

Feasibility Study on the Financing of Oil Trade Warehouse Receipts in China (Zhejiang) Pilot Free Trade Zone Based on Digital Supervision

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Abstract: Oil products are important commodities related to the national economy and the people's livelihood. The order of oil products market is related to the safety of people's lives and property and the stability of the entire market economic order. After the gradual opening of the domestic oil market, private oil enterprises have gradually become a main force to maintain the stability of the oil market and promote the circulation of oil products. With the increasingly fierce competition in the industry, the price of oil products has risen too fast, and private oil companies are facing capital problems and are difficult to conduct business. Warehouse receipt financing business is proposed as a solution to the problem timely. This paper combines the hardware and software facilities of the oil industry chain in the China (Zhejiang) Pilot Free Trade Zone, using the oil storage supervision system and blockchain technology, together with oil enterprises, warehousing enterprises, trading platforms and banks, to build the oil warehouse receipt financing system. It is proved that the financing of oil warehouse receipts in the China (Zhejiang) Pilot Free Trade Zone can avoid most risks and form a win-win situation.

Keywords: Warehouse receipt financing; Oil trade; Blockchain; Internet of Things; Zhejiang Free Trade Zone

1. Introduction

Warehouse receipt financing is also known as "warehouse receipt pledge financing", that is, enterprises deposit their full-ownership goods in the warehouse company designated by the commercial bank while pledge the warehouse receipt issued by the warehouse company in the bank as a financing guarantee. The bank provides short-term financing business for enterprises to operate particular trade of goods similar to the warehouse receipt goods according to the pledged warehouse. Warehouse receipt financing can effectively solve the problem of small and medium-sized enterprises' lack of fixed assets as collateral and guarantee. It can also reduce the company's operating costs, revitalize the enterprise's book capital, speed up the enterprise's business turnover, improve the enterprise's business initiative, and expand the enterprise's market share^[1].

Warehouse receipt financing originated in Europe. After years of development, it has become a very mature business model in foreign countries, and has a strong applicability for the trade of bulk goods with high liquidity. While promoting the development of trade, it will also form a win-win situation for the business development of traders, banks and third-party warehousing enterprises. However, warehouse receipt financing started late in China and its business development was not mature enough, which led to the occurrence of Shanghai Steel Trade Case, Qingdao Port Fraud Case and other events, making banks more cautious in warehouse receipt financing business. At present, the problems of warehouse receipt financing

mainly include the inconvenience of bank supervision of goods, repeated pledge of goods, lax warehouse supervision and so on. Based on the analysis of the current situation of the oil market and the oil industry chain in the Zhejiang Free Trade Zone, this paper explores the feasibility of the normalization of the oil trade warehouse receipt financing business.

2. New Financing Needs for New Business Forms in Oil Market

China's oil industry implemented a planned economic management system before 1998. Then China National Petroleum Corporation (CNPC) and China National Petroleum and Chemical Corporation (Sinopec) started restructuring since 1999. The reform of the circulation system centered on the oil price reform began to deepen. The price of crude oil was in line with the international oil market. And refined oil price can base on the government-guided price benchmark instead of government pricing mechanism. In recent years, the government has issued a series of measures to encourage the circulation of refined oil, to carry out special rectification of the refined oil market, to strengthen market supervision, and private enterprises and foreign capital can be access to terminal gas stations, making oil trade market more and more marketization, standardization and transparency. While the market competition is increasing fiercely^[2].

2.1 Rapid Growth of Oil Enterprises

In 2019, the General Office of the state Council issued the Opinions of the General Office of the state Council on Accelerating the Development of Circulation and Promoting Commercial Consumption, and the Ministry



of Commerce issued the Notice of the Ministry of Commerce on the Reform of "Decentralization and Servicing" in the Distribution Management of Petroleum Products, and the approval of the qualification for the wholesale and storage of petroleum products had been cancelled, meanwhile the approval for the retail operation of petroleum products was delegated to local authorities, thus the number of domestic oil products enterprises began to increase rapidly and reached the highest point about 97,700 in 2020 (Figure 1), showing that a large number of enterprises and capital had poured into the oil industry after the reform, which had improved the market order of the circulation of refined oil, making the market more active, making the oil trade more market-oriented, which could better reflect the oil price. On the other hand, this also had a significant impact on the oil industry, resulting in more fierce competition in the industry and higher requirements for oil enterprises.

