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Bahria University, Pakistan

## \*CORRESPONDENCE

Yuanhong Shi  
✉ CU214018@cupl.edu.cn

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# China's international ship registration system against the backdrop of construction of the Hainan Free Trade Port

Yuanhong Shi<sup>1,2\*</sup>, Yiji Shi<sup>2,3</sup> and Hui Zhou<sup>4</sup>

<sup>1</sup>International Law School, China University of Political Science and Law, Beijing, China, <sup>2</sup>Law School, Tulane University, New Orleans, LA, United States, <sup>3</sup>Law School, University of Zurich, Zurich, Switzerland, <sup>4</sup>Department of Mathematics, University of New Orleans, New Orleans, LA, United States

The international ship registration system is an important component of shipping policy. A review of its historical development in China reveals that its implementation has yet to achieve the intended outcomes. The construction of the Hainan Free Trade Port presents a valuable opportunity to advance the development of this system. Based on the Theory of Change Model, this study assesses the current state of China's international ship registration system within the context of the Hainan Free Trade Port. We also employ research methods such as SWOT analysis and comparative analysis to objectively assess the implementation of this innovative policy from both macro and micro perspectives, as well as from qualitative and quantitative angles. Our analysis identifies a range of persistent challenges, including imperfect supporting policies and insufficient regulatory oversight. In response, we propose a series of reform measures spanning legislative, judicial, and law enforcement dimensions. These include restructuring the taxation system for shipping enterprises, enhancing the regulatory framework for ship registration, and developing a robust system of ancillary services. Collectively, these reforms are essential for comprehensively strengthening the maritime soft power of China's shipping industry.

## KEYWORDS

Hainan Free Trade Port, ship registration, the rule of law, institutional innovation, supervision mechanism

## 1 Introduction

The international ship registration system plays an important role in the development of China's shipping industry. China's traditional system of ship registration has long been hindered by several limitations. Several restrictive conditions like heavy taxes and fees and the poor efficiency of ship registration have caused many local enterprises to register their ships abroad. It leads to a large number of Chinese shipowners sailing under foreign flags (Haralambides and Yang, 2003). Addressing this situation requires innovations in the

international ship registration system. The development of China's Pilot Free Trade Zones, and especially the construction of the Hainan Free Trade Port, provides a platform to simplify registration process and attract vessels back under the Five-star Red Flag.

In recent years, the Chinese government has placed increasing emphasis on strengthening the international ship registration system, particularly in the context of the development of the Hainan Free Trade Port. On May 11, 2022, the State Council issued the Reply on Agreeing to Temporarily Adjust and Implement the Relevant Provisions of Regulations of the People's Republic of China on Ship Registration at the Hainan Free Trade Port, wherein it agreed to temporarily adjust and implement the provisions of Article 2, Paragraph 1, Item 2 of these regulations. This adjustment effectively lifted restrictions on the proportion of foreign-funded shares in vessels registered at the Hainan Free Trade Port that are engaged solely in navigation and operations within the port area (People's Republic of China (PRC) Central People's Government, 2024). Subsequently, On March 4, 2024, the Maritime Safety Administration of the Ministry of Transport published new Work Rules for Ship Registration to further promote the development and modernization of the ship registration system (Maritime Safety Administration of the Ministry of Transport, 2024).

In short, when adjusting and executing the policy and regulations, it is necessary to examine its condition and the potential obstacles to it and provide further feasible suggestions for improvements. This is important to build a system to enhance efficiency, transparency, and oversight. This can also improve China's modern shipping fleet and contribute to the development of the international shipping market.

Therefore, the outline of the paper is as follows: Following this introduction, section 2 reviews the literature; Section 3 outlines the methods; Section 4 assesses current practices in Hainan; Section 5 evaluates the recent operational performance of the system through SWOT and comparative analysis, comparing its development domestically and internationally, while identifying existing issues. Section 6 offers legislature and policy recommendations from a comparative perspective. Section 7 is the conclusion.

## 2 Literature review

### 2.1 Hainan Free Trade Port shipping policy

In terms of shipping policy at the Hainan Free Trade Port, there is limited domestic research. Many studies primarily focus on institutional innovation and policy analysis within China's pilot free trade zones and the Hainan Free Trade Port. He and Yan believe that a series of innovative measures in the development of the Hainan Free Trade Port aim to strengthen trade relations, particularly with RCEP members, and enhance economic cooperation between China and ASEAN (He and Yan, 2023). Dong and Bian describe the Hainan Free Trade Port as a significant pilot initiative in China's economic reform, aimed at

creating an open economy aligned with high-standard international economic and trade rules (Dong and Bian, 2024). Zang and Wang discuss the legislative practices of the Hainan Free Trade Port in recent years, pointing out that the legal and regulatory system of the port has taken initial shape at this stage (Zang and Wang, 2024).

Some scholars have also put forward development requirements for the Hainan Free Trade Port from a national strategic perspective. For example, Tang et al. believe that achieving regional collaboration between the Hainan Free Trade Port and the Guangdong-Hong Kong-Macao Greater Bay Area to create a strategic synergy and amplification effect is a pressing issue that needs to be addressed (Tang et al., 2024). Liu analyzes the origins of General Secretary Xi Jinping's series of discourses on the construction of China's distinctive free trade ports. And he also highlights his original positions and viewpoints (Liu, 2024).

