



Study on Ship Registration Mechanism of Attracting Chinese- Funded Foreign Ships to Hainan Free Trade Port

---Big data analysis based on nationality of Chinese-funded ships

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Abstract. Based on the analysis of big data on international Chinese-funded ship registration, this article finds that the proportion of Chinese-funded ships registering under convenient flags has been increasing year by year. This is highly detrimental to the concentration of shipping factors and the development of the shipping industry. The construction goals of Hainan Free Trade Port include attracting more Chinese-funded international ships to register in the port. However, the current development situation is still not ideal. By comparing the ship registration systems in places like Hong Kong and Singapore, this article discovers that the current ship registration system in Hainan Free Trade Port still suffers from the strict registration of complex procedures and overly strict requirements. Therefore, the article proposes suggestions such as relaxing the registration system and providing multiple support services to attract more Chinese-founded foreign ships to return for registration.

Keywords: Hainan Free Trade Port; International ship registration; reform

1 Introduction

According to the analysis of the big data of the ship registration of the United Nations Commission on Trade and Development (UNCTAD), by 2019, the tonnage of Chinese capital international sailing ships flying flags of convenience accounted for 55.9%, and in the past four years, the proportion increased year by year. The "expatriation" of a large number of Chinese-funded ships makes it impossible for China to gather shipping factors effectively, which directly impedes the development of shipping economy and high-lever shipping industry, and is not conducive to the effective implementation of the strategy of China's maritime power and maritime power.

In June 2020, it was clearly pointed out in the Master Plan for the Construction of Hainan Free Trade Port issued by The State Council that Yangpu Port of China should be taken as the registered port of ship, the ships inspection should be gradually simplified, the legal inspection of ships should be opened, the ship registration center of

Hainan Free Trade Port should be established, and the registration procedure should be continuously reformed to make it more convenient and efficient. Therefore, in the future, the ship registration will become one of the important contents of the construction of Hainan free Trade port [1].

This paper intends to use big data to analyze the nationality of Chinese-funded ships and put forward suggestions on the construction of ship registration system in Hainan Free Trade Port.

Big data analysis is a process of analyzing a large amount of collected data with appropriate analysis methods, classifying and summarizing it with efficient analysis tools, extracting the most valuable information, concluding effective conclusions, and mining the maximum value of data. According to the analysis of the big data of the ship registration of the United Nation Commission on Trade and Development (UNCTAD) by 2019.see Tables 1& 2.

The tonnage of Chinese capital international sailing ships flying flags of convenience accounted for 55.9%, see figure 1&2 and in the past four years, the proportion is getting bigger year by year. see table 3, table 4 and figure 1&2. The "expatriation" of a large number of Chinese-funded ships makes it impossible for China to gather shipping factors effectively, which directly impedes the development of shipping economy and high-lever shipping industry, and is not conducive to the effective implementation of the strategy of China's maritime power and maritime power.

Table 1. Fleet ownership and registration, main economies, 1 January 2019 Vessels (Number of vessels)

Flag of registraion (Ranked by number of ships registered)								
(numbers of vessel)	Panamam	China	Liberia	Marshall	Singapore	CHina,HK	Indonisia	world
China	573	3987	60	53	51	905	7	6125
Greece	454	0	958	952	32	20	1	4536
Japan	2060	0	178	189	128	58	9	3822
Singapore	257	2	152	122	1511	131	87	2727
Germany	32	1	673	137	70	20	0	2672
Indonisia	17	1	7	0	7	4	2062	2145
Norway	54	0	85	126	95	41	4	2038
U.S.America	74	0	95	356	6	49	0	1978
Rusian	35	0	130	1	2	1	0	1707
Korea	455	0	43	255	3	25	5	1647
World	6465	4039	3456	3454	2600	2442	2216	51684

Sources: UNCTADstat(UNCTAD,2019a); Clarksons Reseach.

