



# Analysis on the Operation Model of Agribusiness: ADM Comparison with Beidahuang

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## Abstract

Both ADM (Archer Daniels Midland Company of USA) and Beidahuang play important role in domestic and international food markets, which are representatives of successful agribusiness. Their business transitions and operational models indicate a trend for future development. Furthermore, the development process of ADM can be an excellent example for Chinese food firms such as Beidahuang, which are carrying out the strategy of whole industry chain. As the global economy becomes more integrated, Chinese agribusiness has to compete with large-scale multinational enterprises (such as ADM) at home and abroad. Possibly, ADM may become the partner of Beidahuang. Since large-scale multinational agricultural companies are essential to promote China's economy, it is meaningful to complete a comparison between ADM and Beidahuang. This research analyzed the external environment and industrial characteristics of ADM and Beidahuang, compared operation model of the two companies, which included seven elements: position in the industry chain, profit source, business combination, synergy or alliance, periodical transition, strategic layout, and risk management. At the end of this paper, it put forward some suggestions on how to implement the agribusiness in China and how to upgrade the core competency of the Chinese grain companies.

**Keywords:** Operation Achievement; Evaluation Index; Company Comparison; Countermeasure Suggestion

**Abbreviations:** ADM: Archer Daniels Midland.

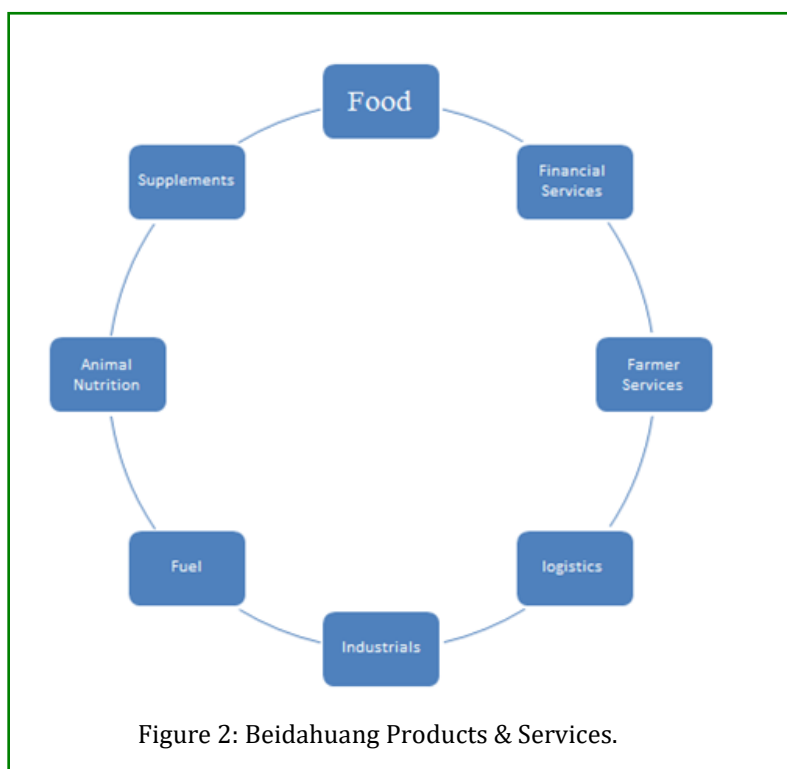
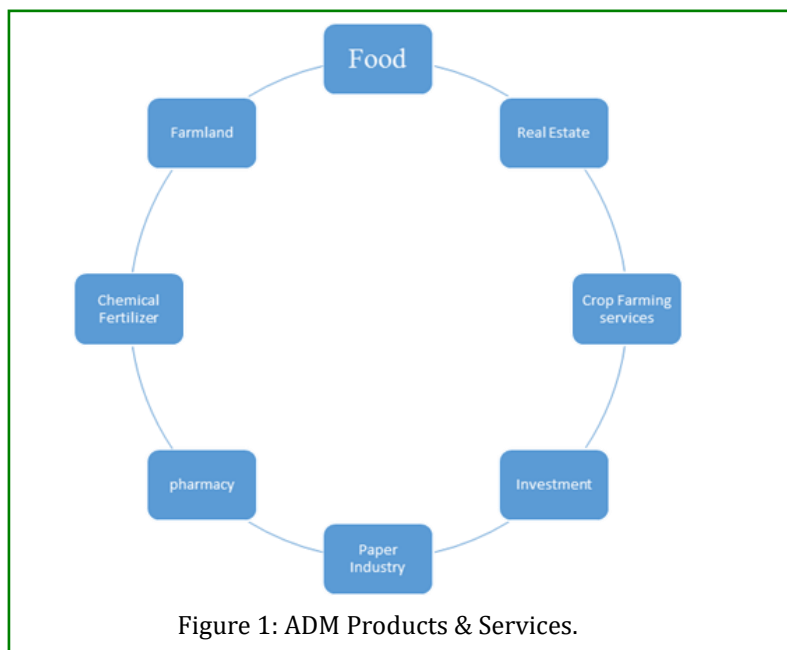
## Introduction

