

Chinese Policy Influence on Agriculture Technology Companies---A Case Study of Xin Yuan Agriculture Technology Company

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Abstract. Agriculture technology is a new trend in agriculture in China, which means using technology to cultivate new kind of products and improve productivity. This kind of company representative a revolution in agriculture. Therefore, Chinese government put emphasis on this kind of technology companies and put forward many policies to support them. This article researches a typical case and learns the way government support this kind of company.

Keywords: Agriculture technology company, Economic Policy, China.

1. Introduction

From ancient times, agricultural products have been essential for people. It has long been a significant portion of economy. As the importance of agricultural products rises, agriculture technology emerges. The term “Agricultural technology” stands for the equipment, genetic material, farming techniques and agricultural inputs that have been used to make production in agriculture more effectively[1]. In the contemporary world, agricultural technology not only helps in promoting the efficiency, but also letting farmers produce in a more scientific, more convenient, and more sustainable way. The business that associated with farming and agricultural production and their related industries is agricultural enterprise.^[2] And the agricultural technology enterprises are the combination of agricultural technology and agricultural enterprises. Nowadays, the agricultural technology enterprises rise rapidly, showing the world’s concerns about the industry.

China is one of the world’s agricultural origins and has long been an enormous agricultural economy. In China, the government support agricultural technology enterprises in many ways. For instance, the Chinese government has implemented policies to protect the cultivated land. Although China is a country with broad territory, it also has a large population. This means that it always has a large need for cultivated land. As a result, the arable lands must be protected, and people should endeavor to avoid land degradation. Land consolidation is needed as well. Now, the government support the agricultural business to develop techniques to control soil erosion and construct fertile topsoil. In this way, there will be more usable cultivated land for farmers to grow crops. Hence, there will be more needs for agricultural technology and equipment.

Chinese government also show their support to agricultural technology enterprises through other policies like funding the innovation of agricultural technology. The development and innovation of agricultural technologies clearly relies on mass capital investment. However, there are not always sufficient money for agricultural technology enterprises to develop and improve their technologies. Many factors, for example, the epidemic, would influence the profit of the firms. Especially when China has been very serious in confronting Covid-19 during the pandemic. These days, shipping would not be available in those areas where and when an epidemic outbreak occurs. This declines the sales and profits of the companies. Nowadays, Chinese government has set up agricultural funds for the enterprises to develop new equipment and technologies. Moreover, the government calls for a

quicker approval of agricultural loans for the enterprises and small business. This makes the experts develop and innovate the agricultural technology at a faster speed.

So how does the Chinese government support the agricultural technology companies during the pandemic? More specifically, what does the Chinese government do to the companies' supply chain during pandemic to help them survive and even grow? Our study gives out some possible answers by investigating Xin Yuan, an agricultural technology company located in Lanzhou, the capital city of Gansu Province in China. During the epidemic, the company survives and maintains their profits by keeping a good relationship with the government. As a company that target high-end customers, Xin Yuan managed to increase their sale by being primary supplier of food of the government's dining service. In this way, more people working within the government get to know about their products, thus increase sales. Also, the government publish a policy called Notice on policy-oriented finance supporting the integrated development of rural primary, secondary and tertiary industries during the Covid-19, which financially support the agricultural science and technology industries. Under the direction of the policy, banks provide a lower interest rate for those companies and prolong the period of repaying debt. This levitates the encumbrance of the companies. Moreover, the government encourages Xin Yuan to buy feed from nearby farmers. It is also encouraged that Xin Yuan should build refrigerators to keep their products fresh. In this way, the problems of transportation are solved.

Our paper is carried out in four sections, including introduction, literature review, case studies and conclusions. The next section will review previous works related to our paper. It will show how the literature works is contributing to our study. Then we will introduce our case study. We will explain the policies that helps Xin Yuan company in surviving in the pandemic. Section 4 will summary our study and draw our paper to a conclusion.