Other scholars have conducted specific studies on arbitration, taxation, finance and foreign trade development related to the Hainan Free Trade Port (Wang and Huang, 2022; Wang, 2022; Li and Yuan, 2022; Li, 2025; Qin et al., 2025). However, dedicated research on international shipping policies within the context of pilot free trade zones or the Hainan Free Trade Port remains limited. These researches include those by Cao et al., who conducted a conceptual study on building dual domestic and international shipping cycles in China through an examination of policy innovations in high-level free trade agreements within free trade zones/free trade ports and the China Compendium (Cao et al., 2023). Shi is the first in China to comprehensively analyze innovative policies and systems in international shipping markets across pilot free trade zones, exploring issues such as the negative list for market access in international shipping and considerations on reforming the ship registration system (Shi, 2023; Shi, 2024a). Li believes that Hainan has reformed its shipping laws and policies to make them more open and free, implementing a more flexible, faster, and more convenient International Ship Registration (ISR) policy (Li, 2023).

### 2.2 International ship registration systems

Internationally, ship registration systems started in Norway. They adopted measures such as relaxing the nationality requirements for ship owners attracted foreign-owned ships to register in Norway, thereby addressing the issue of Norwegian ships relocating abroad. Over twenty other maritime nations and regions like Denmark, Germany, Singapore, and Sweden adopted the measures and foster the growth of the shipping industry (Yuan and Wang, 2022; Ye, 2023). Compared to other regions, international research on ship registration systems began relatively early, with foundational studies on definitions, registration requirements, and procedures. Notable figures in this field include John Marsell and Edward Watt (Mansell, 2009; Watt and Coles, 2009). In practical exploration, Perkins conducted a comprehensive comparative analysis between stringent and open ship registration systems (Perkins, 1997). In terms of system development, research reports by maritime law experts have

delted deeply into the fundamental patterns and trends of this system's evolution (UNCTAD, 2023; Duan et al., 2024). Thanopoulou reviewed the latest developments in ship registration and further emphasized the need for traditional maritime nations to make commercial and policy decisions within a different context in today's landscape (Thanopoulou, 1998). In addition, some scholars have analyzed the economic and policy effects of ship registration in South Korea (Park et al., 2022). Other scholars have analyzed the potential impact of institutional performance and the environment on ship registration (Mitroussi and Arghyrou, 2016). Some scholars have also analyzed ship registration issues from various perspectives, including the financial crisis, fraudulent registration, and the Red Sea crisis (Haider, 2013; Danill and Saviolakis, 2024; Xiang and Li, 2025; Aydin, 2024).

Doctrinally, the principle of flag-state jurisdiction is codified in the 1958 Convention on the High Seas (Art.5) and reinforced by tribunals. In the International Centre for Settlement of Investment Disputes (ICSID) award *Saint Vincent & the Grenadines v. Guinea (M/V Saiga No. 2)* in 1999, the tribunal held that only the flag state may enforce criminal and civil liability on board, and other states must defer to that exercise of jurisdiction. This reinforces why open registries like Singapore or Liberia succeed: they not only streamline registration but also offer clear enforcement regimes that owners trust. China's regulations could draw on these doctrinal insights to strengthen legal certainty for registrants.

Domestically, while the academic community in China has conducted relatively objective studies on this system, research outcomes have been limited and have developed at a slow pace. For a long period, studies primarily focused on the feasibility, necessity, and effectiveness of implementing this system in China. For instance, Chen et al. conducted a comprehensive assessment of the main content and implementation process of China's tax-exempt ship registration policy, analyzing its impact (Chen et al., 2017). In terms of the policy's effectiveness, some scholars argue that the pilot policy for international ship registration is overly framework-based, with limited visible effects (Wang et al., 2015; Huang and Chen, 2020). Regarding supporting measures, some scholars have proposed improvements from legal economics and tax reform perspectives (Yang, 2015).

## 2.3 Innovations on the international ship registration system of Hainan Free Trade Port

The development of the Hainan Free Trade Port needs new requirements for the establishment of the international ship registration system (Wang, 2023a). Regarding the specific practices of ship registration in Hainan Free Trade Port, a "one-stop service" information-sharing platform for international ship registration was launched in March 2024. Zhang and Xiao have noted that the development of this system is still in its early stages (Zhang and Xiao, 2021). Wei et al. have highlighted a concerning trend: an increasing number of Chinese-owned ships are registering

under Flags of Convenience (FOC) to avoid the strict regulations and high costs associated with Chinese registration. This trend disperses shipping resources and hinders the growth of China's shipping industry (Wei et al., 2023). Liu and Shen have emphasized the importance of establishing an efficient and convenient ship registration process in Hainan, similar to the model used in Hong Kong (Liu and Shen, 2021). Wang has pointed out several drawbacks in the current international ship registration regulations, such as a lack of clarity and regulatory gaps (Wang, 2023b). Additionally, some scholars have compared Hainan's registration system with those in other jurisdictions. Zhang has noted that ships registered in Hong Kong benefit from lower import duties and various tax exemptions (Zhang, 2010). Chen conducted a comparative analysis of ship registration practices in countries such as Norway and Japan (Chen, 2022).