### ADM

ADM proudly states: "For more than a century, it has transformed crops into products that serve the vital needs

of a growing world. It is one of the world's largest agricultural processors and food ingredient providers, headquartered in Chicago, Illinois, with approximately 31,000 employees serving customers in more than 170 countries. With a global value chain that includes around 500 crop procurement locations, 270 ingredient manufacturing facilities, 44 innovation centers and the world's premier crop transportation network. It connects

the harvest to the home, making products for food, animal feed, industrial and energy uses” (Figure 1 and 2).



### Beidahuang

Beidahuang declares: “Beidahuang Group is China's largest agricultural and agribusiness group founded in

1948, with its headquarters in Harbin, capital of north China's Heilongjiang province. The group owns 29,088 square kilometers of farmland, 9,277 sq km of forest,

3,393 sq km of grassland and 2,587 sq km of water area, with pillar products, including rice, flour, potato, oil, dairy products, pork and pharmacy. The annual output reached 22.5 billion kilogram. The group has developed a series of well-known brands, including Beidahuang, Wondersun and Jiusan. It has also established partnership with businesses from more than 60 countries and regions worldwide and set up 26 overseas businesses in 13 countries and regions, including Russia, which borders with Heilongjiang province. There are a large number of uncultured fertile lands with few population in Russia, which provides an opportunity for Beidahuang to upgrade itself through international cooperation in agricultural field. Another example is Australia, which attracts Beidahuang by its organic green agricultural products

because there are more and more requirements for such products in China with its economic growth and increasing living standard of Chinese people."

### Company comparisons

#### Evaluation index system

To determine how the operations of ADM and Beidahuang compare, we analyze their financial structure to determine their overall strength. The essential analysis is the identification and selection of evaluation index of agribusiness development based on Gray Relational Analysis in order to compare the operation model between ADM and Beidahuang.

	Index	Computational Formula [1]
<b>Profitability</b>	Rate of return on total assets	total pretax profit ÷ total assets
	Return on net assets	net profit after interest and tax ÷ average net assets
	Earnings per share	net margin ÷ average balance of owner's equity
<b>Asset Quality</b>	Turnover of total capital	net operating revenue ÷ average total assets
	Turnover of current assets	net operating revenue ÷ average total liquidity
	Turnover of accounts receivable	sales revenue ÷ balance of average accounts receivable
<b>Debt Risk</b>	Liquidity ratio	current assets ÷ current liabilities
	Quick ratio	quick assets ÷ current liabilities
	Equity ratio	total indebtedness ÷ total owner's equity
<b>Operating Growth</b>	Growth rate of total assets	total asset growth in the year ÷ total assets at the beginning of the year
	Growth rate of net profit	net profit growth in the year ÷ total net profit of last year
	Growth rate of net assets	net asset growth at the end of the year ÷ net assets at the beginning of the year

Table 1: Evaluation Index of Operation Achievement.

