

Research on Logistics Finance and Supply Chain Finance Countermeasures of Guangxi Aluminum Industry

Chen Zhuojun

School of Economics, Guangxi University, Nanning, Guangxi, 530004, China

Keywords: Guangxi, aluminum industry, logistics finance, supply chain finance

Abstract: This paper first expounds the characteristics of the aluminum industry and the prospect of the development of the aluminum industry in Guangxi. According to the characteristics of the products, it sorts out the types of pledged goods in each link of the aluminum industry, and analyses the advantages and disadvantages of Guangxi aluminum industry logistics finance and supply chain finance based on the current situation. Then it analyses the intervention points and difficulties of Guangxi aluminum industry logistics finance and supply chain finance business, with specific types of business examples to explain, and analyses the risk points and control measures involved. Finally, it puts forward strategic suggestions for the development of logistics finance and supply chain finance in Guangxi aluminum industry.

1. Introduction

Logistics finance has a long history. Tina Breckwoldt has proved that in the Mesopotamian plain in 2000 BC, grain is the most important product and currency of society, and its storage facilities and grading system are very common^[1]. Until modern times, agricultural warehouse receipt financing still plays an important role. Daniele Giovannucci, Panos Varangis et al. pointed out that warehouse receipts play an important role in increasing farmers' liquidity and broadening financing channels. It can also smooth market supply prices, increase farmers' income and reduce food losses. And designed a warehouse receipt system that can promote credit and commodity markets^[2]. The exploration of asset-based financing business is the prelude to the emergence of logistics finance. Poe introduced the asset-based financing business, which is an important implementation mode of logistics finance, and pointed out that the collateral of asset-based financing business is mainly inventory and accounts receivable, so wholesalers, distributors and retailers are all suitable for logistics finance financing^[3]. Ronald J. Mann pointed out that we do not know how borrowers and lenders decide whether to engage in secured or unsecured transactions, and the existing secured loan theory is not sufficient. Through interviews and empirical research, a decision model for borrowers to grant collateral was developed, focusing on borrowers' perception of the costs and benefits of secured and unsecured transactions. The collateral reduces the total cost of the loan transaction by reducing the pre-loan perception of default risk^[4]. Erik Hofmann pointed out that the

current supply chain management starts from the financial and capital decisions of value-creating investment to the end of customer payment. Cross-management of finance and logistics (supply chain) opens up new business areas for banks, financial and logistics service providers^[5]. Logistics finance and supply chain finance are closely related and play an important role in the financing of Guangxi aluminum industry.

2. Characteristics of aluminum industry and development prospect of Guangxi aluminum industry

Aluminum is a metal whose output is second only to steel. Its utilization ways are as follows: mining bauxite (the main component is alumina), obtaining alumina through a series of processes, obtaining liquid aluminum by electrolysis or obtaining aluminum ingot (electrolytic aluminum) after cooling, and finally obtaining application through alloy smelting and machining (casting, extrusion, etc.). The development of the aluminum industry first relies on bauxite resources, consumes a lot of electricity in the electrolysis stage, and is likely to cause serious environmental pollution when low-end processes or no environmental protection measures. Due to the uneven global distribution of production in all aspects of the aluminum industry, its international trade is very active. In the previous period, Shanghai Aluminum and London Metal Exchange LME Aluminum were important non-ferrous metal trading varieties. In summary, the aluminum industry is a resource-oriented, high energy consumption, high pollution, globalization and financial industry.

Aluminum industry is one of the traditional seven pillar industries in Guangxi and one of the main business cards of Guangxi industry. With the construction of new land and sea channels in the west, Guangxi's location advantages and trade advantages have become increasingly apparent. Guangxi has the conditions to facilitate the use of overseas bauxite and other resources, and there are more and more opportunities to undertake the downstream industries of the Pearl River Delta. At present, the aluminum industry in Guangxi is widely distributed, among which the characteristic industrial clusters are: Nanning high-end aluminum industry base, Baise aluminum industry demonstration area, Fangchenggang ecological aluminum industry base, Liuzhou, Laibin and Hezhou aluminum industry agglomeration area. Guangxi develops industrial clusters in these key areas, improves its industrial chain and industrial quality, and then enhances the market competitiveness of Guangxi aluminum industry.