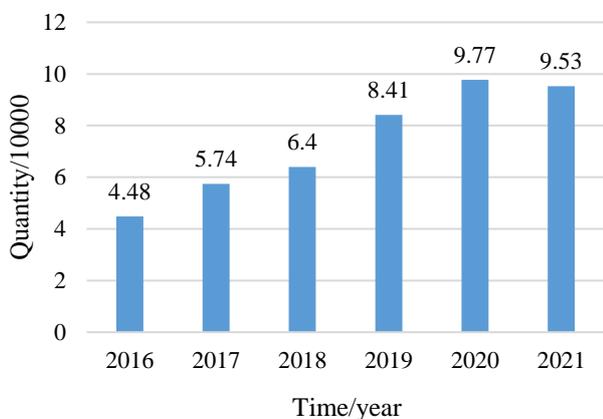


Figure 1 Number of Domestic Oil Enterprises

2.2 Industry Supervision Tends to be Stricter

Since the full liberalization of the refined oil industry in 2019, the government has issued a series of policies in accordance with the market situation to strengthen the supervision of the refined oil market. The Announcement of the state Administration of Taxation of the General Administration of Customs of the Ministry of Finance on the Imposition of Consumption

Tax on Imported Products (No. 19, 2021) clarifies that consumption tax on imported products such as mixed aromatics, light cycle oil and diluted asphalt has been levied, which has reduced the import volume of above three products by nearly 80% after the implementation of the policy, stopping the tax loopholes related to above tax-free mixed aromatics, light cycle oil and diluted asphalt .The government also tightened the import quota of non-governmental trade crude oil, strictly investigated the allowed reselling of non-governmental trade crude oil imports, and effectively curbed the illegal expansion of local refining capacity. At the same time, the local oil refining enterprises in the Northeast and Shandong have carried out unprecedented tax inspection activities, and severely cracked down on illegal acts such as ticket pasting, ticket changing and false invoicing^[3].

However, phenomena like tax evasion and tax evasion in the refined oil industry, selling refined oil without tickets, low-quality and low-cost blended oil entering the market, still exist.

These refined oil products with prices significantly lower than the market price have a great impact on the normal operation of the market, which has affected the normal finished oil trade a lot, making the competitiveness of oil trading enterprises lower^[4].

2.3 Oil Price Fluctuates Wildly

In recent years, affected by the international situation and the COVID-19, the price of domestic refined oil has fluctuated wildly. The crude oil price reached a negative level in 2020 and the domestic product oil price also reached the bottom(Figure 2), After that, the price of refined oil were rising all the way and reached the highest point after the Russian-Uzbekistan conflict in 2022. During this period, the highest price of gasoline increased by 99.3% compared with the lowest price, and the highest price of diesel increased by 86.3% compared with the lowest price. The increase in the price of refined oil has led to an increase in the purchase cost of oil trading enterprises, resulting in a high capital occupancy rate and an increase in the financing demand of oil trading enterprises.

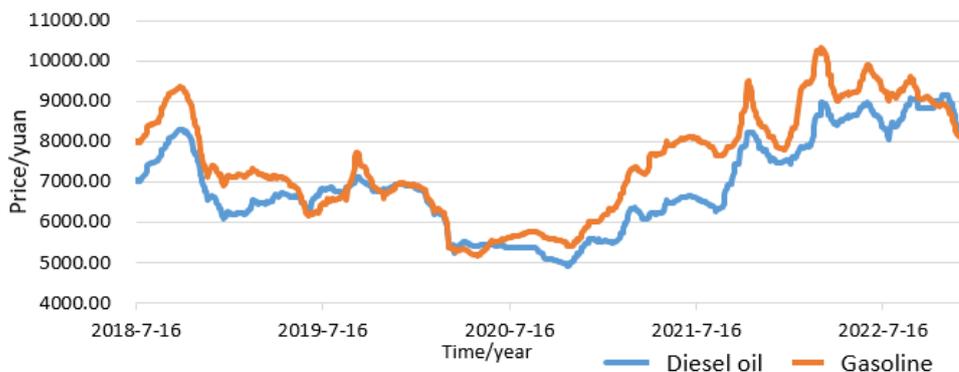


Figure 2 Change of domestic refined oil price

2.4 Financing Difficulties of Small and Medium-sized Trading Enterprises

Oil trading enterprises have become an important force that cannot be ignored in the development of oil industry. If oil trading enterprises want to develop rapidly, capital demand is essential. However, due to the nature of oil trading enterprise, such as lack of fixed assets, high risk of oil business management, lack of transparency in corporate finances, the lack of transparency of the financial situation of the enterprise, the low credit rating of the enterprise and the short survival rate of the oil trading enterprises, as well as the global economic downturn and the tightening of macroeconomic policies in recent years, all of these have led to the frequent setbacks of the oil trading enterprises in the demand for bank direct financing. It makes bank financing application extremely difficult [5].