### Factor analysis steps

Weight refers to the importance of an index relative to the evaluation target when comprehensive analysis is conducted by using the index system. It emphasizes the relative importance of a specific index and tends to contribute or be important. The weight of an index refers to its relative importance in the overall evaluation. Weight is the quantitative distribution of the importance of different aspects of the evaluated object, and the role of each evaluation factor in the overall evaluation is treated differently. In fact, when evaluating or analyzing a certain feature of an object, there must be focus. Without focus, it is not an objective evaluation. Therefore, we should give weight to each indicator when conducting financial performance analysis. On the basis of determining the index system, there are many ways to determine the weight, including subjective weighting method, objective weighting method and subjective and objective comprehensive weighting method. Subjective weighting

method mainly includes analytic hierarchy process, fuzzy method, fuzzy analytic hierarchy process and expert evaluation method. Objective weight method mainly includes principal component analysis method, entropy weight method, and deviation method and so on. The weight system determined by the subjective weighting method is highly arbitrary, and the results mainly reflect the intention of the decision maker. Once the decision maker changes, the weight coefficient of each index is likely to change accordingly. The objective weighting method is adopted to determine the weight coefficient among indicators, and the subjective component is abandoned. The decision-making or evaluation results have strong mathematical theoretical basis, which is more suitable for financial performance analysis of listed companies.

Therefore, this paper adopts entropy method to give weight. The entropy method includes three steps: data standardization, information entropy calculation and

weight calculation. The first step is data standardization. Because there are differences in dimensions and polarity of selected financial indicators, without data standardization, the accuracy of results may be affected to some extent. Therefore, data standardization should be carried out before model calculation. In this paper, min-max standardized data processing method is adopted. The second step is the calculation of entropy. Third, determine the difference coefficient of each index. The fourth step is

to calculate the weight value and determine the weight of each index in the comprehensive analysis [2].

### Analysis on Empirical Results

The data from the year of 2004 to 2017 have been chosen which came from the financial statements since both of the two agribusinesses are publicly traded companies.

Year	Rate of return on total assets	Return on net assets	Earnings per share	Turnover of total capital	Turnover of current assets	Turnover of accounts receivable	Liquidity ratio	Quick ratio	Equity ratio	Growth rate of total assets	Growth rate of net profit	Growth rate of net assets
2004	0.03	0.07	0.76	1.98	3.85	9.82	1.53	0.85	1.52	0.13	0.09	0.10
2005	0.06	0.13	1.59	1.89	3.59	8.83	1.81	1.08	1.21	-0.04	0.10	1.11
2006	0.07	0.14	2.00	1.84	3.40	8.54	1.92	1.16	1.17	0.14	0.16	0.26
2007	0.09	0.21	3.30	1.90	3.27	8.10	1.92	1.15	1.23	0.18	0.15	0.65
2008	0.06	0.15	2.79	2.25	3.44	7.81	1.74	1.05	1.75	0.48	0.20	-0.17
2009	0.05	0.13	2.65	2.02	3.09	7.36	2.18	1.31	1.34	-0.15	0.00	-0.05
2010	0.06	0.14	3.00	1.95	3.26	9.18	2.08	1.19	1.17	0.00	0.08	0.12
2011	0.05	0.12	3.13	2.19	3.52	10.12	2.08	1.17	1.24	0.34	0.29	0.05
2012	0.03	0.07	1.84	2.13	3.11	13.42	1.75	0.94	1.43	-0.12	-0.04	-0.38
2013	0.03	0.07	2.02	2.02	3.08	26.91	1.82	1.09	1.17	0.05	0.11	0.09
2014	0.05	0.11	3.43	1.85	2.98	27.40	1.67	1.07	1.24	0.01	-0.03	0.66
2015	0.04	0.10	2.98	1.61	2.83	30.48	1.62	1.01	1.24	-0.09	-0.09	-0.18
2016	0.03	0.07	2.16	1.56	2.91	34.23	1.60	0.93	1.31	-0.01	-0.04	-0.30
2017	0.04	0.09	2.79	1.53	2.97	31.58	1.59	0.86	1.18	0.00	0.07	0.24

Table 2: ADM.