2. Literature review

The process of urbanization brings about great challenges in agriculture in China. Agriculture is doomed to decay due to the expansion of cities and towns, and the population mobility from the rural area to the urban area, which increases the risk of lacking labor and cultivated land for farming. China now has already lost the benefit of producing land-intensive agriculture products [2]. Besides, the pattern of small-scale agriculture production will persist in China for the foreseeable future, which means it is very difficult to mechanize planting work and extremely easy to waste land when the major labor of a home chooses another industry for more money. At the same time, the developed countries lay out a strategy in technology agriculture and aim to take control of this field. Under such circumstances, the Chinese government starts to focus on breeding high-quality agronomic, agricultural mechanization, and green agriculture [3].

In recent years, the number of government documentaries on tech-agriculture and its innovation is stably increasing [4]. But the raise is not direct but with some fluctuations [5]. The increase in tech-technology policies demonstrates directly that the government is reconsidering the importance of innovation in agriculture and starts to invest more in the field. One of the results of such change is the significant surge in quantities of patents.

Most of the policies on agricultural technology in China are published to help remote areas shake off poverty and help rural areas improve their development. The technology here sometimes can be understood as another try to develop agriculture in this area with barren lands or rugged mountainous lands. There are few actual innovative products or techniques created in the process of technology innovation [6].

There are two types of financial support that the government provides for private companies: giving financial assistance before the program starts or providing subsidies after the program [7]. The previous support accounts for a large scale of financial support. The reason why later support is less popular is that it's too risky for enterprises to start a program without any assurance. The R&D in agriculture is very likely to end up failing since the condition of crops or fruit or animal depends on many random elements. Besides, the target of the financial report is to help research companies while

most private agriculture enterprises are trying to gain profit. It is likely that the result of the program isn't up to the standard of financial support. This phenomenon illustrates that many financial policies did not make a difference and failed to encourage tech-agricultural companies to explore more.

The government plays a vital role in the development of tech agriculture. In Japan, R&D in agriculture is the public welfare, but still, it is difficult for the government to develop it by setting up specialized apartments due to the attribute of the Japanese market. Thus, the government creates an independent legal entity allowing more flexibility in R&D institutions [8]. The history of the US investment in tech agriculture is also instructive. The US focused on high-tech agriculture education before World War II, promoting new techniques among farmers. During the economic recession, the government cut the budget on investment, but the government started to encourage the commercialization of patents from then on. Now the investment from private companies is more than that from the government [9]. Different from the situation in the US, the Chinese government invests in agriculture mainly to help the companies survive. Those tech agriculture companies face many problems when transforming techniques into practice as well.

Although numerous models are focusing on the relationship between the sustainable and environmental dimension of supply chain and government policy, the pure influence that government policy on supply chain brings to SMEs hasn't been value too much. Our research uses a case study as a tool to show the influence that government policies on the supply chain bring to intelligent agriculture companies.

3. Case study

Our research subject is a farming technology company called Xin Yuan farming technology company in Lanzhou, the capital city of Gansu province in China. This company was constructed in 2014 with a registered capital 10 million. The company has more than 120 employees. It produces high-quality fruits like cherries and grapes. Besides, the company operates the breeding sheep and meet sheep with high quality. It performs well under the epidemic period, which can be account for Chinese government giving it many helpful policies. In the future, Xin Yuan company wants to construct its farming land as an amusement place for adults and their children, combining first industry、 second industry and third industry. In order to realize the strategic planning, there are some difficulties which it need tend to government for help.

3.1 how to keep company profits

Firstly, Xin Yuan is facing problems of keeping profits Science and technology agriculture is characterized by high input, low output, high instability and long return period. Besides, Since it is in its primary stages, it needs much money for fundamental infrastructure construction. Moreover, because the company produce high quality farming products, its cost is always high. Take sheep and fruits as examples, there are many technologies with scientific research. The sheep are bred by introducing high-quality breeding sheep from Australia and crossbreeding with high-yield sheep from China. In this progress, the research、 hiring experts and transportation fee are considerable. Therefore, Although the sheep have good taste and are green and healthy, the price of sheep is really high.in Chinese market, the common price of a sheep is about 40-50 yuan per catty, but Xin Yuan company's sheep is 80 yuan per catty. For fruits, the company uses the automatic pipe irrigation system and grafting technology, providing their grapes with good taste. The price increases as the equipment improves. Their grape named "Sunny Rose" worth 100 yuan per strand, which exceed much than market average price about 10-20 yuan. Under such price, their products do not have competence selling online. So their target customers group is really small, when people are restricted to travel, and many offline stores are forced to close. Therefore, the company need government's help. In this case, government can give this kind of companies a chance to compete to become monopoly or non-monopoly supplier of local government for the public relationship gift or welfare for government staff. This action gives these companies a stable platform to sell their farming products.

