China's land area. Due to low agricultural mechanization, China's agricultural production and operation entities are mainly farmers. Under market economy, market entities operate independently and assume sole responsibility for its profits or losses. Agricultural risk is an inevitable problem faced by agricultural production and operation entities in autonomous operation. How to effectively carry out risk management determines the profit and loss of agricultural production and operation. Located in the core area of the Yangtze River Economic Belt, Hubei is an important production area and distribution area of agriculture, forestry, animal husbandry and fishery. However, because agricultural production and operation entities of Hubei Province are still traditional farmers, agricultural production and operation entities are weak in managing agricultural market risks. In this study, we discussed how to improve the agricultural market risk prevention ability of agricultural production and operation entities, so as to realize healthy development of agriculture, stable increase in farmers' income, and overall increase in social benefits.

2 Characteristics and influencing factors of agricultural market risks
2.1 Connotation and characteristics of agricultural market risks
Agricultural market risk is a kind of market risk. Market risk refers to the possibility of economic profits and losses of market entities due to uncertainty of market factors in market transaction activities[1]. Like industrial products, agricultural products are used for market exchange, therefore, inevitably have the general market risk, and also have the unique risk of agricultural market.

(i) High decentralization of production and operation entities. Data show that by the end of 2014, more than 230 million farmers contracted nearly 1330 million mu farmland, accounting for 92% of rural collective farmland[2]. Calculated at the population of 1.35 billion, each production entity served about 6 people, showing high decentralization of agricultural production and operation entities, leading to risk of loss of pricing power. (ii) Long period of the process of input and output. The production of primary agricultural products follows the rules of life sciences. The growth period lasts several months to several years. Generally, the process of input and output is long and thus there is the risk of distortion of demand information. (iii) The production and demand information is asymmetry. Because the production of agricultural products is decentralized, the consumption demand of agricultural products is more decentralized, the demand information is extremely asymmetric, leading to the risk of excess of shortage of supply. (iv) High loss of agricultural products. Agricultural products have high loss, especially fresh agricultural products, and the loss of fresh agricultural products will cause the price to countermove, the higher the opposite loss, the lower the price, bringing about double risks of decline in both the price and sales. (v) Short-term imbalance between supply and demand. The supply of agricultural products is generally concentrated in the short term. Due to the imbalance between supply and demand, agricultural prices will rapidly decline, leading to the market risk of price decline. (vi) Price is not flexible. Most of the agricultural products are used to meet the biological needs and necessary physiological treatment period. The price drop will not stimulate rebounding of sales and could not solve the problem of decline in sales. However, the price drop will, to a certain extent, stimulate purchase in-
2.2 Influencing factors of agricultural market risks

(i) Market size. The market size is determined by demand and price. The market size of demand is determined by demand party, such as population. Market size is greatly influenced by product price, thus the price risk has a great influence in the market size. (ii) The relationship between cost price and product price. To obtain profit, the cost price must be lower than the product price. If the cost price is equal to or higher than the product price, there will be losses. The decentralization of agricultural production entities leads to loss of cost pricing power and product pricing power. If costs can not be changed, the product price becomes a decisive factor of market risk. (iii) The relationship between supply, demand and price. In the case of short supply, product price will rise; in the case of balanced supply and demand, the product price will decline; in the case of excess of supply over demand, the product price will decline. Therefore, in the case of constant demand, the supply situation will determine the product price level; conversely, the price changes will stimulate the changes in demand to a certain extent.

2.3 Characteristics of agricultural market in Hubei Province

2.3.1 Agricultural land. According to the land survey data of Hubei Province issued in 2014, the land use data of Hubei Province in 2014 were as follows: 5.323 million ha farmland, 0.4972 million ha garden land, 8.6649 million ha forest land, 0.2942 million ha grassland, and 2.0786 million ha water area and water conservancy facility land. In total, agricultural land reached 16.8579 million ha, and the percentage of farmland, forest land, grassland, and water area and water conservancy facility land to the agricultural land was 31.58%, 2.95%, 51.40%, 1.75% and 12.33% respectively. The percentage from high to low was the forest area, cultivated area, water area, garden area and grassland area.

### Table 1 Statistics of yield of main agricultural products of Hubei Province in 2014–2016 (unit: 10^4 t)

<table>
<thead>
<tr>
<th>Year</th>
<th>Grain</th>
<th>Cotton</th>
<th>Oil crops</th>
<th>Tea</th>
<th>Fruit</th>
<th>Vegetable</th>
<th>Aquatic products</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2584.16</td>
<td>35.95</td>
<td>341.90</td>
<td>25.03</td>
<td>614.28</td>
<td>3671.52</td>
<td>433.00</td>
</tr>
<tr>
<td>2015</td>
<td>2703.30</td>
<td>27.89</td>
<td>345.22</td>
<td>26.33</td>
<td>615.94</td>
<td>3848.64</td>
<td>455.50</td>
</tr>
<tr>
<td>2016</td>
<td>2554.11</td>
<td>18.85</td>
<td>329.75</td>
<td>19.61</td>
<td>649.72</td>
<td>4001.70</td>
<td>470.84</td>
</tr>
</tbody>
</table>