Year	Rate of return on total assets	Return on net assets	Earnings per share	Turnover of total capital	Turnover of current assets	Turnover of accounts receivable	Liquidity ratio	Quick ratio	Equity ratio	Growth rate of total assets	Growth rate of net profit	Growth rate of net assets
2004	0.05	0.11	0.3	0.39	0.64	5.86	1.22	0.79	1.09	0.13	0.06	0.17
2005	0.05	0.12	0.28	0.44	0.74	8.83	1.18	0.61	1.12	0.12	0.1	0.1
2006	0.06	0.13	0.33	0.51	0.92	8.8	0.96	0.47	1.43	0.0043010.09	-0.13	0.07
2007	0.05	0.13	0.33	0.54	0.99	7.25	1.19	0.69	1.15	0.09	0.09	0.03
2008	0.05	0.12	0.33	0.54	1.03	6.78	1.15	0.57	0.89	-0.03	0.14	0.02
2009	0.03	0.06	0.19	0.59	1.14	8.34	1.03	0.5	1.19	0.18	0.05	-0.41
2010	0.02	0.06	0.2	0.62	1.02	11.39	1.06	0.48	1.9	0.49	0.13	0.07
2011	0.02	0.07	0.24	0.74	1.16	12.54	0.95	0.46	1.92	0.01	0.05	0.22
2012	-0.02	-0.05	-0.18	0.81	1.35	11.57	0.87	0.4	1.85	-0.13	-0.11	-1.75
2013	-0.03	-0.08	-0.29	0.64	1.16	10.15	0.85	0.41	1.78	-0.12	-0.09	-0.6
2014	0.07	0.14	0.41	0.46	0.95	11.45	1.33	0.8	0.46	-0.41	0.13	2.42
2015	0.08	0.12	0.35	0.47	1.2	27.3	1.57	0.92	0.31	-0.12	-0.12	-0.14
2016	0.1	0.13	0.4	0.41	1.05	42.43	1.61	1.18	0.35	0.07	0.03	0.15
2017	0.1	0.13	0.43	0.39	0.95	59.62	1.81	1.35	0.29	-0.01	0.03	0.07

Table 3: Beidahuang.

The negative results showed in growth rate can be explained as follows:

### Strong profitability

Profitability refers to the ability of an enterprise to obtain economic profits and realize capital appreciation by using certain economic resources in a certain period of time. It is the comprehensive embodiment of an enterprise's marketing ability, cash acquisition ability, cost reduction ability and risk aversion ability, and it is also the specific performance of business results in all aspects of the enterprise. The good or bad operation of an enterprise will be shown through its profitability. Beidahuang mainly relies on land contracting and agricultural products sales to obtain profits, which has the characteristics of stable income and low cost. All benefit from the wilderness of the superior natural conditions, Beidahuang is located in heilongjiang province in China, the land is fertile, flat, cultivated land, the scale, development of agricultural mechanization, integration is very good, but the wild the company product publicity is not high, sales range is narrow, and product sales business cost is higher, so this paper argues that although the Beidahuang company ranked in the same industry's profitability, but still have development space in terms of profitability.

### Unreasonable capital structure

Reasonable arrangement of debt capital ratio can reduce the comprehensive capital cost rate of enterprises, obtain financial leverage benefits, and ultimately increase the value of the company. However, in terms of debt capital ratio, the asset-liability ratio of Beidahuang is very low, which indicates that Beidahuang Company's debt is relatively small compared with the total assets, the owner's equity accounts for a large proportion, and the company's leverage ability is poor. It reflects that the debt ratio of Beidahuang company is low, indicating that its capital cost ratio is high and it cannot use financial leverage to reduce capital cost reasonably and effectively.

### Countermeasure suggestions

#### Whole industry chains

Although it seems that there are some similarities of the whole industry chain between the two companies, there are differences in nature which are as follows.

**System of Warehousing and Logistics:** Comparing with Beidahuang, the logistics system of ADM has huge advantages: the transportation team includes more than 20,000 trains, 2,250 barges and 1,500 container trucks, which connects 500 grain storage elevators and

over 240 finished factories. At the same time, ADM has already established many warehousing and logistics companies in China's cities such as Qinhuangdao, Yantai and Lianyungang, so customers like to choose ADM because of its strong logistics management capability to a great extent. As for Beidahuang, the bulk cargo is transported to the ports of north China such as Dalian by rail and vehicle, then to the ports of south China such as Guangdong province by ship, the transportation cost is 35% of total sale cost. From Table 4 of logistical infrastructure comparison between the two companies, it is obvious that ADM is an international agribusiness by sea transportation abroad and rail transportation in domestic China, while the main business of Beidahuang is in domestic.