Besides, Xin Yuan company has developed great relationship with the government, so they established a special high-end customer group through government. These customers have high demand of their life, so this group is small but stable.

3.2 how to get enough money for the early investment and infrastructure construction

Secondly, Xin Yuan company is facing the problem of getting enough money for the early investment and infrastructure construction. Science and technology agriculture companies often need at least 2-3 years of recovery cycle before they have ability to repay part of the bank loans. In addition, science and technology agriculture needs good infrastructure, such as greenhouse irrigation system, automatic sheep pen, etc. it also needs to rely on the strength of scientific research institutions and professionals to carry out high-quality breeding and reproduction, which costs a lot. However, science and technology agriculture are still at the initial stage of exploration and lack of experience. It is easy to cause high-end crops to die collectively when they do not adapt to the local natural conditions, thus causing irreparable losses. According to the Xin Yuan company, there has been a loss of all deaths due to acclimatization of cherries. Therefore, for the lenders, it is reasonable to refuse to provide loans because they belong to the category of loans with higher risks. As a result, most enterprises do not have the funds to set up scientific and technological agricultural companies, which makes a small number of scientific and technological agricultural companies have further reduced their experience in operation and production, and the operational risk remains high. Under this circumstances, Chinese government publish a policy called < Notice on policy-oriented finance supporting the integrated development of rural primary, secondary and tertiary industries >, it demands that Policy oriented finance supports the integrated development of rural industries, increases the preferential degree of policy oriented finance, promotes policy oriented finance to support the development of a number of excellent agricultural science and technology industries. Therefore, banks need follow the policy regulation and set lower interest rate for these companies. Besides, banks are required to prolong the time period of repay the debt to lessen the burden of the farming technology company. For Xin Yuan company, they plan to develop the farming company to a comprehensive amusement farming company. So the political finance support will be really important. The manager of the company said to me:

At present, we mainly want to do three parts in this platform: the first part is to further improve the quality of our improved sheep and strengthen the scientific research on research and development and cultivation of improved sheep; In the second part, based on our agricultural park, we will develop the tertiary industry, establish a tree house paradise, a planting paradise, an agricultural experience Park, a health center, and so on, so that adults can bring their children to visit the mountains and waters and experience the agricultural culture. But this is expensive, we need about 4 billion yuan more. Our final goal is to increase the added value of our agricultural products and sell our agricultural products at a good price. As far as agriculture is concerned, if it is not integrated with the three industries, it may have reached the end. Therefore, this ecological park is actually a business form combining primary, secondary and tertiary industries with agriculture as the theme.

Following is the annual report for Xin Yuan company, which can reflect the capital currency of the company:

Table.1. the finance support of Xin Yuan company

	September 2021	The exchange degree compared with 2020	Exchange reason	September 2020	The exchange degree compared with 2019	Exchange reason
Current capital	95.22	-90.32%	Management need	983. 51	209.55%	Management need
Other receivables	8986.62	76.52%	Xin Yuan company contributed 34,526,600 yuan	5090.96	102.91%	Xin Yuan company