Note: Commercial ships of 1000 gt and above;beginning-of-year figures

Table 2. Fleet ownership and registration, main economies, 1 January 2019 Tonnage (Thousands of dead-weight tons)

Flag of registraion (Ranked by Tonnage registered)								
tonnage	Panamam	China	Liberia	Marshall	Singapore	CHina, HK	Indonisia	world
China	573	3987	60	53	51	905	7	6125
Greece	454	0	958	952	32	20	1	4536
Japan	2060	0	178	189	128	58	9	3822
Singapore	257	2	152	122	1511	131	87	2727
Germany	32	1	673	137	70	20	0	2672
Indonisia	17	1	7	0	7	4	2062	2145
Norway	54	0	85	126	95	41	4	2038
U.S.America	74	0	95	356	6	49	0	1978
Rusian	35	0	130	1	2	1	0	1707
Korea	455	0	43	255	3	25	5	1647
World	6465	4039	3456	3454	2600	2442	2216	51684

Sources: UNCTADstat(UNCTAD,2019a); Clarksons Reseach.

Note: Commercial ships of 1000 gt and above;beginning-of-year figrues

Table 3. Fleet ownership and registration, main economies, from 2019 -2022

Year	China flag	Chinese-funded total	Foreign flag	China flag ratio
2019	3987	6125	2138	65.094%
2020	4569	6869	2300	66.516%
2021	4887	7318	2431	66.781%
2022	5357	8007	2650	66.904%

Table 4. Fleet ownership and registration, main economies, from 2019 to 2023 tonnage (thousands of dead-weight tons)

year	china flag	Chinese-funded total	foreign tonnage	China flag tonnage ratio
2019	90930	206301	115371	44.076%
2020	100269	229247	128978	43.738%
2021	105657	244556	138899	43.204%
2022	113036	277843	164807	40.683%

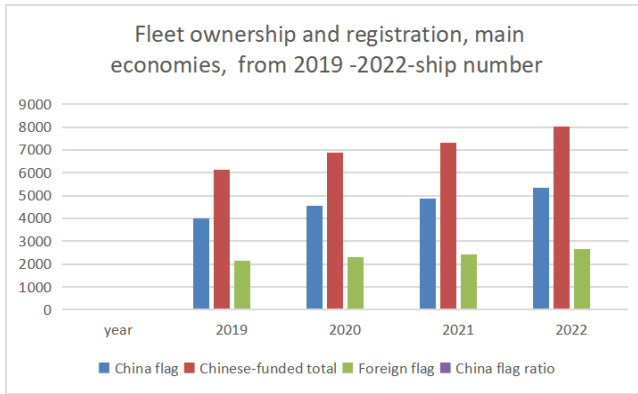


Fig. 1. ships number from 2019-2022

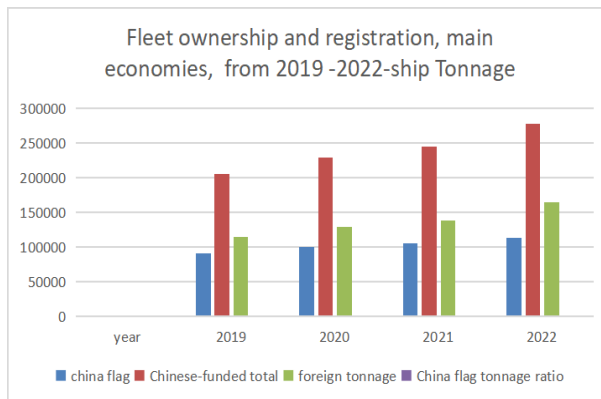


Fig. 2. ships Tonnage from 2019-2022

This paper conducts a preliminary study on the establishment of a free, convenient and systematic international ship registration system to promote the repatriation of Chinese-funded flag of convenience ships and attract foreign-funded ships to register in Hainan Free Trade Port.