In recent years, significant advancements have been made in maritime policy, technology, and international ship registration processes due to innovations in blockchain technology, electronic documents for international shipping, and ship registration systems. In terms of governance mechanisms in shipping, Ye suggests establishing a China-specific governance standard for international ship registration that leverages regional advantages and aligns with industrial strategies (Ye, 2023). In terms of institutional innovation, Xie points out that creating a more competitive environment through innovation can stimulate the growth of the regional shipping economy and drive broader regional economic development (Xie, 2017). Regarding ship regulatory oversight, He and Han believe that the regulatory model for ship registration still requires further optimization (He and Han, 2021). In terms of registration procedures, Tang notes that China has been exploring and innovating to simplify ship registration processes (Tang, 2023).

In summary, despite numerous researches conducted on international ship registration systems, studies still specifically focused on the international ship registration system within the context of Hainan Free Trade Port. This paper primarily adopts SWOT analysis, comparative analysis, and other research methods to conduct a comprehensive examination of the international ship registration system in the context of the Hainan Free Trade Port. The analysis is approached from both macro and micro perspectives, as well as through qualitative and quantitative lenses. It provides an objective evaluation of the current implementation of this innovative policy, complemented by a comparative review of relevant international practices. The study aims to offer targeted recommendations for the development and refinement of the system within the Hainan Free Trade Port, with the broader goal of enhancing China's international shipping competitiveness and promoting the sustainable growth of its national shipping industry.

## 3 Methodology

### 3.1 Principal research method

This paper mainly adopts three methods to explain the international ship registration system in the Hainan Free Trade

Port. It aims to conduct a thorough study over the dynamics of international ship registration and put forward potential policy improvements.

### 3.1.1 Theory of change model

According to the theory of change model adopted in the analysis, it is expected that after reaching such a high degree of registration efficiency, more vessels would be flying the national flag, attracting more foreign investments (Weiss and Connell, 1995). It also highlights needed pre-conditions necessary to actualize this effect. Considering there exists prevailing limitations, including bureaucratic hurdles and high fees, it offers targeted interventions aimed at making processes more straightforward and creating tax incentives among others as well (Rogers and Kelly, 2000). This model also provides a logical framework that connects the intervention with the expected outcome in such a way that the proposed changes can be evaluated (see Figure 1). The development of the ship registration system is influenced by both internal and external factors. Internal factors mainly include registration conditions, tax and fee standards, and the market environment, while external factors primarily involve financial and guarantee mechanisms, maritime legal frameworks and dispute resolution systems, and administrative procedures. Thus, the paper has used the theory of change model to enable the continuous assessment of the innovations of the system for any changes regarding effectiveness.

### 3.1.2 SWOT analysis

The SWOT analysis contains four elements: Strengths, Weaknesses, Opportunities, and Threats. The paper will create a strategic framework and identify how Hainan can leverage its strengths and opportunities while minimizing the presented

weaknesses and threats. The review will assist the development of practical strategies that may bring positive change in the international ship registration system at the Hainan Free Trade Port.

### 3.1.3 Comparative analysis approach

This paper adopts a comparative analysis approach in exploring at a comprehensive perspective of how the Hainan international ship registration system can learn from the best global practices in other jurisdictions to better adapt to the practical needs. This framework not only enhances the theoretical value of this paper but also adds some special values for concerning policymakers and stakeholders.

## 3.2 Case study and data source

This paper focuses on the Hainan Free Trade Port as the primary subject of study, conducting a detailed analysis of the international ship registration system and innovative policies within this context. Hainan was chosen as the research subject due to its favorable geographic advantages and unique policy benefits, which have driven innovations in areas such as maritime cargo transport, port entry and exit organization, and particularly in the ship registration system, supporting the development of the Hainan Free Trade Port.

This paper utilizes data officially published by the United Nations Conference on Trade and Development (UNCTAD), the Chinese government, and other countries to better address the challenges associated with implementing China's international ship registration innovation policies. The organization and analysis of these data provide strong support for evaluating the outcomes of China's innovative ship registration policies.

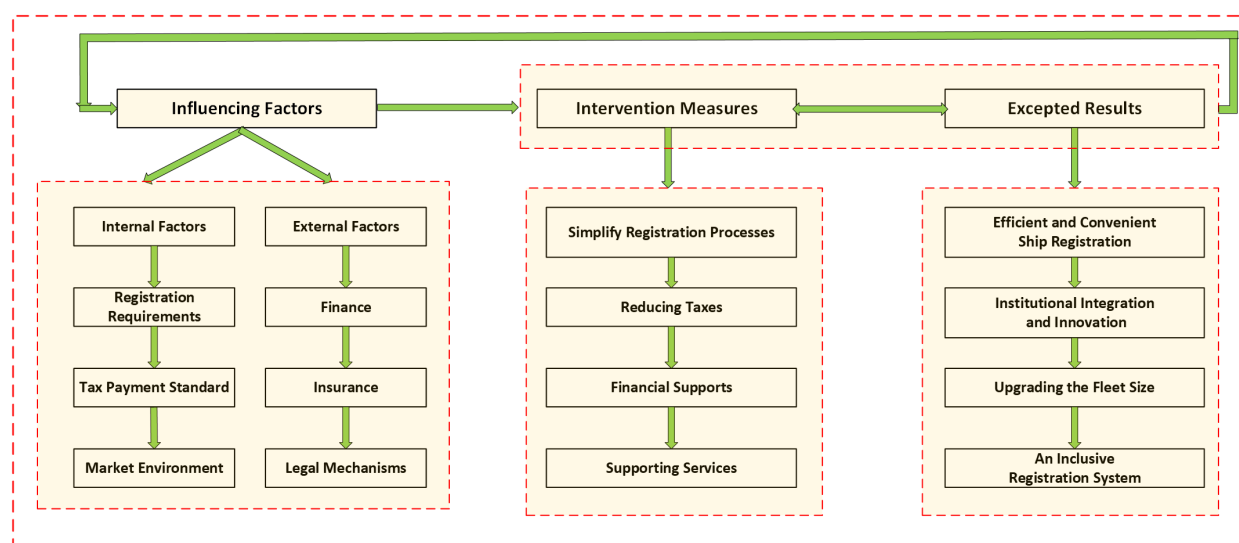


FIGURE 1

Theoretical change model of international ship registration system in Hainan Free Trade Port (source: authors' construct).