The Guangxi government attaches great importance to the high-quality development of the aluminum industry. In the guiding role of the 'Medium and Long-term Plan for the Second Entrepreneurship of Guangxi Aluminum Industry', the Guangxi government has established an ecological and high-tech development path: First, based on the advantages of Guangxi's aluminum resources, port and overseas resources and industrial base, the integrated development of coal, electricity and aluminum is taken as a breakthrough, and the construction of ecological aluminum industry demonstration base is taken as a carrier to improve the ecological aluminum industry chain. The second is to steadily develop bauxite and alumina, moderately develop electrolytic aluminum, and vigorously develop aluminum alloy and aluminum deep processing. By adjusting and optimizing the industrial layout, enhancing technological innovation capabilities, improving resources and clean energy security capabilities, the coordinated development of the entire industrial chain is achieved. It is estimated that by 2025, the total output value of Guangxi aluminum industry will reach 200 billion yuan, and the industrial added value will reach 72 billion yuan. Among them, the annual output of alumina is 12 million tons, the annual output of electrolytic aluminum is 4.8 million tons, the annual output of recycled aluminum is 1 million tons, and the annual output of aluminum processing products is 5 million tons. Aluminum processing products cover transportation, aerospace, electronic appliances, construction, power, packaging and

other fields, of which deep processing products account for more than half. In terms of financial support, the government actively promotes the establishment of Guangxi ecological aluminum industry investment fund to drive social capital investment. Encourage banks to increase credit support for key projects, encourage key production enterprises to go public for financing, and issue corporate bonds, short-term financing bonds and medium-term notes.

3. Types of pledged goods in each link of aluminum industry

The upstream of the aluminum industry is the bauxite enterprise that produces alumina, and its main pledge is alumina. The purpose of alumina is to produce electrolytic aluminum by electrolytic aluminum enterprises, so its price changes in the same direction as the demand for raw materials by electrolytic aluminum enterprises. For example, when electrolytic aluminum enterprises are limited by electricity and production, alumina enterprises may have inventory backlog, resulting in a decline in the price of alumina market. Alumina is an important bulk raw material with no futures trading varieties.

The middle reaches of the aluminum industry are electrolytic aluminum enterprises, whose pledges include alumina as raw materials and electrolytic aluminum (aluminum ingots) as products. Electrolytic aluminum is a futures trading product, and its price will be locked by hedging to avoid price risk. At the same time, in the futures exchange designated delivery warehouse, electrolytic aluminum inventory can obtain higher regulatory protection.

The downstream of the aluminum industry is aluminum processing enterprises, whose pledges include electrolytic aluminum and various aluminum products as raw materials. Compared with electrolytic aluminum, the general aluminum or other aluminum processing products have lower overall pledgeability and are generally not accepted by banks and other financial institutions as pledges. Specifically, it is necessary to judge according to the liquidity of the types of goods. Those with clear prices and strong demand have high pledgeability due to the convenience of realization, while those with vague prices and weak demand have low pledgeability due to the difficulty of realization.

Aluminum industry is an important entity industry. Products are widely used in power, aerospace, shipbuilding, automobile manufacturing, packaging, construction, transportation and so on. Overall, the prices of alumina, electrolytic aluminum and aluminum processing products fluctuate periodically with macroeconomic conditions.

4. Analysis of the advantages and disadvantages of Guangxi aluminum industry logistics finance and supply chain finance

Guangxi aluminum industry logistics finance and supply chain financial market has the following advantages: First of all, Guangxi has a unique geographical advantage of both the border and the coast. With the construction of a new land and sea channel in the west, Guangxi's import and export of goods from the Beibu Gulf port will be more convenient and cheap, which will expand Guangxi's import of alumina raw materials from abroad. Secondly, the industrial chain of Guangxi aluminum industry is complete, the number of backbone enterprises is large, and the relevant supply chain is mature, which is conducive to banks and other financial institutions to obtain supply chain financial customers. Finally, the Guangxi government promotes the high-quality development of the aluminum industry and promotes the expansion of advanced capacity financing, indicating that the relevant enterprises will generate more inventory financing needs, and the scale of logistics finance and supply chain finance will be further expanded.