2 Development status of China's International Shipping Registration System

For the traditional registration, it can be divided into two types, one is strict registration; the other is to open enrollment. Under the background of the increasing number of ships with flags of convenience, the development of the shipping industry of some countries has been affected to a certain extent. In order to attract some foreign ships to fly their national flags back home, they need to constantly expand the fleet of ships and strengthen their own shipping supervision and comprehensive strength. Therefore, the registration system was born, also known as the secondary registration system. The

second ship registration system includes offshore registration and international ship registration, and the system is relatively strict in terms of registration conditions. Compared with the open registration, the secondary ship registration is relatively strict and belongs to the semi-open registration system.

As for international ship registration it mainly aims at solving the problem of registering international shipping of the same nationality in other countries. The essence of the system is to emulate some preferential policies of flag of convenience countries, relax registration conditions, and enable more ships to return to the home country for registration, so as to strengthen the shipping of the country [2]. Compared with other countries' ship registration systems, our country has mainly experienced four stages of development. Stage one is the special cases duty-free registration policy; the second stage is "China Yangshan Port" international ship registration system; the third stage is the international ship registration system of Tianjin Dongjiang Bonded Port Area; the fourth stage is the international ship registration system of the China (Shanghai) Pilot Free Trade Zone. Among them, the special case duty-free registration policy in the first stage is mainly to attract Chinese-funded ships of foreign nationality back to China for registration and to fly the "five-star flag" through the implementation of corresponding preferential tax policies. Although this policy can effectively attract the Chinese-funded ships to return to China for registration, the number of registered ships is relatively small. The second stage of "China Yangshan Port" international shipping registration system is an innovative embodiment. It not only implements corresponding tax incentives for ships, but also provides export tax rebates for worldwide shipping ships registered in "China Yangshan Port". At the same time, it also has the contents of opening the scope of legal inspection of ships. The third stage of the international registration system of Tianjin Dongjiang Bonded Port area emphasizes the conditions of ship registration and has certain requirements for the conditions of ship registration. Stage four of the China (Shanghai) Experimental Free Trade Zone international Shipping Registration system is also the current system of China at present. Its main innovations include the establishment of two shipping ports, namely Yangshan Port, China and Shanghai, China. Among them, Yangshan Port (China) has implemented the bonded registration and Shanghai (China) has implemented registration after duty paid, and the system has relaxed the proportion of foreign shipping as a share in international shipping vessels. Give the international registration system strong attraction and openness.

3 The experience of Hong Kong and Singapore's international ship registration system

3.1 Registration Rules

(1) In the subject of ship registration. Hong Kong's new requirement is to be a "qualified person" with more than half of the interest, while Singapore's requirement is to be a permanent resident or a local company, limiting only the proportion of shares held by the company and the tonnage of the ship. As for China's registration system, it has

relatively strict requirements on the subject, which requires Chinese investment to account for more than 50% before registration. After comparison, it is found that the registration system of Hong Kong and Singapore has relatively loose restrictions on subjects, which attracts foreign ships to enter the port for registration and improves the flow rate and international competitiveness of ship registration to a certain extent [3].

(2) Age of the ship. As for Hong Kong, it mainly implements the Flag Country Quality Management mode (FSQC) and the Pre-Registration Quality Management (PRQC) system, which has relatively low requirements on the age of ships. Usually, it only needs to evaluate the overall situation of scrapped ships, and if the safety inspection meets the relevant safety requirements, it can continue to operate, while the age of ships in Singapore is 17 years. However, it is clearly pointed out in the regulations of Old Transport ship Management that if the ship has reached the age of scrapping, it needs to be forced to scrap. In this context, we have reduced the number of ship registrations to a certain extent.