**Integration process of industry chain:** ADM integrates its industry chain from upstream to downstream, while Beidahuang is opposite. Beidahuang tries to build the business model of Whole Industry Chain in order to acquire integral competitive superiority through its core competence. But the whole industry chain doesn't mean for a company to control the every operation part in the chain, it should be turned into the founder and leader by controlling the key part of the industry chain. Beidahuang lacks of the ability of being raw materials between each product and multi-level deep and fine processing of products. At this point, The strategy of Beidahuang should be making good use of its relative strength such as resource strength which is the biggest scale crop farming publicly traded company with the highest level of modernization and the important commodity grain base in China; strength of science and technology through cooperation with universities and research institutes; strength of agricultural machinery with advanced world level which were imported from developed countries; strength of human resource who are good at knowledge and experience [3].

**Brand food business:** The mature market in Europe and America began to separate the food business from the crop processing business. The border among crop trade business, processing industry and food production industry becomes more and more obvious, the main reason of such situation is the essential difference of operations between two companies. It is well known that ADM doesn't pay attention to the brand food, while Beidahuang is famous for some brand foods because it is quite familiar with the consumption demands of China and it also obtains policy support from Chinese government.

**Customer demands and consumption demands:** Beidahuang is highly influenced by government policy



during its development. With the decrease of trade business and the increase of entity business, the operation consciousness is transferring from policy-orientation into product-orientation. However, confronted with current economic situation and market competition, both of the orientations have become the obstacle for Chinese agricultural companies to take part in market competition. The whole product chain emphasizes consumption-orientation, so Beidahuang established an operation system based on terminal consumption-oriented demands in order to satisfy the growing material demands of Chinese people through optimizing business assemble, operation pattern and business culture etc. Due to different background, not like Beidahuang which must take responsible for food storage and food safety required by government policy, ADM has little impact from policy which can focus more on customer and consumption needs, though it still had a lot of safety regulations to abide by. The choice of demand-orientation by Beidahuang indicates its transfer from policy-oriented company to market-oriented company which stresses its sustainable business growth instead of pure profit purpose. Therefore, the whole industry chain of Beidahuang is a kind of brand new business model which is different from that of ADM [4].

### Profit pattern

ADM manages the circulation process of all of its processing parts including upstream and downstream products in order to maximize the types and quantities of commodities in each product chain, to extend the product chain persistently, and to develop the new application of by-products. It buys most of its raw materials on the open market but does control the processing and distribution of a number of value-added products. Whole industry chain can acquire much more added value because it not only reduces operation risk of single unit, but also adjusts operation activity in order to adapt to the transfer of added value in industry chain. ADM fulfills its profit growth steadily and constantly through obtaining more opportunity of added value by expanding its industry chain in the direction of vertical integration. ADM keeps the steady increase of its income by making good use of complement and substitute of a series of products. Take amino acid and bean pulp for instance, the demands of consumers will be increased with the price of bean pulp decreases, on the contrary, customers would like to buy low-price raw materials as substitutes such as amino acid. Therefore, ADM is able to avoid inner operation risk no matter how change the demands will be because of the complement and substitute between products. They control a lot more of the value-added activities, and by

focusing on industrial inputs they are not as concerned with meeting the demands of the final consumer. In addition, the profit from agricultural service business has begun to exceed that of oil plants and corn processing, which became the No. 1 business of the company.

As for Beidahuang, the main profit source is grain and oil processing from the analysis of its operation situation, which occupies 86% of its total profit, and the profit pattern, is simple relatively, the business operation can be affected easily by the price fluctuation of raw materials in international market. If they are to emulate ADM, they would include a lot more value-added activity in their portfolio. With all the land that they own, they also control a lot more productions of their raw materials [5].

### Business combination and development pattern

Comparing with Beidahuang, the biggest characteristics of ADM is its multi-level deep and fine processing in order to achieve no waste production, which not only is cost saving, but also environment protection, raw materials are being provided between each product. Thousands of products are deriving from the horizontal integration in multi-crop business field of ADM, which brings a large amount of cash flow to the company business; it is the foundation for its business expansion. On the other hand, Beidahuang is continuously integrating its existed businesses, but they are still operating independently after integration, therefore, they are short of efficient connection. Although Beidahuang achieved management on agricultural industry chain from upstream to downstream to some extent due to its whole industry chain, the complementary degree is not high either in every business unit or among the businesses between chains, which causes waste of company resources [6].