2.3.2 Agricultural products. Apart from the main agricultural products, Hubei Province had swine slaughter million, declining 3.2%, cattle slaughter 1.603 million, increasing 0.3%, sheep slaughter 5.554 million, increasing 0.9%, poultry 521.95 million, increasing 1.9%, egg production 1.678 million, increasing 1.5%, and honey, edible fungi, and lobster production ranked first in China. According to the data in Table 1 and data of non-primary agricultural products in 2016, grain and oil crops in primary agricultural products fluctuated, the cotton and tea declined, fruit and vegetable and aquatic products showed a rising trend, swine slaughter declined, cattle, sheep and chicken rose. These data reflected the optimization of industrial structure of Hubei Province, it gradually changed to agricultural products with high added value and short cycle. This will be a basic trend of agricultural development of Hubei Province.

3 Situations of agricultural production and operation entities in Hubei Province

3.1 Definition of agricultural market production entities

In general, agricultural market production entities are economic entities engaged in agricultural commodity production and operation for profit. According to qualification of market operation entities, agricultural market operation entities must have the essential qualification of general market operation entities, namely, the market operation qualification, actually dealing with operation activities with attribute of profit, and independently enjoying civil rights and assuming civil liabilities. Production and operation entities are basic parts of commercialization of entire agricultural products. Activities of production and operation entities determine satisfaction of market activities and market demands, and will be influenced by other entities. Production and operation entities mainly include family contractual households, moderate scale operation households, and agricultural cooperatives.

3.2 Overview of agricultural market operation entities

According to the permanent residence standard, there were 9.55 million farmers in Hubei Province in 2011. Taking the total farmland area in 2011 as the base number, the farmland per farmer was 0.315 ha, the maximum per capita farmland of agricultural moderate scale was 1.33 – 2.33 ha, agricultural operation entities and farmland area of Hubei Province in 2011 – 2016 were shown in Table 2. According to Table 2, the family contractual households gradually reduced, but there were still 5.7827 million households in 2016, accounting for 60.5% of farmers in Hubei Province, new agricultural production and operation entities of moderate scale operation were 0.5093 – 0.8923 million households, accounting for 8.1% – 12.3% of agricultural operation entities of Hubei Province, but the farmland area rose to 39.5%. In other words, traditional family contractual households still took up 86.6% – 91.9% of agricultural production and operation entities in Hubei Province, but the farmland area dropped to 60.5%. According to Table 3, agricultural cooperatives in Hubei Province increased rapidly from less than 20000 in 2011 to more than 70000 in 2016, increasing by 3.5 times, the average annual growth rate slowed down, but the net increase was great. This reflects that professional agricultural cooperatives in Hubei Province have great influence and are gradually changing the structure of agricultural production and operation entities, but the influence is still very limited at the current stage. Since traditional family households and new agricultural production and operation entities are free to join the professional agricultural
cooperatives, we can not take such cooperatives as independent production and operation entities. However, they exist in the form of operation entities, they rely on cooperative platform to partici-

Table 2: Information of farmland, farmland circulation, and operation entities in Hubei Province

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Circulation area/10^4 ha</td>
<td>40.67</td>
<td>57.15</td>
<td>79.62</td>
<td>98.36</td>
<td>108.87</td>
<td>118.67</td>
</tr>
<tr>
<td>Percentage to contractual farmland area/%</td>
<td>13.50</td>
<td>19.00</td>
<td>26.34</td>
<td>32.60</td>
<td>36.10</td>
<td>39.50</td>
</tr>
<tr>
<td>Current year farmland area/10^4 ha</td>
<td>301.26</td>
<td>300.79</td>
<td>302.28</td>
<td>301.72</td>
<td>301.58</td>
<td>300.43</td>
</tr>
<tr>
<td>New agricultural production entities/10^4 households</td>
<td>17.45 - 30.58</td>
<td>24.53 - 42.97</td>
<td>34.17 - 59.86</td>
<td>42.21 - 73.95</td>
<td>46.73 - 81.86</td>
<td>50.93 - 89.23</td>
</tr>
<tr>
<td>Theoretical transfer of households/10^4 households</td>
<td>129.11</td>
<td>181.43</td>
<td>252.76</td>
<td>312.25</td>
<td>345.19</td>
<td>376.73</td>
</tr>
<tr>
<td>Theoretical surplus family contractual households/10^4 households</td>
<td>825.89</td>
<td>773.57</td>
<td>702.24</td>
<td>652.75</td>
<td>609.81</td>
<td>578.27</td>
</tr>
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</table>


Table 3: Statistics of professional agricultural cooperatives in Hubei Province (2011 – 2016)