Guangxi aluminum industry logistics finance and supply chain financial market has the following disadvantages: First of all, logistics finance and supply chain finance are comprehensive

business, risk control is difficult, business costs are high, and the management ability of financial institutions such as banks is put forward higher requirements. Secondly, logistics finance involves cooperation with third-party logistics supervision enterprises, and some also need to cooperate with logistics financial platforms. Information security sharing between customer enterprises, banks, logistics enterprises and financial platforms is difficult. Finally, most of the upstream and midstream enterprises in the aluminum industry have relatively low production profit margins, and they need low-cost financing, which is contradictory to the immature application of logistics finance in Guangxi.

5. Guangxi aluminum industry logistics financial model

On the intervention point of logistics finance in Guangxi aluminum industry, banks and other financial institutions can actively carry out warehouse receipt or waybill mortgage financing, maritime or railway bill of lading pledge financing, multimodal bill of lading pledge financing, logistics park credit. In the direction of domestic logistics, one is the direction of alumina transportation from Guangxi to Yunnan, Guizhou, Hunan and Northwest China, and the other is the direction of aluminum ingot procurement and transportation from Yunnan and Guizhou. In the direction of international logistics, Guangxi's imports of electrolytic aluminum from Australia, Vietnam, Indonesia and other countries are increasing. We can rely on Guangxi coastal storage resources to carry out dynamic and static inventory pledge, confirmation warehouse, sea and land warehouse business with bauxite and aluminum ingots. Or to carry out the comprehensive logistics financial business of bulk commodity international trade with the pledge of multimodal transport 'one-order' bill of lading. For the selected aluminum products with strong liquidity and stable value, consumer credit logistics finance business can be carried out, with real trade background and logistics supervision as a means of credit enhancement. The difficulties of this part are mainly to make up for the value change of the pledge target, provide efficient and low-cost process management, and necessary exit mechanism. When conditions permit, the trade process and the exit process can apply futures hedging to avoid price risk.

Taking dynamic inventory pledge as an example, according to the financing needs of aluminum processing enterprises, banks investigate the appropriate pledges in the inventory of financing enterprises, such as electrolytic aluminum and aluminum materials. Then, the bank joint logistics enterprises and regulatory warehouses design available inventory, regulatory inventory and corresponding inventory warning lines for financing enterprises under dynamic regulatory conditions. Then, the aluminum processing enterprises will be greater than the regulatory inventory of the pledged goods stored in the regulated warehouse, warehouse accordingly issued a warehouse receipt and pledge to the bank, the bank received the warehouse receipt after the loan to the aluminum processing enterprises. Finally, according to the amount of principal and interest of the loan returned by the aluminum processing enterprise, the bank lifts the pledge of the corresponding quantity of goods, and notifies the regulatory warehouse to release the inventory that has been removed from the pledge, and the business ends here. In dynamic pledge, aluminum processing enterprises can use free inventory to facilitate their normal operation.

Guangxi aluminum industry cluster development will produce the corresponding logistics park development needs. Banks and other financial institutions can carry out logistics park construction loans, logistics credit and settlement financial business with logistics park as the core. In order to avoid the development of the logistics park is not as expected, banks and other financial institutions should be combined with the local government industry planning, fully assess the future cash flow of the project, and adopt a dynamic adjustment method. For logistics parks with good operating conditions and strong management capabilities, a unified credit model can be adopted, which can

significantly reduce the higher costs incurred by banks and other financial institutions in directly serving long-tail customers. In the pre-loan investigation, it is necessary to focus on assessing the asset credit status of logistics park operators and their customers, reasonably calculate the credit line, often track the use situation, actively resolve various risks, and ensure the safe operation of unified credit.

Taking the financial institution's unified credit for the logistics park to carry out the financing warehouse business as an example, the bank chooses the aluminum industry logistics park as the cooperation object, and provides unified credit for the logistics park according to the financing needs of the aluminum industry enterprises in the park. Then, the logistics park provides inventory dynamic pledge service for customer enterprises through dynamic inventory under its own supervision. After the customer repays the loan, the logistics park releases its corresponding inventory and finally repays the unified credit of the financial institution.