Both ADM and Beidahuang realized the quick expansion of business through the method of merge in history. In actuality, the development order of ADM is expansion first followed by constriction, while Beidahuang is on the contrary. ADM can separate its business which is increasing slowly so that it may concentrate on core-business again. While Beidahuang is weak in doing so and its purpose is not clear. Of course different external environment gave rise to different process of core-business, but Beidahuang is far fall behind ADM from the viewpoint of specialized level of single business unit. For instance, ADM can produce industrial oil, soybean meal, biodiesel, systematic vegetable proteins, vitamin E, soybean protein, vegetable oil and lecithin by processing oil seeds. In this aspect, the oil seeds processing

of Beidahuang focus on only few fields such as edible oil and lecithin, and it face with difficulties of enhancing the specialized level of individual business unit. Indeed, Beidahuang needs to master getting additional value from its existing processing facilities.

### Alliance

Every business of Beidahuang is a separate entity which pursues its own profit, so it is difficult to coordinate each other. It is a big and complicated project to integrate and operate multi-industry chains. Whole industry chain requires balanced development of all kinds of industry chains, however, at present, it is obvious between strength and weakness, coordination and balanced development in multi-part are not exist either in raw materials of agricultural products or in terminal consumption goods including cultivation, purchasing, trade and logistics, food ingredient and beverage production, breeding meat processing, food processing and marketing. In spite of trying to create entire competitiveness through systematic management of the whole industry chain and effective management of key parts, there is still no efficient coordination between business chains, even it lost entire resources of the group [7].

ADM implements centralized management to every business part globally, and it is striving to achieve much higher operation efficiency and much more profit after coordination among multi-industry chains in cross way. It built core competence in each part of agricultural products industry chain such as obtaining and storage of crop, processing and trade, development and application of biology energy, so ADM is enjoying fully the opportunity and challenge caused by the development of agricultural industry via alliance in cross way. Moreover, the industry chain is being extended constantly by means of vertical coordination of its processing process. ADM keeps the dominated competitive position of cost ahead guaranteed by cutting down logistics cost because the resources among multi-industry chains share each other efficiently. It provides low-cost differential service to customers due to its coordination in sales part which is the end of industry chain, processing part of agricultural products and logistics business. The customers of agricultural products processing at the beginning stage and deep processing are exactly same, which is convenient to search for new consumers because of sharing customer resource.

### Periodical transitions

So far, the development history and strategic transition of Beidahuang may be divided into three periods roughly.

First, Period of business entity strategic transition. During this period, Beidahuang integrated its trade and business entity, which made a breakthrough in the business of edible oil, beverage, vine, malt, flour, chocolate and metal packaging through its traditional advantages in the fields of grain, oil, and food, it also drew lessons from abroad and hold the rules of consumption upgrade. Second, period of systematic strategic integration. Beidahuang achieved multi development strategy by means of merge, but it is not good at separating its core business, so actually the development strategy of diversification and specialization of business have not been realized. Third, period of whole industry chain. Beidahuang put forward the new strategy and target of "whole industry chain of grain, oil and food", and specified the core role of whole industry chain; however, it is weak in the ability of research and development [8].

The strategic transition of ADM experienced periods of agriculture, chemistry and energy service. In comparison with Beidahuang, the transition of ADM is steadier, more thorough and more perfect. It integrated all of its businesses both in vertical and lateral way during agricultural period, and laid foundation for the management afterwards because it separated its core business. Followed by chemistry period, ADM organized world-class R&D team which includes over 250 scientists and engineers, who are doing job all over the world, and their research fields are being emphasized differently. These research centers provide effective technological support for entering into other fields, developing high value-added products and non-waste production. Currently, ADM is improving its profit ability after transferred from traditional food industry to high value-added energy and agricultural service field.