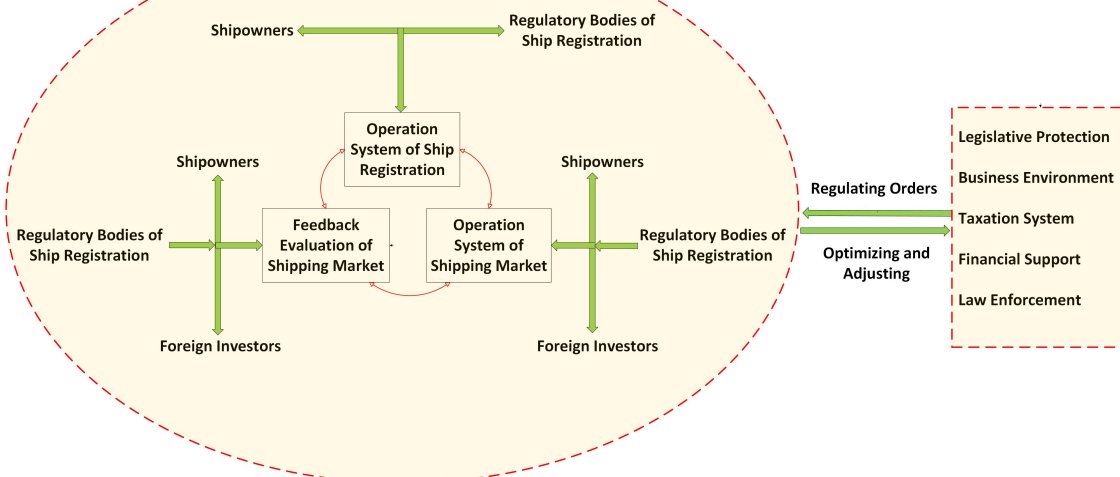


FIGURE 2

System dynamics model of the international ship registration in Hainan Free Trade Port (source: authors' construct).

### 3.3 Conceptual model for institutional innovation

The essence of institutional innovation is to create various conditions that facilitate international trade, thereby gaining institutional advantages and enhancing the ability to allocate market resources (Shi, 2024b). One of the most powerful conceptual frameworks to model and understand the dynamic behavior of complex systems is the system dynamics model, developed by Jay Forrester back in the 1960s (Sterman, 2000). With the systems dynamics model, the underlying complexity of the international ship registration system within the Free Trade Port of Hainan will be better comprehended.

This model provides a comprehensive description of the linkages and relations within the distinctive parts and valuable insights that could help policy makers in decision-making for the optimization of the registration process. It helps to illustrate the interactions among stakeholders such as ship owners, regulatory agencies, and foreign investors, as well as how legislative, tax, and enforcement reforms will impact the entire system (See Figure 2).

## 4 Current status of the international ship registration system in Hainan Free Trade Port

### 4.1 Evolution of the international ship registration system

Ship registration was originally a process in which shipowners applied to register their vessels with the registration authority in their own country to obtain national registry status (Zhang et al., 2009).

Later, some countries and regions, such as Panama, Liberia, and Hong Kong, introduced a series of policies—such as streamlined registration procedures and tax incentives—to attract shipowners to register their vessels locally, leading to what became known as “flags of convenience”. Within the framework of Hainan Free Trade Port development, international ship registration refers to the registration of vessels under the “Yangpu Port, China” registry for ships operating exclusively on international routes, including those to Hong Kong, Macau, and Taiwan.<sup>1</sup>

UNCTAD's Review of Maritime Transport 2024 report, global trends and structures in ship registration continue to shift. The report states that as of January 2024, the total deadweight tonnage of the global merchant fleet is approximately 2.1 billion tons, with 75.5% registered under flags of convenience. This represents an increase of 0.8% in the proportion of tonnage under flags of convenience compared to 2023. The top ten flag states control about 70% of the global deadweight tonnage, with Panama, Liberia, the Marshall Islands, Hong Kong, and Singapore holding the largest shares, accounting for over 50% combined (UNCTAD, 2024a). The rising proportion of flags of convenience has led the Chinese government to explore policies to encourage ships to register in China to expand the nation's fleet tonnage and enhance control over shipping resources (Yin et al., 2018).

This report also notes continuous growth in ship registration in Asia, with China, Singapore, and Hong Kong increasing their share of the global registration market year by year. As of 2024, China's registered fleet tonnage ranks within the global top ten, with particularly notable gains in the bulk carrier and tanker markets. Meanwhile, the decline of the share of traditional ship-owning countries in Europe and the Americas reflects a trend where more

<sup>1</sup> Article 3 of Provisions on International Ship Registration Procedures of Hainan Free Trade Port.