With the full liberalization of the refined oil industry, the industry opportunities are increasing, and the competitive pressure are also increasing. Oil trading enterprises need to deposit a large amount of deposit or adopt the method of payment before delivery when purchasing from upstream. At the same time, they need to maintain a certain amount of inventory to ensure sales to downstream, resulting in a higher occupancy rate of operating funds. In addition, the rise in oil prices in recent years has increased the cost of purchasing, requiring a large amount of short-term financing to maintain operating turnover, while it is difficult to apply directly to the bank for financing. Therefore, oil trading enterprises' demand of warehouse receipt financing is particularly urgent.

3. Risks and Countermeasures of Oil Warehouse Receipt Financing

The risk of warehouse receipt financing refers to the risk caused by the inability to accurately judge uncertain factors in the business process. It is mainly divided into three aspects, the risk of supervision of cargo rights, the risk of clarity of cargo rights and the risk of price fluctuation.

3.1 Digital Technology to Cope with the Risk of Goods Supervision

In warehouse receipt financing, third-party warehousing enterprises perform the duties of supervisors. Third-party warehousing enterprises are the only operating places for good's warehousing and storage and delivery. The importance of warehousing enterprises is self-evident. The supervision risks of warehousing enterprises on goods are as following, firstly the risk of management of goods in warehousing and delivery. If operate improperly, the goods may be reduced or deteriorated, resulting in a substantial reduction in the value of goods, secondly, the trade risk of goods in storage, if the price of goods rises, the warehouse may sell the goods without permission for high profit and replenish the goods before delivery, resulting in the goods are not the same batch of goods.

In case of the risk of goods rights supervision, digital goods supervision can help a lot. Install the Internet of Things gateway in the storage tank could detect the liquid level in the tank time to time, automatically calculate the quantity of inventory changes, and achieve real-time monitoring of goods in the warehouse and upload all business data including warehousing and delivery. So that the owner can view business details and inventory online, and establish strict supervision logic for inbound and outbound, and reduce the risk of manual operation through online multi-instruction operation.

3.2 Dealing with the Risk of Cargo Rights Based on Blockchain Technology

After warehousing, it is necessary to ensure that the cargo right is clear and there will be no repeated pledge problems of the same batch of goods. When the warehouse receipt is transferred, the goods right shall be transferred to the transferee at the same time. When delivery the cargo right should be transferred to the oil enterprises to ensure that the cargo tickets are not separated.

In case of above risk, blockchain technology can help achieve clear cargo rights [6]. The blockchain technology adopts the decentralized and decentralized distributed database technology scheme. Its database is jointly maintained by the nodes participating in the system, and can only be queried and added, while cannot be modified and deleted. It has the characteristics of decentralization, security, transparency, and tamper-proof. Therefore, it is only necessary to process the goods on the chain when warehousing, and this batch of goods will be unique. During the transfer process, the right of goods will be reversed clearly, making the goods more mobile.

3.3 Use the Trading Platform to Deal with the Risk of Price Fluctuation

The domestic oil spot market is greatly affected by the international crude oil price and the domestic oil supply and demand relationship, which will result in price changing time to time and the value of financing goods will drop significantly in a short time occasionally. This will lead to the risk that oil companies will abandon the goods due to the fast decline in the price of goods, and will lead the bank to dispose the abandoned goods.

The trading platform can establish a commodity price index through a large amount of trading data obtained from the spot market, providing a reference for commodity price fluctuations. At the same time, the trading platform can play the role as the warehouse receipt trading platform to make the transfer of warehouse receipts more convenient and efficient. In case that cargo owner may abandon the goods, they can also use the trading platform to sell the goods in time to minimize losses.