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Number of households</td>
<td>19611</td>
<td>27753</td>
<td>39591</td>
<td>50420</td>
<td>60741</td>
<td>70521</td>
</tr>
<tr>
<td>Net increase over the previous year</td>
<td>–</td>
<td>8142</td>
<td>11838</td>
<td>10829</td>
<td>10321</td>
<td>9780</td>
</tr>
<tr>
<td>Growth rate/%</td>
<td>62.3</td>
<td>41.5</td>
<td>42.7</td>
<td>27.4</td>
<td>20.5</td>
<td>16.1</td>
</tr>
</tbody>
</table>


4 SWOT analysis on agricultural market risk prevention ability of agricultural operation entities in Hubei Province

4.1 Market risk prevention ability of traditional farmers in Hubei Province (i) Strength. Traditional farmers occupy about 60% of the farmland, so they still determine the size of the market supply, they do not need to pay land costs and labor costs, and product price stability is high with small elasticity. (ii) Weakness. Traditional farmers are excessively decentralized, the means of production are mainly retailing, and the commercialization rate of product is about 50%. They are weak in pricing. The low mechanization leads to high opportunity cost of labor cost. (iii) Opportunity. They have equal market competition opportunity with other operation entities. (iv) Threat. There are following threats: rise in price of means of production, upgrade of demands of consumers for high quality agricultural products, and low labor cost and low product price brought about by high per unit area yield, high quality products, and mechanization. Through the analysis, we found that the traditional farmers are production and operation entities with equal opportunities but small strength and great weakness and threat, thus, their risk prevention ability is the lowest.

4.2 Market risk prevention ability of new agricultural operation entities in Hubei Province (i) Strength. The new agricultural operation entities are highly centralized, the farmland per households is about 4 – 7 times the traditional farmers; in the purchase of means of production, they have certain bargaining power, the yield per household is 5 – 10 times the traditional farmers, and the commercialization rate of products is nearly 100%. In the sales of products, they have higher pricing power; the high mechanization causes low labor cost, and high elasticity of product price brings large profit face. (ii) Weakness. New agricultural operation entities need to pay the cost of land circulation. (iii) Opportunity. They have equal market competition opportunity with other operation entities. (iv) Threat. There are threats of rise in price of means of production, supply of high quality agricultural products, preference of consumers, and purchasing power. Through the analysis, we found that new production and operation entities are production and operation entities with equal opportunities but great strength and small weakness and threat, thus, their risk prevention ability is strong.

4.3 Market risk prevention ability of market operation entities of professional agricultural cooperatives in Hubei Province (i) Strength. Because traditional farmers and new agricultural operation entities are free to join the professional agricultural cooperatives, the farmland scale, production scale, yield scale, and marketization rate reach the maximum, up to several hundred times the individual farmers. Professional agricultural cooperatives implement unified purchase of means of production, unified sales of products, and have great scale effect, so they have maximum bargaining power and pricing power. (ii) Weakness. Traditional farmers and new agricultural operation entities have high management cost. (iii) Opportunity. They have equal opportunities for market competition, and also have the opportunity to monopolize competition. (iv) Threat. There are problems of cooperators’ breach of contract and appearance of highly organized large and super high-tech agricultural companies. Because of high connection between supply of means of production, production, and market sales of cooperatives, the probability of breach of contract is relatively small. Few highly organized large and super high-tech agricultural companies get involved in the production, there will be no strong competition threat. Through the analysis, we found that market operation entities of professional agricultural cooperatives belongs to the production and operation entities with equal opportunities and monopoly competition opportunities, greatest strength, and smallest weakness and threats, thus their risk prevention ability is the highest.

5 Recommendations

5.1 Upgrading agricultural production and operation entities There are about 6.3 million to 6.7 million agricultural pro-
duction and operation entities in Hubei Province, and 5.78 million of them are farmers. In agricultural production and operation, they have little strength but great weakness, thus it is recommended to gradually reduce them, and energetically develop new agricultural operation entities, to realize "from small to large in number and from little to large in scale, and from weak to strong in competitiveness", until traditional households exit the market.

5.2 Enlarging the production and operation scale

The production scale of agricultural production and operation entities in Hubei Province is not large, the farmland area per household is about 0.315 ha, and the operation scale of new agricultural production and operation entities is only 1.33–2.33 ha, and the real scale is still not formed yet. To enlarge the production and operation scale, the present solution is household contractual operation mode. Through separate treatment of three rights of rural land, it is recommended to gradually transfer the contractual land to new agricultural operation entities. In addition, it is recommended to increase investment in science and technology and capital investment, so that the production scale and value scale can be further expanded.

5.3 Strengthening the ability of balancing the market demand and supply and bargaining power and pricing power

The reduction of operation entities will make the entire social coordination become relatively simple. In the whole society, the planned individual production and unplanned social production change to stronger planned individual production and entire social production. The production enters orderly competition from disorderly competition, then the plan strengthens the supply and demand balancing ability. The expansion of operation scale makes the operation entities have stronger purchasing and bargaining power because of larger scale of purchased means of production. Similarly, the scale operation of operation entities enlarges the product scale, improves the product quality, and makes them have higher product pricing power in sales of products.

References


(From page 14)

vel orange export risks, and establish special fund for navel orange export to alleviate pressure of export enterprises.

References