(3) Nationality of crew members. Hong Kong, for its part, has no restrictions on the nationality of sailors, nor does Singapore. However, in China, there are corresponding requirements for the nationality of crew members. Generally speaking, the personnel serving as Chinese captain must have Chinese nationality. If foreign personnel need to be hired, they need to report to the Ministry of Transport for approval. By contrast, Chinese sailors' nationality requirements are strict, which leads to the inability to find professional talents at home, making some of its positions scarce. In addition, due to the low employable cost, this increases the competitiveness in hiring sailors with professional ability.

(4) Ship taxes and fees. In Hong Kong, there are relatively large tax incentives for ships, such as the tariff reduction, value-added tax and business tax, and the annual tonnage fee reduction plan is also implemented. In Singapore, the annual tonnage fee reduction and the exemption plan is also implemented, and the corporate income tax of 16.5% is levied. Meanwhile, the preferential for green ships is implemented [4]. Comparatively speaking, although there is no registration fee and the tonnage fee, the tax levied is relatively more, such as tariff, VAT, business tax and so on.

(5) Ship survey. In terms of ship inspection, Hong Kong is recognized as one of the nine major international classification societies, while Singapore is more relaxed in this respect. It usually just needs the corresponding certificate issued by classification societies, which provides convenient inspection and certification for the main body of the ship. However, in China, certificates issued by classification societies recognized by China are required, which, to a certain extent, limits the inspection and certification of the main body of ships. As a result, some ships returning to China have to pay more for switching classification societies

3.2 Registration procedures

(1) Application method and text. In terms of application text, Hong Kong usually uses format text mainly, such as authorization form, notes of sale, etc., And can submit by E-mail, which improves the efficiency of registration to some extent. At the time of registration in Singapore, the corresponding application form for registration, together

with the corresponding list of materials, is required only by a letter from the Registrar of Ships. However, for China, the application for registration needs to be carried out on site, and it does not support the transmission of application materials by email, which reduces the efficiency of application to a certain extent.

(2) Processing time, language and approval. For Hong Kong, the time limit for registration is 2h, which is mainly completed through the second-level approval system, and can be implemented in both Chinese and English, which improves the approval process to a certain extent. The same is true in Singapore. In China, although the processing time is 7 days and the three-level examination and approval system are adopted, the language only supports Chinese, and the subsequent review can only be carried out after the examination and approval personnel have completed the corresponding examination and approval. The processing process is relatively complicated.

(3) Cooperation with ship's inspection. For Hong Kong, it does not require the applicant to provide technical materials. In general, it only requires the classification society to provide the technical information required for registration to the Marine Department. However, in China, the applicant is required to provide ship technical materials to the registration department, and the application process is relatively complicated.

3.3 Supporting policies

In Hong Kong, the government has implemented supporting policies. In terms of ship financing, it has created a good environment for financing. Free trading of foreign exchange can be realized in the market, and the financing cost is relatively low, which attracts ships to register in Hong Kong to some extent. In terms of insurance, insurance companies with high credibility in the world have set up corresponding institutions in Hong Kong. According to the statistics of China Council for the Promotion of International Trade, as of June 2016, there were 84 authorized insurance companies in Hong Kong, among which 32 were foreign companies. Singapore and Hong Kong are roughly the same, both implementing preferential policies of flag conversion and duty-free policies [5]. For China, it is difficult to achieve ship financing. This is mainly because the loan term of shipbuilding in China is relatively short and the interest rate of the loan is high, which indirectly increases the financing cost and limits the financing channels and methods of Chinese ships. At the same time, due to the high tax cost, foreign ships are reluctant to return to China for registration.