4. New Exploration of Oil Warehouse Receipt Financing

4.1 Current Situation of Oil and Gas Industry in China (Zhejiang) Pilot Free Trade Zone

Since its listing on April 1, 2017, China (Zhejiang) Pilot Free Trade Zone has been striving to build the project of "one center, three bases and one demonstration zone", that is, "one center" refers to the international oil trading center; "Three bases" refer to international maritime service base, international oil storage and transportation base and international petrochemical base; "One demonstration zone" refers to the RMB internationalization demonstration zone for cross-border trade of bulk commodities. On this basis, we will continue to strengthen the construction of the entire oil and gas industry chain, improve the marketable allocation capacity of oil circulation, and create a better oil trade environment.

4.1.1 Warehousing Resources based on Digital Supervision

At present, there are 41 oil and gas storage and transportation projects have been completed in Zhoushan area of China (Zhejiang) Pilot Free Trade Zone, with oil storage capacity of 35 million cubic meters, accounting for about 1/3 of the total coastal oil storage capacity of the country, including 8 million cubic meters of national reserves, 13 million cubic meters of self-use warehouses, and 14 million cubic meters of third-party commercial warehouses, which will reach a storage scale of 100 million tons in the future.

In terms of storage management, the oil storage supervision system using big data supervision and Internet of Things technology has been fully launched in June 2022. With the storage capacity of 550 oil tanks with 14 million cubic meters, there are 20 oil storage enterprises in Zhoushan have already been under supervision of the system. The oil storage supervision system has transformed the original spot-check management into the refined closed-loop management of each single business, realizing the "senseless supervision" of enterprises, grasping the new trends of the oil storage industry and the trade industry timely, effectively preventing illegal acts such as offline ticket change and pilferage, and strengthening the supervision during and after the event.

4.1.2 International Oil Trading Center

Zhejiang Mercantile Exchange Co., Ltd. (herein after as ZME), as the basic platform for the construction of "International Oil and Gas Trading Center" in China (Zhejiang) Pilot Free Trade Zone, has been committed to exploring the development of forward contracts, forward transactions and derivatives trading based on spot trading.

ZME released the "China Zhoushan Low Sulfur Fuel Oil Bonded Ship Supply and Quotation" in June 2021. It is the first RMB quotation mechanism based on the domestic futures market price and launched the bonded

goods registration system in December 2022, with the characteristics of blockchain technology "uniqueness, traceability and tamper-proof", through data sharing and authentication, realizing the whole process management and ownership confirmation of bonded goods, effectively solving the problems of "repeated pledge" in bulk commodity warehouses.

At present, ZME has already agglomerated more than 2,800 member enterprises.

After long-term tracking of the oil trading prices of member enterprises, ZME has initially formed a variety of oil price indexes, which can provide a fair and reliable price reference for banks and oil enterprises as the third-party. Furthermore, the oil trading platform developed by ZME has been put into use online, which can operate the whole process of warehouse receipt transfer and can promote the efficiency of warehouse receipt transfer. In case that warehouse receipt cargo owner does not want the goods, ZME can help to sell the goods among her member enterprises to reduce bank losses.

4.1.3 Financial System Based on Blockchain Technology

In order to further deepen the reform of "deregulation and service" and strengthen financial support for the reform and development of China (Zhejiang) Pilot Free Trade Zone, the Zhejiang Banking and Insurance Regulatory Bureau and the Ningbo Banking and Insurance Regulatory Bureau jointly issued the Notice on Issues Related to the Market Access of the Banking and Insurance Industry in the China (Zhejiang) Pilot Free Trade Zone on February 25, 2021, aiming at supporting eligible private capital to initiate the establishment of banking and insurance institutions in China (Zhejiang) Pilot Free Trade Zone, supporting qualified private capital to participate in the establishment of Sino-foreign joint venture banks and insurance institutions in China (Zhejiang) Pilot Free Trade Zone, supporting foreign banks to set up subsidiaries and branches in China (Zhejiang) Pilot Free Trade Zone, supporting financial leasing companies to set up professional subsidiaries and project companies in China (Zhejiang) Pilot Free Trade Zone, encouraging the establishment of functional licensed institutions such as business divisions, specialized branches and specialized insurance centers that can play the role of functional integration and traction in light of the strategic development positioning of each Free Trade Zone and the demand for financial services. Encouraged by the policy, major banks have focused on exploring the development of oil and gas business actively. And China Zheshang Bank Co., Ltd has come to the forefront. By connecting its independently developed blockchain BaaS platform with the basic platform of the Internet of Things, Zheshang Bank has created a platform-based "blockchain+Internet of Things" application service, which can realize risk pre-warming and improve the level of post-loan risk management and control and significantly reduce the average operating cost of credit business by supervising the operation status of

customers.