						contributed 21,186,400 yuan
Total capital	37360.16	6.3%	The largest changes were in monetary funds and other receivables.	35147.36	12.06%	The largest changes were in monetary funds and other receivables.
Short time debt	3300	440.98%	On November 16, the credit investigation showed that there were 32 million yuan of short-term loans from Bank of Lanzhou and 1 million yuan of short-term loans from Bank of China	610	0.00%	Come from Bank of communications, Bank of China, Bank of Lanzhou, and Bank of Lanzhou. They have all been settled
Long-term debt	1500	-16.67%	In 2019, the details of this subject were: Lanzhou Honggu District Urban Investment Company was 18 million yuan. Lanzhou Honggu District Urban Investment Company applied to CDB for a loan in its own name. The principal was 3 million yuan every two years, and the loan was due in 2030	1500	0.00%	Not change
debt	14345.28	10.33%	In September 2021, the current liabilities increased by 36.4296 million yuan, of which short-term loans and accounts payable had the largest change. Non current liabilities decreased by 23 million yuan, mainly due to the decrease of 23 million yuan in long-term borrowings compared with the beginning of the year	13002.32	15.6%	The current liabilities in 2020 increased by 18.0232 million yuan, of which accounts payable had the largest change. Non current liabilities increased by 14.8 million yuan.
Net profit	1973.64	-2.65%	Not change	2027.45	-9.01%	Not change

3.3 how to connect the supplier line under the epidemic traveling restriction

Thirdly, Xin Yuan company faces the problem of connecting the supplier line under the epidemic traveling restriction. Under the pressure of COVID-19, the farms have been greatly impacted. Affected by the gridding prevention and control of many villages and roads, the transportation of feed and veterinary drugs has been blocked, and some farm households have the problem of insufficient stock of feed. There are also difficulties in transporting meat products out of the farm and entering the pasture. Animal protection products, vaccines and production urgently needed supplies cannot be delivered on time, meat and egg products cannot be transported out, and breeding livestock and poultry vaccines cannot be transported in. At present, the mutual squeezing on the breeding chain is missing the new breeding cycle, which seriously affects the sustainability of the production of the breeding industry. According to the questionnaire and telephone survey of the farms of the Institute of agricultural economics of the Chinese Academy of Agricultural Sciences, 77.8% of the farmers have reduced the amount of livestock and poultry, and 31.9% of the farmers have reduced the amount of livestock and poultry. In Xin Yuan company, due to the closed control and silent management of the epidemic in Lanzhou from July to August 2022, it was difficult for the company to import sheep feed from nearby areas, and the source of sheep feed became single (only the green corn planted by the villagers near the company), and the quality of sheep also decreased. At the same time, because the company adopted the method of circular agriculture and used sheep dung as fertilizer to nourish fruit products, The disruption of sheep feed supply caused the decline of orchard quality. At the same time, due to epidemic management and express sealing control, many products cannot be delivered to customers. Customers either cancel their orders or have no time to cancel them. They can only wait for the fruits to rot in the Express Center. Agricultural science and technology companies that cannot connect the upstream and downstream supply chains can only bear high science and technology costs, land costs and labor costs, but they cannot obtain corresponding benefits. Therefore, government encourages Xin Yuan to buy feed nearby from farmers. This action can not only reduce the transportation benefit, but can also get enough feed during epidemic period. Besides, government encourages Xin Yuan to build refrigerator to keep the feed fresh and enough to support through the transportation regulation time.

All in all, Xin Yuan can perform well during epidemic time, the government's support played an important role. In China, the political factors can impact economic development a lot, companies should follow the political trend to gain over-average welfare.

4. Summary

In this typical agriculture technology case, government uses its power to keep company benefit, keep the fund currency, keep the supplier line. And in China, this government intervene is a common thing. In this part, more examples will be used to support the government action to support Chinese agriculture technology companies.

4.1 Government policies about the company benefit

In the hi-tech agriculture field, companies are divided into three types. One of these companies is non-listed companies, which master advanced technology and have extensive experience in agriculture. Another type is those companies who go to public, which focus on certain field, but fail to extend in a short time. The last type of company is the business unit of enterprise on a large scale, easily getting financial support from the parent company and having a strong will to innovate.

The profit model of a listed company can be analyzed by financial statement analysis. In China, the major heavy buyers of hi-tech agriculture companies are government-owned corporations, which means the development of hi-tech agriculture terribly relies on the government.

