Study on the Influence of Risk Factors in China's Photovoltaic Industry

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Abstract. The adjustment and transformation of energy structure is encountered as a common problem of the world. With the deepening globalization, Photovoltaic energy as the clean and renewable energy occupies an important position in the future energy structure. The short-term explosive growth promotes the rapid growth of China’s photovoltaic industry as one of the largest photovoltaic producer and application market in the world. Due to the short development life and insufficient industry precipitation, the unstable industrial foundation is vulnerable to industrial risk impact. Therefore, to predict the internal and external risks of the industry in advance can effectively prevent or mitigate the impact of risks. By collating and summarizing the disclosure information of significant events and risk factors in the prospectus of Chinese photovoltaic listed companies, this paper identifies and analyzes the main factors faced in the development of photovoltaic industry, and put forward relevant suggestions for risk prevention and control of photovoltaic industry.

Keywords: photovoltaic industry, industrial risk factors, coping strategies

1. Introduction

At present, a new round of energy revolution is booming. The photovoltaic power generation projects that can adjust the energy structure and solve the energy accessibility have been rapidly promoted and applied over the world. Since the reform and opening up, China's photovoltaic industry has achieved a rapid development situation from scratch, becoming one of the few emerging industries with global market influence in China. Due to the temptation of policy dividend, market potential and high profit, a large number of non-professional enterprises that engaged in module research and development and photovoltaic business blindly follow the trend of investment in the short term, resulting in the explosive growth of photovoltaic industry in the short term. It is precisely because of the lack of precipitation and accumulation in the development process of photovoltaic industry, unstable development foundation and weak anti risk ability that the risk probability of suffering from industrial shock and industrial shock is increasing. How to identify and deal with the risks of photovoltaic industry is very worthy of our in-depth study, and make industry risk prediction in advance, so as to lay a solid foundation for better development of photovoltaic industry in the future.
2. Development status of photovoltaic industry in China
Since 2004, China's photovoltaic industry has achieved rapid development. With the leading research and development technology and cost advantages, the capacity has been expanding, and the share in the international market has been rapidly increased. In 2018, the European Union officially ended its five-year anti-dumping and countervailing measures for China's photovoltaic industry. On 31st May of the same year, the Chinese government began to reduce its policy support for the photovoltaic industry. In 2019, the domestic and foreign photovoltaic markets are back to a stable growth situation. According to the statistics of the International Energy Agency, the global installed capacity is 114.9gw in 2019, an increase of about 12% year-on-year. Both the traditional photovoltaic market and the emerging market, the global installed capacity shows a growing trend. In 2019, Chinese manufacturers have promoted the rapid expansion of production capacity by virtue of their significant cost advantages. The proportion of production in polysilicon, silicon wafer, battery chip, component and inverter has increased to 67%, 97%, 79%, 71% and 59% respectively. In general, China's photovoltaic industry chain is relatively complete, with strong international market competitiveness. However, due to the mismatching of supply and demand structure and other factors, the domestic market consumption of photovoltaic is limited, and the overseas market development is insufficient. In the face of the changeable domestic and foreign market policy environment, it is very vulnerable to the impact of various uncertain industrial risk factors, and the industry's anti risk ability still needs to be improved.

3. Analysis on the influence of risk factors in China's photovoltaic industry
This paper we use and improve Zhan (2016) the risk information disclosure analysis method of prospectus. Finally, selecting 67 companies as samples from the listed companies which main business is engaged in photovoltaic related industries. According to analyze their prospectus and annual report, we can identify the frequency of occurrence and the level of detail of risk introduction on the photovoltaic industry and integrate the internal and external risk factors of photovoltaic industry.

3.1. External risk
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  - Risk of foreign policy change. Trade frictions and trade protectionism cause crisis. At present, the global economic situation is in a downward trend. Some countries have carried out strict control and suppression on China's export photovoltaic products through frequent launching of "Anti dumping and Countervailing" investigations, elimination of tariff exemptions, setting up trade barriers, etc., in order to protect the development of domestic photovoltaic industry, resulting in continuous international trade disputes. Under the dual influence of product price decline and trade barriers, Chinese photovoltaic enterprises have suffered heavy losses, some enterprises have gone bankrupt due to insolvency; some enterprises will cause a new round of anti-dumping trade sanctions due to disorderly competition. As a result, Chinese enterprises are likely to face the risk shock which is brought by trade friction and protectionism when they explore overseas markets. The cancellation of foreign government subsidies is likely to cause crisis. Taking a look at the current global market, benefiting from the improvement of industrial technology and the decrease of cost, the traditional photovoltaic market countries are experiencing the development stage from reducing subsidies to breaking away from subsidies. As the photovoltaic industry belongs to the policy based cyclical industry under the path of policy dependence, China's photovoltaic industry has not yet been fully able to get rid of subsidies due to its short
development period. Once encountering the reduction of subsidies in the international market and the reduction of installation plans, China's photovoltaic exports are likely to fall into an industrial crisis.