TABLE 1 Innovation policy of international ship registration in Hainan Free Trade Port.

Date	The subject of promulgation document	Name of promulgation document	Specific content
March 19, 2014	The People's Government of Hainan Province	Implementation Opinions on Promoting the Construction of Shipping Hub and Logistics Center in Southeast Asia	Strive to attract a batch of Chinese-owned ships to transfer their registration to Hainan; strive to designate the Yangpu Free Trade Port Zone or Sansha City as a pilot for the innovation of the international ship registration system.
December 1, 2015	The People's Government of Hainan Province	Notice on the Implementation Plan for the Development of Modern Logistics Industry in Hainan during the 13th Five-Year Plan	Make full use of the existing tax incentives for Chinese-owned “convenience flag” ships to promote the registration of eligible vessels in Hainan.
April 11, 2018	The State Council	Guiding Opinions of the Central Committee of the Communist Party of China and the State Council on Supporting Hainan in Fully Deepening Reform and Opening Up	Study and explore the establishment of a more open international ship registration system in Hainan Free Trade Port.
April 11, 2018	The State Council	Overall Plan for the Construction of Hainan Free Trade Port	The goal is to “use ‘China Yangpu Port’ as the port of registry, simplify inspection processes, gradually relax mandatory ship inspections, establish the Hainan Free Trade Port International Ship Registration Center, and innovate to establish convenient and efficient ship registration procedures.
November 3, 2020	Hainan maritime safety administration	Regulations on the International Ship Registration Procedures of Hainan Free Trade Port	Compared with the relevant procedural regulations for domestic ship registration, the innovation in these regulations is relatively limited.
June 1, 2021	Hainan Provincial People's Congress	Hainan Free Trade Port International Ship Regulations	The first document specifically addressing the procedural regulations of the international ship registration system.
June 10, 2021	Hainan Provincial People's Congress	Law of the People's Republic of China on Hainan Free Trade Port	Grant Hainan Free Trade Port greater local legislative autonomy.
May 11, 2022	The State Council	Approval for Temporarily Adjusting the Implementation of Relevant Provisions of the Ship Registration Regulations of the People's Republic of China' in Hainan Free Trade Port	For ships registered in Hainan Free Trade Port that only operate within the port, the foreign equity ratio restriction for the ship registration entity is waived.
March 4, 2024	Ministry of Transport	Ship Registration Work Procedures	Promote and improve the ship registration system.

(Source: Authors' construct).

shipowners register vessels in countries with favorable tax and regulatory conditions offered by flags of convenience (UNCTAD, 2024b).

In China, the government's exploration of the international ship registration system began in 2007 and has generally followed a three-stage progression: special tax-exempt registration policies, bonded port ship registration, and then ship registration in pilot free trade zones. However, the actual outcomes have been limited, and there have been no substantial breakthroughs in innovating the international ship registration system (Chen et al., 2017). The main reasons lie in China's significant gaps compared to global high-standard international ship registration centers, particularly in business environment, ship financing, and registration regulations. High taxation, in particular, has limited the effectiveness of international ship registration. Since the establishment of the Shanghai Pilot Free Trade Zone in 2013, China has accelerated its efforts to develop and innovate this system.

## 4.2 Process of ship registration system innovation in Hainan Free Trade Port

Since 2014, Hainan has begun piloting innovative policies for the international ship registration. In June 2020, the State Council

officially issued the “Overall Plan for the Construction of Hainan Free Trade Port”, which proposed to “use ‘Yangpu Port, China’ as the ship registry port, simplify inspection procedures, gradually relax statutory ship inspections, establish an international ship registration center in Hainan Free Trade Port, and innovate the establishment of convenient and efficient ship registration procedures.” This indicates that the construction of the international ship registration system will gradually be an important part of Hainan's Free Trade Port development. The specific policies are outlined in Table 1.

## 4.3 Impact of innovation in the international ship registration system

### 4.3.1 Qualitative impact

Against the background of the construction of Hainan Free Trade Port, the development of the international ship registration system has been continuously improved. First, the gap is continuously narrowing. China's international ship registration system has surpassed its traditional system to this end with the construction of the Hainan Free Trade Port. It also explored more in the conditions of international ship registration and made some progress (He and Han, 2021). Compared with the more mature systems for the registration of