4 Current situation and gap in international ship registration of Hainan Free Trade Port

Compared with the international ship registration of other countries, China's international ship registration system has roughly gone through three important stages, namely "special case tax exemption registration policy", "bonded port ship registration" and "free trade zone ship registration", but the system innovation has not achieved corresponding results, mainly due to the corresponding problems in maritime finance, tax-

ation, ship financing and other aspects. So that there is a certain gap with the world's famous international ship registration center. In this case, Hainan embarked on the exploration of shipping registration in 2014. The Hainan government issued the Implementation Opinions on Promoting the Construction of Shipping Hub and Logistics Center in Southeast Asia. In the opinions, it was clearly pointed out that "We should strive for the transfer of a number of Chinese-funded flag of convenience vessels to Hainan; try to take Yangpu Bonded Port Area or Sansha City as the innovation pilot of the international ship registration ". In 2020, The State Council officially issued the General Plan for the Construction of Hainan Free Trade Port. With the support of these policies, the improvement of the international ship registration of Hainan Free Trade Port has been promoted to some extent. However, at the present stage, Hainan International Ship Registration is still in the development stage, and most of the policy opinions only stay at the macro level and have not been fully implemented. Although Hainan Maritime Safety Administration issued the Regulations on International Ship Registration Procedures of Hainan Free Trade Port in 2020, the innovation of the regulations is relatively small, and there is still a certain gap compared with the relevant procedures and regulations on ship's registration in China. In addition, for the Hainan government, it has not issued relevant legislation on international ship registration for free trade ports. At present, ships registered at Yangpu Port of China are still handled according to the Regulations of the People's Republic of China on Ship Registration, the Measures of the People's Republic of China on Ship Registration and the Working Procedures of Ship Registration. Its registration process and method are roughly the same as that of domestic navigation ship registration [6]. As can be seen from the above analysis, there is still a big gap between current international ship registration of Hainan Free Trade Port and that of Hong Kong and other countries, as shown in Table 5.

Table 5. Comparison of international ship registration in Hong Kong and Hainan

project	Hainan	Hong Kong
proposal form	Apply on site and submit paper materials	The original application form should be submitted to the Hong Kong Marine Department on site or by mail, and the remaining materials can be submitted in electronic copies by email
formatting	There is no format text except for the application form	use the format text, such as sales, authorization forms, etc
Synergy with ship inspection	the ship registration applicant shall submit the technical data to the maritime ship registration authority on the site	The classification Society shall send the technical information directly to the Marine registry
Legal completion time limit	the newly promulgated and implemented Regulations on International Ship Registration Procedures of Hainan Free Trade Port stipulate that one working day is completed, and multiple matters are applied for in parallel	2h
register order	The time limit for completion can be extended appropriately, and the extended time limit shall not exceed 1 working day	
Examination and approval level	The newly promulgated Regulations on International Ship Registration Procedures of Hainan Free Trade Port stipulate the secondary examination and approval	Second-level approval
International ship registration	Has not yet been introduced	The Merchant Marine (Registration Ships) Ordinance

register rule	legislation	According to the ship registration of the People's Republic of China measures for the provisions of article sixty-eight, according to the law of the People's Republic of China in free trade area of Chinese enterprises, sino-foreign joint ventures, sino-foreign cooperative enterprises, and on the basis of the State Council free trade area related wholly foreign-owned enterprises and Hong Kong and Macao wholly owned enterprises of ships, can apply for international ship registration in accordance with the relevant provisions of this chapter	
	Foreign share ratio		unrestricted
form a complete set estate	age of vessel	the Regulations on the Administration of Old Transport Ships limit the age and mandatory scrapping life of imported ships	the requirement is loose, for the inspection over a certain age of the ship to obtain the corresponding qualification certificate, can be engaged in operation
	Quality supervision	No special regulations have been issued	PRQC:FSQC Overseas imported ships exempt from duty and value-added tax, Hong Kong flagship does not levy income tax and business tax, leased ships (regardless of the flag country) for international business, ship leasing income also do not need to pay income tax, registered in Hong Kong its non Hong Kong flag ship income, a lower corporate income tax
tax revenue	tax revenue	The Yangpu Port of China shall be registered in international transportation and Hong Kong, Macao and Taiwan transportation	Ship financing environment is good, low financing cost, foreign exchange can be freely bought and sold in the market
	financing	Financing is difficult, and the financing cost is high	Major international protection and compensation organizations Both have offices or offices in Hong Kong
	insurance	There are only a few insurance companies registered in Hainan, which has not yet formed a scale	