- Domestic policy risk and market risk. In terms of policy risks, after the year of 2014-2017's rapid progress, the new policy measures of 2018's support reduction have made China's domestic photovoltaic market demand rapidly decline, product prices rapidly decline, enterprise capacity utilization rate and profit margin significantly reduce, the household photovoltaic market stagnates, and the industry's development enthusiasm plummets. A series of industry development problems are caused by the policy decline, which to a certain extent prevents the blind entry of photovoltaic enterprises and accelerates the exit of some small and medium-sized enterprises. In terms of market risk, at present, foreign countries have carried out the non subsidy photovoltaic power generation plan, which requires more strict cost reduction of photovoltaic enterprises and more fierce market competition. Spain, Portugal, Italy and other countries have been in the forefront of non subsidized utility scale photovoltaic power generation. As the cost continues to decline, the trend of non subsidized photovoltaic power generation will spread to areas outside southern Europe. The development of foreign non subsidy projects puts forward higher requirements for Chinese photovoltaic enterprises to explore overseas markets, in order to cope with the risk of power plant profitability reduction and market elimination.

3.2. Internal risk
Due to the rapid development of photovoltaic enterprises under the policy subsidies and relatively loose financing environment, the internal risk management and control ability of enterprises is weak, and the technological innovation ability is still insufficient. After entering the era of affordable Internet access, photovoltaic enterprises will face greater internal risk challenges.

- Technology substitution risk. Photovoltaic industry is a typical technology dependent industry. In the certain extent, the technology research and development and innovation are determined the market competitiveness of the Photovoltaic industry. The technology of photovoltaic industry is updated rapidly, especially the polysilicon and solar cells are technology and capital intensive industries. The enterprise's operating efficiency is highly sensitive to technology, and it will face a high risk of technology substitution if it does not form an effective technology core competitiveness. It is not only necessary to develop and innovate the components, improve the purification rate and reduce the cost, but also to fully integrate the Internet technology to strengthen the development of applications, propose intelligent software solutions, and provide more perfect services for photovoltaic users in the family energy storage, roof installation and cloud software solutions.

- Financial risk
  - First is cash flow risk. The development of photovoltaic industry has a strong policy dependence. Under the influence of multiple factors such as tighter asset management, arrears of subsidies, and the promulgation of the new policy of "recession", the issue of corporate cash flow has become the focus of industry risk. On the one hand, the data shows that in 2018, China's renewable energy subsidy gap exceeded 140 billion yuan, of which photovoltaic industry gap exceeded 60 billion yuan. For photovoltaic enterprises that rely on renewable energy subsidies and have large investment in operation, failure to pay subsidies in time will cause a huge risk crisis to the cash flow of enterprises. On the other hand, in addition to state subsidies, the price of FGD benchmark coal can not be settled on time, some power grid enterprises use acceptance bills too much in the electricity fee settlement, the bank's credit fund is insufficient, and the borrowing cost increases, which are very easy to make enterprises suffer from the risk of capital chain fracture.
  - Secondly is financing risk. On the one hand, the frequent changes of domestic and foreign market policies lead to the credit reduction of photovoltaic projects caused by the lack of investment confidence of financial institutions, and more stringent credit additional terms are added to prevent financial risks. On the other hand, due to the serious overcapacity of photovoltaic equipment, the low development of photovoltaic industry affected by policies and other factors, the stock price of listed
companies fluctuates. Photovoltaic companies are seriously inadequate in the capital market financing capacity, and they are always facing the dilemma of financing risks.

Finally, it is in terms of non-technical cost risk. According to the survey of China Photovoltaic Industry Association, under the same project yield, the electricity price of foreign excellent projects is 40% or even 60% lower than that of China. In addition to the difference of sunshine resources, the cost difference mainly comes from the difference of capital cost, connection and grid connection, tax subsidy and land cost. At present, the non-technical cost accounts for 20% or more of the total project investment cost in China's photovoltaic power plant project investment, mainly including the intermediary fee, land fee, tax, grid access fee, subsidy arrears, financing fee, etc., which leads to the increasing proportion of non-technical cost.

4. Suggestion remarks
In this paper, we realize the global photovoltaic industry is still a policy-oriented industry in the current trend. The development of the industry has not yet entered a fully market-oriented development state, and the development of the industrial pattern has not been stable. We focus on four findings which should be found to cope with the impact of uncertain risk factor as follow.

4.1. Actively exploring overseas emerging markets and reasonably avoid trade risks
China's PV enterprises one belt, one road, and other countries along Philippines, Thailand, Vietnam and India will continue to maintain market development and cooperation. Through joint and merger, China's PV enterprises need to achieve economies of scale and upgrade their industrial technology level, avoid homogenization competition and reduce the risk of vicious competition.

4.2. Strengthening the internal control of enterprises and avoid financial risks reasonably
Photovoltaic enterprises should control debt capital within a reasonable range in daily life, and should not borrow due to blind expansion to avoid financial risks. For financing difficulties, photovoltaic enterprises can use their own intellectual property achievements to raise funds through intellectual property securitization, which can reduce the generation of financing risks to a certain extent.

4.3. Strengthening technological research and development innovation to avoid technological risks
China's photovoltaic enterprises should step out of the "comfort zone" that relies on government subsidies for profits, increase innovation research and development and investment, make full use of new energy, new materials, new technologies, new applications and other platform systems to enhance their core competitiveness and enhance their ability to resist technological risks.

4.4. Formulating reasonable industrial development policies is to avoid industrial crisis
The photovoltaic industry should be taken a certain time to really elimination of subsidies. The government should actively guide the enterprises to increase investment in innovation and research and development, strengthen technological research and development with scientific research institutions, guide photovoltaic enterprises to merge and restructure within the industry, and improve economies of scale. Externally, the government should optimize the business environment, reduce administrative barriers, and give preferential treatment to relevant enterprises. All in all, making risk prediction in advance, strengthening risk awareness, and improving strategic response capacity, which is achieved the development goal of a strong photovoltaic industry.

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