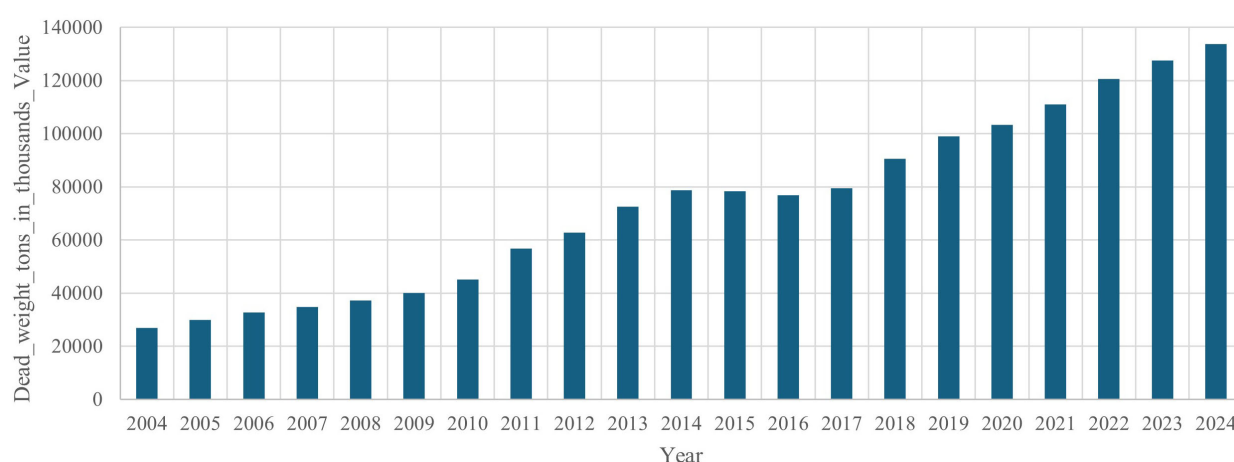


FIGURE 3

Changes in the scale of China-registered ships from 2004 to 2024 (in Deadweight Tonnage)(Authors' calculations based on UNCTAD Data Hub data).

international ships in Hong Kong, and Singapore, the international service provided by the Chinese Mainland's ship registration system is inadequate, and the corresponding measures to support it have not been fully implemented (Peng et al., 2023). Given the construction of the Hainan Free Trade Port, it is necessary to continue to promote improvements and innovation in the international ship registration system. Second, China seeks to offset the limitations of its strict traditional ship registration system. The major provisions of this system at present are mainly embodied in the Regulations on Ship Registration. These regulations have certain issues, including complicated conditions and procedures for registration, and heavy taxes and fees. As an important platform for China's new round of transformation and upgrade of its industrial structure, the Hainan Free Trade Port has pioneering significance in many respects. Its construction has prompted a series of policies relating to enhancing the efficiency of governmental administration and the facilitation of trade, and has led to more stringent requirements for the international ship registration system. The original system is cumbersome such that it cannot satisfy the conditions for the smooth operation of the Hainan Free Trade Port. The convenience, efficiency, and openness of this port have promoted the reform of the international ship registration system in China as well.

#### 4.3.2 Quantitative impact

The innovative development of the ship registration system aligns with the overall direction of national strategic development. China has always been exploring innovations in the international ship registration system. We can observe that over the past 20 years, China's registered ship deadweight tonnage has shown a steady increase, supported by a stable domestic development environment and external demand for maritime transport (see Figure 3).

Since 2014, when the Shanghai Free Trade Zone and Hainan Free Trade Port began piloting innovative international ship registration policies, the scale of China-registered ships has changed significantly (see Figure 4). It is not possible to compare the trends in gross tonnage and number of registered vessels over the ten years before and after 2014 because of some missing data.

However, the chart of registered deadweight tonnage alone shows a consistent growth trend on both sides of 2014, from which we obtained two similar linear regression models, as shown below:

$$\text{Before 2014: } y = 5201.9x - e^7$$

$$\text{After 2014: } y = 6160.5x - e^7$$

It is apparent that the growth trend in the latter decade is somewhat faster, with a slight increase above the trendline observed even during the pandemic. This suggests that China's relevant policies and regulations have had a stimulating effect on the growth of registered ship net tonnage. The series of ship registration systems and innovative policies implemented have had a positive impact on China's international shipping market.

## 5 Evaluation of the implementation of international ship registration innovation policies at Hainan Free Trade Port

### 5.1 SWOT analysis of innovative international ship registration system

The SWOT analysis of the innovative international ship registration system for the Hainan Free Trade Port highlights its strategic location, supportive policies, and systematic registration services as key strengths. Current challenges include limited awareness, a shortage of skilled professionals, and vague registration standards. Plus, opportunities arise from the increasing demand for efficient, low-cost registration services, and the potential to learn from successful models in Hong Kong and Singapore. However, the system is challenged by other established registration centers and uncertainties from potential domestic policy changes as well. Strategies include leveraging Hainan's advantages to attract

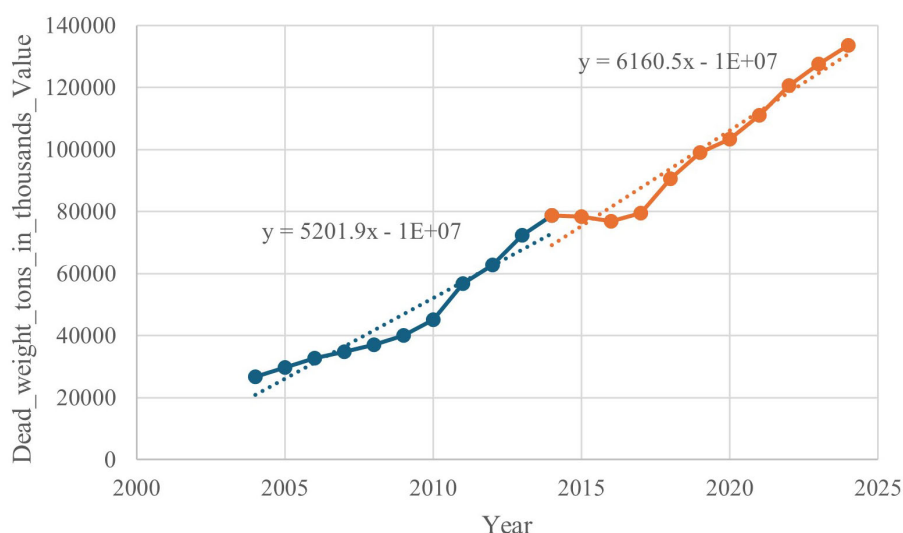


FIGURE 4

Comparative trend of China-registered ship scale over the decade before and after 2014 (in Deadweight Tonnage)(Authors' calculations based on UNCTAD Data Hub data).

international shipowners, enhancing market promotion and expertise through collaborations, fostering partnerships with the International Maritime Organization (IMO), and implementing risk management and improving management structures to ensure the efficiency of the whole system (see Table 2).