5 Countermeasures and suggestions for building the international ship registration system of Hainan Free Trade Port

5.1 Relax registration subject and age requirements

Whether to follow the model of Hong Kong and Singapore is still under exploration. In terms of ship age, due to the compulsory scrapping system implemented by China, ships that have reached their age but are in good condition flow to other countries [7]. Therefore, in the process of building the system, the policy conditions should be relaxed to attract foreign ships to register in Chinese ports. In terms of ship age, the Flag State Quality Management model (FSQC) and pre-registration Quality Management (PRQC) system of Hong Kong can be copied, and the quality management system should be established according to the actual situation of China's ship registration. By means of quality assessment of scrapped ships, some ships with qualified quality can be registered, which is not only conducive to increasing the flow of Hainan ship registration, but also to improving China's international competitiveness to a certain extent.

5.2 Reduce crew and classification society restrictions

It is still necessary to continuously enrich the choices of the main body of the ship and gradually reduce the employment cost, so as to attract foreign sailors to register in China. In addition, in terms of the selection of classification societies, China is still dominated by Chinese classification societies, which makes part of the ships transferred back to China need to be summoned by classification societies again, which complicates the ship registration to a certain extent. Based on this situation, China needs to constantly expand the selection of classification societies, not only rely on Chinese classification societies, but also increase corresponding classification societies like other countries, so as to provide convenient conditions for the ship registration.

5.3 Formulate favorable tax policies

In terms of preferential policies, Hainan Free Trade Port can improve the tax policy through free trade port legislation in accordance with the current tax policy of the international ship registration. For the shipping cost, the most important factor is the tax issue. In the process of China's development from "special case tax exemption policy" to "Yangshan Port of China", the export tax rebate policy involved has gradually matured. In particular, since the General Plan for the Construction of Hainan Free Trade Port was issued in 2020, corresponding requirements have been put forward for the registration of Chinese ships. First, corresponding tax rebates are required for ships built in China, registered at Yangpu Port of China and engaged in international transportation. Second, it is required to give the Yangpu Port as a transit port, engaged in domestic and foreign trade transport of the corresponding bonded oil; Third, the requirement to give the export tax rebate of the domestic and foreign trade transport production of fuel oil ships. Fourthly, the corresponding port tax refund policy is required for container goods that meet the conditions and leave through Yangpu Port. Therefore, in terms of policies, China should learn from the relevant policies of Hong Kong and Singapore, and give certain relief in terms of tariff and income tax.

5.4 adhere to the three principles of system integration and innovation, international advanced benchmarking and safety and quality assurance

(1) Highlight the integrated innovation of the system

For international ship registration, it includes not only ship inspection and registration, but also taxation, financing and other aspects, which directly affects the development of leading industries in Hainan free trade Port. Therefore, in the process of carrying out the international ship registration in Hainan, it is not only necessary to innovate the single system of ship registration and inspection, but also to constantly innovate the content of tax and financing related to international ships.

(2) Benchmarking international practices

As for the free trade port, it is the highest level of openness in the world at present. Compared with domestic free trade zones such as Shanghai and Tianjin, Hainan has been strongly supported by the free trade port policy in the process of international

shipping innovation. With the support of this policy, Hainan should constantly change its open attitude. To achieve reform and innovation by benchmarking the advanced practices of ship registration at internationally renowned free trade ports.

(3) Adhere to the principle of safety and quality assurance

In order to ensure the steady development of Hainan's international ship registration business, a corresponding high-quality ship registration system should be established to meet international standards in terms of navigation safety and cleanliness, which can not only effectively improve the quality of ship registration, but also establish a good reputation for quality to a certain extent.