### Strategic layout

Originally, Beidahuang neither established connection with farmers, nor engaged in the obtaining and transportation of crop, it not only lacks of the direct contact with the down-stream customers, but also in short of logistics facilities of food storage which ADM owns. So in terms of its competence, internationalization is a disadvantage to Beidahuang. Crop source management and raw materials supply are always weak. Beidahuang is playing a role of importer or exporter in international market, which lacks of capability, experience, working team and human resources of international operation. Although it is entering crop purchase part and increasing its ability of raw material supply, controlling food supply in some provinces and cities of China, there is a long way to go in order to

become a multinational company with international competitiveness because it does layout only in domestic market. Part of expanding internationally, is opening to innovative ideas and visiting with other countries to see how they want their products produced and processed. For high-income countries, quality is paramount, and traceability is becoming more important [9].

In the meanwhile, ADM has already achieved global layout, it specified the demands of food ingredient and oil products required by terminal consumers by improving the ability of ingredient providing and processing in East Europe. West Europe is primary importer and processing place of ADM. So there is big room for East Europe concerning its processing potentiality. Considering the rise of planting area and output of crop, South America will be the most potential food supplier in the world. ADM pays attention to global balanced layout both in production and sale districts. By means of global layout, it may reduce the influence to operation due to different seasons and climate change.

It is expected that 30 million populations will transfer from rural area to urban area in China in the following 15 years with the trend of urbanization; the living style will be transformed as well. The diet structure of Chinese people will be changed with the growth of GDP and income per capita. At the same time, China needs to improve production capability greatly to meet the increasing daily demands of beverage and food. Naturally, China is one of the key parts of global layout of ADM.

### Risk management

Beidahuang manages its risk by combining Futures with Spot in financial market. It made great progress in hedging business in the past few years and acquired outstanding achievement at the background of big turbulence though the risk control measure is still simple comparing with foreign large-scale enterprises.

ADM reduced its risk by integrating industry chain, transferring profit part, global layout and government public relations except the traditional means of futures. Both the dependence on food ingredient during the process of products processing and the fluctuation with the change of seasons of business have been deduced due to its vertical integration of product chain. Besides, ADM transferred the profit from product processing to trade, controlled the profit flow of industry chain so that it reasonably avoided tax in operation. Specific speaking, despite the profit of soybean oil mill is low apparently, in fact ADM reduced risk by transferring its profit because of the global layout of industry chain. ADM cooperates not

only with domestic government, but also with other countries. The relative high price of product and service are being assumed by customers and taxpayers supported by the government, which is a classical business model of ADM [10].

### Conclusion

Heilongjiang province is a large agricultural province in northeast China. Beidahuang Company as one of agricultural listed companies is the leading agriculture enterprise in Heilongjiang province, which has a great potential in agricultural development. It analyzed the operation achievement of Beidahuang Company and ADM, using the factor analysis model to find out the advantages and disadvantages of the two companies, and giving the corresponding countermeasures.

The main conclusions of this paper are as follows:

First, according to the factor analysis of the operation achievement of Beidahuang Company and ADM, the results show that the growth rate of both companies presented a "decline first and then rise" curve from 2004 to 2017, indicating that they still has development potential [11].

Second, this paper believes that there is still room for improvement in the financial performance of Beidahuang Company and ADM. Beidahuang can make use of financial leverage reasonably and effectively by optimizing capital structure and liability structure to increase the utilization efficiency of assets. Beidahuang company can speed up the agricultural industrial chain integration through improving transport efficiency, expanding the scope of the sales and channel to improve liquidity of inventory, reduce inventory fund, indirectly promote the company's capital use efficiency by increasing the investment in agricultural science and technology, promote the upgrading of industrial structure in order that the company can grow faster [12].

### Recommendation for further works

In the research process of this paper, the data is limited and not easy to obtain, so the paper also has the following shortcomings and deficiencies:

### Indicators selection

In this paper, the factor analysis method and gray relational analysis method are used to calculate the operation achievement. There is objectivity in the method, but it is inevitable to have subjectivity in the index selection. Therefore, there is no rigorous method to



prove the accuracy of the above performance evaluation results.

### Data selection

This paper used the data in the annual report of Beidahuang Company and ADM to conduct factor analysis on the data of the company in the 14 years from 2004 to 2017. Considering the limitation of data acquisition, the data analysis was not carried out in more extensive years, resulting in insufficient persuasiveness and representativeness of the analysis results.

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