### 5.1.1 Maximize existing strengths

- Hainan is not only the international trade and shipping hub in the South China Sea area, but also an important gateway to the sea routes facing Southeast Asian countries. Plus, it is also an important maritime transportation spot of the “Belt and Road initiative” framework.
- Hainan has its own policy privileges as free trade port. Overall Plan for the Construction of Hainan Free Trade Port has further clarify the position and construction requirements of Hainan Free Trade Port with the goal of building a free trade port with Chinese characteristics that is open to the world. It mentioned that it is necessary to promote the construction of international shipping hubs and aviation hubs, accelerate the construction of a modern comprehensive transportation system, and confirm “China Yangpu Port” as the port of registry.

### 5.1.2 Tackle weaknesses

- The maritime department needs to further transform its functions, continuously improve regulatory standard, and gradually establish a set of maritime rules to better promote the construction of Hainan Free Trade Port.
- The construction of digital administration service is still immature. “Single Window” can provide one-stop services for administrative agencies and all import and export business-related enterprises, which can largely shorten the

time. However, compared with other developed free trade ports, there's still room for improvement.

- At present, there is a relative shortage of high-quality talents who are expert in shipping.

### 5.1.3 Seize opportunities

- The international community is gradually paying more and more attention to environmental protection and sustainable shipping. Hainan Free Trade Port can make full use of the policy support to promote the development of clean energy shipping and the establishment of green ship registration standards, which can serve to attract international shipowners who pursue environmental-friendly operations.
- Hainan's different industries like shipping, finance, insurance, legal service and other supporting service industries will also be promoted to form a more complete industrial chain with the developing ship registration system. This synergy effect will further enhance the attractiveness of Hainan Free Trade Port, reduce operating costs and improve operational efficiency.

### 5.1.4 Mitigate threats

- The international shipping industry is highly dependent on changes in the international economic and trade environment. The demand for shipping can be negatively affected by potential economic downturn, trade friction or political crisis. Reducing the potential risk exposed to the unstable geopolitics is important for policy makers to take into consideration.
- The ship registration system in Hainan's free trade port is also affected by fluctuations in the global supply chain, such



TABLE 2 SWOT analysis of international ship registration innovation policies<sup>1</sup>.

Internal Strengths & Weaknesses External Factors	Strengths(S)	Weaknesses(W)
	1. Excellent geographical position 2. Policy Support 3. Systematic ship registration service	1. Lack of awareness 2. Lack of expert talents 3. Vague registration standards and procedures
Opportunities(O)	SO	WO
1. An increasing demand for efficient and low-cost ship registration services 2. Ship registration restrictions gradually eased 3. Existing successful experiences of Hong Kong and Singapore to learn from	1. Promote the geographical advantages of Hainan Free Trade Port and, attract more international shipowners to register. 2. Utilize efficient registration services to shorten ship registration time 3. Provide one-stop service and reduce complex formality requirements	1. Strengthen the market promotion 2. Cultivate expert talents with the cooperation with universities and industrial associations 3. Clarify the requirements for ship registration and monitoring process
Threats(T)	ST	WT
1. Too many competitive international ship registration centers 2. Uncertainty caused by the change of domestic policy	1. Strengthen the cooperation with International Maritime Organization (IMO) 2. Draft emergency plans and ensure the continuity of the registration services 3. Reform the process of registration and improve the efficiency	1. Develop the risk management scheme 2. Optimize the management structure and clarify the responsibilities of each department 3. Improve the quality of ship inspections

(Source: Authors' construct).

<sup>1</sup>SO stands for combining strengths and opportunities; ST stands for combining strengths and threats; WO stands for combining weaknesses and opportunities; WT stands for weaknesses and threats.

as shortages in the supply of bunker fuel and increases in the price of shipping equipment. If the supply chain is unstable, it may lead to higher costs for shipowners after registration in Hainan. It will further affect their operational efficiency and profit margins and even reduce Hainan's competitiveness.

## 5.2 A global comparison of international ship registration systems

The Comparison of ship registration systems in typical shipping countries and regions is as follows:

The first category includes the commercial ship registration system of Panama and Liberia. Panama's ship registration framework, administered by the Panama Maritime Authority (PMA) under the Panama Merchant Marine Law, permits foreign ownership of vessels with minimal restrictions. The system allows dual registration and provides tax exemptions for shipping-related income. To enhance fleet quality, the PMA has removed over 200 non-compliant vessels since 2021. In contrast, Liberia's registration regime under the Liberian Maritime Act (1990) requires non-Liberian entities to obtain a waiver for ship registration. However, Liberia facilitates efficiency through round-the-clock electronic mortgage registration services and tax exemptions for non-resident entities under Section 804(b) of its Revenue Code.