6. Guangxi aluminum industry supply chain financial model

With the rapid and standardized development of Guangxi aluminum industry cluster under the guidance of the government, banks and other financial institutions can carry out more liquidity loans, fixed asset loans, infrastructure construction loans, domestic factoring, domestic and foreign trade financing, guarantee and other supply chain financial services in the supply chain of Guangxi aluminum industry chain. When carrying out supply chain finance business, the difficulty is to grasp the individual risk of customer enterprises and the overall risk of supply chain. Financial institutions should strictly review access and do a good job in pre-loan, loan and post-loan management. At the same time, it is necessary to fully understand the interaction and dynamics of the supply chain in addition to using a secure supply chain financial electronic system, and often assess business risks to ensure that no major risks occur.

Taking the upstream accounts receivable financing as an example, the supply chain formed by downstream aluminum processing enterprises, upstream electrolytic aluminum production enterprises and electrolytic aluminum trade enterprises, banks can finance the accounts payable of many aluminum processing enterprises due to the purchase of electrolytic aluminum. Since aluminum processing enterprises are mostly small and medium-sized enterprises, this business is more in line with the social responsibility of banks to serve the real economy and promote the financing of small and medium-sized enterprises.

In the downstream prepayment financing mode, aluminum processing enterprises and their downstream consumption terminals form a supply chain, and banks provide cooperation quotas for aluminum processing enterprises. When the downstream enterprise applies for credit from the bank, the bank gives the difference bank acceptance bill credit. After that, the bank, the aluminum processing enterprise and the downstream enterprise signed a tripartite agreement, which stipulated that the 'delivery notice' issued by the bank to the aluminum processing enterprise was the only valid document for the downstream enterprise to extract the goods. The downstream enterprises pay for the goods through the bank's acceptance bill, and then the aluminum processing enterprises discount from the bank. After the downstream enterprises apply for the withdrawal of the deposit, the bank will notify the aluminum processing enterprises to ship the goods. The business also has the characteristics of small and medium-sized services. Banks can consider copying the downstream prepayment financing model to banks and electrolytic aluminum enterprises and aluminum processing enterprises, or further extending it to alumina enterprises, so as to expand the business while concentrating the risk to the core enterprises with stronger strength, and improve the comprehensive benefits of bank supply chain finance.

7. Aluminum industry logistics finance and supply chain financial risk analysis

7.1. Market risk.

Because the price trend of bulk commodities such as alumina and electrolytic aluminum is affected by the macroeconomic situation at home and abroad, national and industrial policies, competitor capacity expansion, market supply and demand fundamentals and other factors, there may be sharp fluctuations, which will have a certain impact on the sales of enterprise products and the price of bank collateral. In response to this risk, banks should pay close attention to domestic and foreign macroeconomic trends and strengthen research on national and industry policies; do a good job in the market research of the aluminum industry and the analysis of competitors, pay close attention to the trend of competitors and downstream customers, the change of social inventory of aluminum ingots, and adjust in time to avoid risks; according to the pre-judgment of the market price trend, measures such as futures market hedging are adopted to deal with market risks.

7.2. Financial business and derivatives trading risk.

Because banks or customers may have problems such as imperfect mechanisms, inadequate control, misjudgement of market trends, improper trading strategies, and failure to stop losses in time during the operation of the futures market, they may affect the safety of loans. In response to this risk, banks or customers should strictly audit qualification; comply with the principle of hedging, resolutely put an end to speculation; set stop loss limit to prevent the infinite amplification of risks and losses; strengthen market research and judgment, continuously optimize hedging strategies, and strive to exert the positive effects and benefits of hedging; strengthen daily monitoring and audit supervision and inspection.

7.3. Safety production and environmental risk.

There are uncertain factors in the implementation of safety production management measures and the inspection of illegal operations, which may lead to adverse consequences such as casualties and property damage in aluminum enterprises. Due to the possible gap between environmental protection facilities and environmental protection standards, there are weak links in hazardous waste management, which may increase the risk of environmental pollution. In order to deal with this risk, the bank should carry out a full investigation on the safety and environmental protection of the enterprise before carrying out the business, so as to ensure that the customer enterprise meets the environmental protection regulations.

7.4. Supervision risk of logistics enterprises.

In logistics finance and supply chain finance, logistics enterprises can provide goods supervision services to replace or assist banks in risk control. However, the negligence and deception of logistics enterprises in the process of supervision will lead to regulatory risks. Financial institutions such as banks should improve the access standards of logistics enterprises, improve the level of supervision, seek regulatory guarantees, use electronic monitoring systems to participate in real-time monitoring of goods, and avoid illegal misappropriation of goods during the supervision process. Damage and other issues during transportation.