5.5 create an efficient and convenient international ship registration procedure

Since the implementation of the Provisions on the International ship Registration Procedures of Hainan Free Trade Port in 2020, relevant provisions have been added to the international Ship registration China, which mainly includes the following points: First, the financial charter ship registration has been included in international ship registration; second, all shipping enterprises registered within the jurisdiction of Hainan or ships under financial lease can be registered in Yangpu Port of China. Third, it has enhanced the informatization construction, assisted the online handling of international ship registration business, and incorporated the "whole project" and "whole process" of the international ship registration into the "Internet + Maritime Government"; thirdly, data sharing is realized among various departments, so that Marine affairs and market supervision departments can automatically obtain the data information they need, and realize intelligent check of data information, which improves the accuracy of data information to a certain extent. Fourthly, the format of registration application materials should be changed, and the formal examination of front-line registrars should be completed through the format text, so as to improve the approval efficiency. Fifthly, the electronic certificate of ship should be promoted to facilitate the rapid inspection of ship information and realize the real-time transmission of ship information.

5.6 establish open rules for international ship registration

The open international ship registration rules mainly include the following points: first, foreign ownership ratio of the main body of international ship registration will be relaxed, and the registration will be open to ships owned by wholly foreign-owned enterprises; secondly, on the basis of ensuring safety and quality, the age restriction of ships should be relaxed to a certain extent, and the classification inspection and statutory inspection of ships should be lifted. Third, implement temporary registration of ships. For some ships that cannot provide the ownership certificate, corresponding registration will be given to facilitate the realization of ship operation and financing. Fourthly, the restriction of sailors' nationality should be abolished and foreign sailors should be allowed to serve as captains. Fifth, establish the corresponding ship regis-

tration quality management system, so as to improve the safety and quality of ships in Yangpu Port of China.

5.7 Build a comprehensive shipping service

In order to effectively improve the overall service quality of shipping, it is necessary to build a comprehensive shipping service industry. Therefore, Hainan maritime authorities should continuously optimize the layout of shipping service, integrate government and enterprise resources, give full play to the advantages of resource integration, and provide high-quality and all-round shipping services for Hainan International Shipping Register, which can be mainly carried out in the following aspects: First, preferential tax policies for shipping should be implemented. Certain preferential tax policies should be provided to some international shipping enterprises registered in Hong Kong, and individual income tax should be reduced for ocean-going seamen settled in Hainan international shipping enterprises. Secondly, to gradually create a good ship financing, and expand the financing channels, so as to reduce the financial cost of ships, and simplify the ship financing process, to provide the convenience for ship financing; Third, expand the business channels of Hainan shipping insurance, focusing on institutional innovation, so as to facilitate the integration with relevant international rules and broaden the horizon of China's shipping. In addition, relevant departments need to continuously optimize the insurance, make it more comprehensive, and add claim settlement procedures, so as to improve the insurance service [8].

In addition, in view of the actual problems existing in Hainan free Trade Port, relevant departments need to gradually improve the supporting policies related to the development of the shipping industry, such as extending the loan term, reducing the loan interest rate, etc., To attract some foreign companies to register in Hong Kong through preferential policies. At the same time, in terms of ship insurance, it is necessary to provide policy support for the registration of insurance companies in Hainan, following the example of Hong Kong and Singapore, so as to attract some foreign insurance to establish corresponding offices in Hainan, which plays a very important role in promoting the steady development of the international shipping industry in Hainan Free Trade Port.

6 Conclusion

As far as Hainan Free Trade Port is concerned, it is in the early stage of construction. Compared with open forms in the world, its policies are still in preliminary exploration. Therefore, in the future development process, it is necessary to constantly explore the corresponding means and actively explore a more convenient international ship registration system, so as to solve the problems caused by the high tax of the shipping industry, which plays a very important role in effectively improving the quality of Hainan international ship registration.

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