With the development of information, the business income of the big data platform is particularly dazzling, in the hi-tech agriculture field, the big data platform mainly refers to the use of developed ecological intelligent hardware products to interconnect things with things, and the collected

ecological data for scientific calculus and algorithm calculation, and finally through the establishment of intelligent ecological Internet of Things and big data platform model, and then applied to the actual scene of customers. Many tech farming companies are offering big data services as a new major growth point. At present, the data platform has been established and used in cities, which can provide data support for agriculture, water conservancy and meteorology.

4.2 Government policies about the fund currency

Although China's investment in agricultural science and technology has been increasing in recent years, the intensity of investment in agricultural science and technology has always been stable at about 0.23%, which is obviously lower than the standard of 2%. This shows that China has not really entered the stage of independent innovation in agricultural science and technology, and it needs to further strengthen financial support for agricultural science and technology innovation.

In 2021, People Bank of China together with Ministry of rural agriculture has put forward a policy instruction, which says that the financial supporting parts like bank need to create special products for farmers and make the first, second and third industries have a comprehensive development. Besides, the government will set a list which concludes the qualified agriculture companies. Banks must provide point to point financial service to these kinds of companies. The purpose of doing that is decreasing the bank financial risks and increasing the money efficiency for those good companies. And government has an requirement that banks should not only supply money for them, but also teach them how to plan their money. They need to set an information ask place for farmers. Government also puts forward that agriculture companies can be on the market to collect money.

For bank system, they need to have clear division of responsibilities [10]. For large and medium-sized state-owned banks, they need to build agriculture supporting system and new department like Rural Inclusive Finance Department and Support departments for rural small, medium and micro enterprises, etc. For some small-scale banks, they need to provide small, swift and convenient currency support for agricultural companies. Banking financial institutions should actively promote the mortgage loan of the management right of rural contracted land, support the legally compliant mortgage and pledge financing of agricultural machinery and greenhouse facilities, live livestock and poultry, breeding pens, agricultural trademarks, insurance policies, etc., and explore the mortgage loan business of the use right of collective operating construction land, rural collective operating assets shares, and the use right of state-owned agricultural land for agricultural reclamation in areas with conditions. For incentives, government improves the level of the tolerance of bad debt in bank, below 3% will not be deducted points, which gives some space for banks to provide money for some little agriculture companies. Except for money providing, banks should also do good job at insurance and risk control of the agriculture companies. Government will actively promote the pilot of full cost insurance and income insurance for rice, wheat and corn, and gradually expand the practice of replacing subsidies with awards for agricultural products insurance with local advantages and characteristics to the whole country.

China now is under great pressure about international agriculture products competence. Therefore, Chinese government supports the agriculture technology development. And it is a money-costing process when the technology is being researched. Under such circumstances, rationally allocating existing funds and project resources, and support qualified enterprises to independently establish high-level R & D institutions is the way to reduce the financial pressure. Tax department should give tax reduce on these companies.

All in all, the government has put forward many policies to support the agriculture technology companies to get stable and enough fund currency.

4.3 Government policies about connect the supplier line

China has long been paying attention on food safety. Proteins, when makes a vital portion of our daily intake, comes from livestock [11]. Stock farming is a significant part of agriculture. And the development and improvement of facility of the animal husbandry is also strongly supported by the

government. This is where the agricultural technology is put to good use. With the new techniques and equipment, the output of the animals is increased. It will improve the quality and the security of the proteins as well. Cold chain, as an important part of the transportation of food, its improvement of technology is also supported. A unique feature of agricultural products is timeliness. Vegetables and fruits are quickly withered, and meat and dairies will soon be spoiled. As the pandemic makes deliveries harder and even restricted, a considerable number of agricultural products will be wasted. The government put up a policy of Notice on Promoting Policy-based Development Finance to Support Agricultural and Rural Infrastructure Construction to encourage the development of cold chain. In this policy, the government support the construction of cold chain facilities to preserve the freshness of food. Thus, the demand for the improvement of agricultural technology also increases.

5. Conclusions

China has comprehensive and effective policies to support agriculture technologies companies. Under the circumstances of covid-19, many companies have lived because of the support of government. This article uses an exact example of this kind of company in China to do a survey and interview. Actually, there are more examples that we do not include in our article. In the future, the subjects of the China policy influence on agricultural economics will be explored more deeply and further.

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