4.2 Financing Process of Oil Warehouse Receipt in China (Zhejiang) Pilot Free Trade Zone

China (Zhejiang) Pilot Free Trade Zone owns a business friendly environment for oil enterprises by agglomerating more than 9300 oil enterprises, owing a commercial inventory of 14 million cubic meters and having a professional local trading center, establishing the oil storage supervision system led by Zhoushan Bureau of Commerce, together with the financing assistance of major banks in Zhoushan and the blockchain technology. So ZME has improved the whole process of warehouse receipt financing business by connecting customers, warehousing enterprises and banks.

The flow chart of warehouse receipt financing is shown in Figure 3 below.

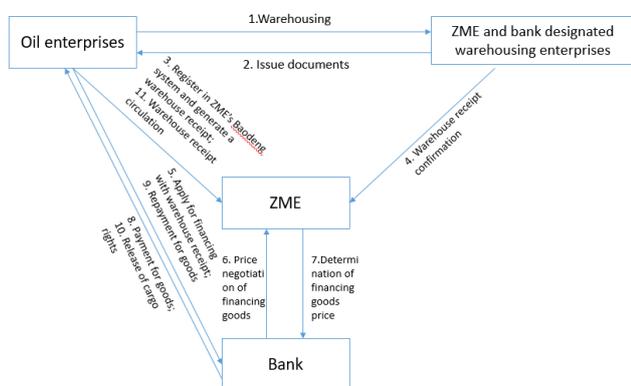


Figure 3 Flow Chart of ZME Oil Warehouse Receipt Financing

After the goods are stored in the warehouse, the Zhoushan Oil Warehousing Supervision System will start to work immediately to realize the real-time supervision of the oil inventory in the warehouse and the corresponding status of the goods in the warehouse through multi-dimensional cross-comparison of the data of incoming and outbound storage, liquid level data, warehouse receipt data, inventory data and ship data. After authorization, banks, traders and warehousing enterprises, can obtain the owner information, the variety, quantity, real-time inventory status and other data through the system. Goods owner register all the information in ZME's Baodeng system so that the ownership of this batch of goods is clear with the characteristics of "uniqueness and traceability". Related bank can determine the immediate price of the goods through ZME's price information. When the price of the goods falls, related bank can judge the market quotation in time and decide whether to notify the oil enterprises to supplement the margin. In case the goods owner has abandoned the goods, ZME can help banks to quickly handle goods and reduce bank losses. After the oil enterprises redeem the warehouse receipt and cargo right, they can circulate the warehouse receipt on ZME's trading platform to increase the delivery efficiency.

4.3 Successful Case of Oil Warehouse Receipt Financing in China (Zhejiang) Pilot Free Trade Zone

In November 2021, the first integrated application of ZME warehouse receipt issuance and pledge financing system in cooperation with Zhejiang Commercial Bank Zhoushan Branch and Sinochem Xingzhong Oil Depot was successfully implemented.

First, ZME member submitted the registered warehouse receipt application on ZME platform system. Secondly Sinochem Xingzhong Oil Transfer (Zhoushan) Co., Ltd. approved and issued above warehouse receipt. Then ZME member applied for financing needs with warehouse receipts to Zhejiang Commercial Bank Zhoushan Branch and Zhejiang Commercial Bank Zhoushan Branch approved loans according to warehouse receipt. The whole process has realized operation of warehouse receipt registration, pledge application and financing application and Loan issuance online, which only takes 2 hours from. With the features of "uniqueness and traceability" the relevant warehouse receipt data involved in this business has also been synchronized to the block chain platform of ZME data system in real time, becoming the first batch of online data. In addition, the relevant warehouse receipt can still participate in online transactions of ZME after the pledge is released.

5. Summary

In the case of fierce competition in the oil market, the oil warehouse receipt financing in the Zhejiang Free Trade Zone can alleviate the short-term capital shortage, reduce the company's operating costs, increase the turnover of goods, and promote the rapid development of oil enterprises. Warehouse enterprises can expand business, increase customer source and increase business income. ZME can provide customers with convenient price index and warehouse receipt trading services, increase customer number and help customers better understand the market while obtaining warehouse receipt trading revenue. Banks can avoid the risk of regulation and price decline, reduce the business risk to the minimum, and form a win-win situation of more release and promote the circulation of oil products in the domestic market.

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