7.5. Customer credit risk.

Due to the change of customers' solvency due to the change of their performance ability, or because the bank fails to control its credit line according to the customer's credit status, it has a negative impact on the bank's business objectives. In response to this risk, banks should further improve the credit management system, establish a long-term mechanism, and formulate relevant system documents with high standards; implement financial integration and form collaborative management. Regular credit management and overdue accounts collection work, strengthen credit risk management; we strictly rate credit customers, keep an eye on the dynamics of credit customers, and make full use of technical means such as third-party credit reporting software to track and monitor in time.

8. Guangxi aluminum industry logistics finance and supply chain finance development countermeasures

With bauxite and aluminum ingots as pledge targets, mature business models such as commodity warehouse receipts, bills of lading and bill of lading pledge logistics finance are formed to promote the development of domestic and international multimodal transport 'one-order system' logistics finance. In such businesses, it is necessary to strictly select credible regulatory partners to reduce regulatory risks. In order to avoid excessive exposure of pledge price risk to banks, high-frequency supplementary margin system and mark-to-market system can be adopted, and withdrawal methods such as futures trading, guaranteed purchase and sale can be adopted. Complying with the development opportunities of the western land-sea new corridor of China and the Beibu Gulf port, we can expand the domestic and international multimodal transport 'one-order' comprehensive logistics financial services and build a structural trade financing model.

Strengthen cooperation with the aluminum industry logistics park, to explore the aluminum industry logistics finance and supply chain finance needs in infrastructure loans, unified credit, settlement and other directions. Aluminum industry logistics has the characteristics of long distance and high concentration, which is suitable for wholesale loans. With the accelerated development of Guangxi comprehensive aluminum industry logistics parks, the concentration of logistics warehousing to production and manufacturing, the upgrading of logistics park services, and the cooperation between financial institutions and logistics parks will be more efficient. From the financing needs of the construction of the park to the capital needs of the production, operation and logistics of the aluminum industry enterprises, it can be met through a variety of logistics finance and supply chain finance models in cooperation with the logistics park.

Focus on the mature development of SME business model, reduce management costs and improve overall efficiency. In addition to a few large backbone enterprises, Guangxi has a large number of small and medium-sized aluminum processing enterprises, they are the main body of financial institutions to expand customers. Financial institutions can accelerate the research layout and integrate more downstream SMEs into supply chain finance while providing services to upstream and midstream core enterprises. Traditional supply chain finance needs to accelerate the upgrading of online supply chain factoring model supported by science and technology, reduce the average cost and improve the comprehensive benefits of supply chain finance.

Promote Shanghai Futures Exchange to establish a delivery warehouse in Guangxi, or establish a regional futures trading delivery center. At present, the non-ferrous metal delivery warehouse designated by the Shanghai Futures Exchange is mostly around the futures exchange and the downstream processing enterprises of the aluminum industry. It is mainly distributed in the Yangtze River Delta and Pearl River Delta regions, and is far away from upstream and midstream enterprises, which makes it difficult for upstream and midstream enterprises to enjoy the logistics and financial

services of the delivery warehouse, which is not conducive to attracting futures customers in the central and western regions. The completion of a high-standard delivery warehouse in Guangxi will help a large number of enterprises to enjoy high-quality logistics finance and supply chain financial services, revitalize inventory and ensure production.

References

- [1] Breckwoldt T. *Management of grain storage in Old Babylonian Larsa* [J]. *Archiv fur, Orientforschung*, 1995(5):42-64.
- [2] Giovannucci D, Varangis P, Larson D. *Warehouse Receipts: Facilitating Credit and Commodity Markets* [J]. *SSRN Electronic Journal*, 2001.
- [3] Poe T. R. *Subjective Judgments and the Asset-Based Lender* [J]. *Commercial lending Review*, 1998, 13, 67-70.
- [4] Ronald J. Mann. *Explaining the Pattern of Secured Credit* [J]. *Harvard Law Review*, 1997, 110(3): 625-683.
- [5] Hofmann E. *Supply Chain Finance: some conceptual insights* [M]. 2005.