The second category of the international ship registration system is prevalent in Japan, Norway, and Denmark. Denmark's ship registration system operates through three tiers: the Register of Shipping, the Danish International Register, and the Boat Register. The Danish International Register mandates a "genuine connection" to Denmark, typically demonstrated through economic activities in the country, alongside an annual fee. Foreign vessel owners must adhere to stringent documentation requirements, such as submitting notarized powers of attorney. In

contrast, Norway's regulatory framework aligns with broader EU standards, including compliance with Paris Memorandum of Understanding inspection protocols, and is presumed to enforce ownership transparency measures similar to Denmark's. Meanwhile, Japan maintains a closed registry system under its Ship Act, prioritizing national ownership by requiring that vessels be majority-owned by Japanese citizens or domestically incorporated companies.

The third category consists of the cooperative ship registration system that is enforced in Britain and France, which are also traditional shipping powers. The UK Ship Register, established under Part 2 of the Merchant Shipping Act 1995, limits registration to British citizens, European Economic Area (EEA) nationals, or corporations with a registered presence in the UK. While dual registration is prohibited, the system permits bareboat charters under Part 4 for vessels flagged in approved jurisdictions, such as commonwealth member states. In France, the French International Register, governed by the Customs Code, allows EU/EEA-owned vessels to register but excludes Swiss-owned ships and restricts cabotage (domestic coastal trade) to EU waters. Non-EU companies operating under the French International Register must appoint French managers and ensure vessels undergo reclassification by approved organizations, including Bureau Veritas.

The fourth category of the international ship registration system is the service ship registration system in place in Singapore, China, and Hong Kong. Hong Kong has no restriction on the age and tonnage of registered ships but requires only that more than half of their rights and interests be owned by one or more "qualified" person under the Hong Kong Merchant Shipping (Registration) Ordinance, which does not impose age or tonnage limits on registrable ships. That is, the ship should belong to a local person or a locally registered company, and a resident of Hong Kong must be appointed as the shipowner's representative. Singapore has no restriction on registered ships, except that they cannot be older than 17 years. The owner of the ship is required to be a Singapore

national or a corporate legal representative who has established a company in Singapore. Ships owned by foreign-funded companies may be exempt from this requirement.<sup>2</sup>

According to Figures 5–7, Liberia and Panama continue to dominate global ship registrations between 2020 and 2024, reflecting their established status as major centers for flags of convenience registration. China and Hong Kong SAR also grew sharply in deadweight and gross tonnage, indicating a significant increase in China's maritime capabilities in support of its Belt and Road Initiative and international trade framework. Singapore remains an established shipping country with continued growth in competitiveness, while European countries generally perform at a stable but low level in terms of registered tonnage and number of ships.

## 5.3 Issues in the innovative development of the international ship registration system

### 5.3.1 Imperfect supporting policies for the international ship registration system

China's international ship registration system remains hindered by misaligned financial and tax policies that lag procedural reforms. High financing costs and fragmented tax incentives dissuade shipowners from registering vessels under the Chinese flag. Transforming Hainan into a competitive maritime registry requires synchronized financial and regulatory upgrades. A critical step would involve replacing variable corporate taxes with a tonnage-based tax system, where fees are calculated based on a vessel's cargo capacity, reducing costs and stabilizing expenses for operators. Parallel to this, creating a specialized maritime financing program at the China Development Bank—offering low-interest loans and guarantees tailored for Chinese-flagged ships—could mirror Singapore's effective model. Simultaneously, establishing a one-stop service center in Hainan to consolidate registration, tax processing, port coordination, and legal support would streamline administrative processes and reduce delays. Crucially, these reforms must be implemented as a cohesive package rather than isolated measures. By harmonizing fiscal, financial, and bureaucratic frameworks, China could incentivize shipowners to repatriate fleets currently under foreign registries and strengthen its position in global shipping markets.

### 5.3.2 Weaknesses in supervision of the international ship registration

At present, China's international ship registration is still “weak supervision”<sup>3</sup>. Under the international ship registration system of the Hainan Free Trade Port, foreign-funded international vessels

are no longer subject to quota-based restrictions. However, if attracting foreign investment is prioritized at the expense of reasonable supervision—particularly concerning the qualifications for naturalization of registered entities—the system's smooth and secure operation may be compromised. At present, China's regulatory mechanisms for international ship registration remains underdeveloped. The safety oversight of naturalized international vessels remains insufficient, and enforcement measures related to ship registration lack robust legal and institutional support, particularly in terms of a stable and long-term regulatory framework. Moreover, daily administrative oversight by relevant maritime departments remains weak. The division of responsibilities among market supervision authorities, ship registration agencies, and tax departments is still not perfect. Although the entry threshold for foreign-invested shipping companies has been lowered with the development of the Hainan Free Trade Port, it is essential for the relevant departments to implement stronger regulatory measures. This will ensure the safety and integrity of China's international shipping operations.

### 5.3.3 Imperfect mechanism of judicial assistance for the international ship registration system

Driven by the aim of becoming a maritime and shipping power, China has established a comprehensive mechanism of dispute resolution so that most maritime disputes can be satisfactorily resolved. However, it struggles with cases involving international ship registration. The mechanism of handling such maritime disputes is still inadequate. In addition, China does not have a settled mechanism of judicial assistance with ASEAN countries and countries along the Belt and Road. Because international ship registration is susceptible to disputes regarding the “nationality” of ships, it is important to strengthen international judicial assistance to enable the resolution of disputes involving foreign maritime vessels, and uniform jurisdiction.

## 6 Suggestions for improving China's international ship registration system in the context of the Hainan Free Trade Port construction

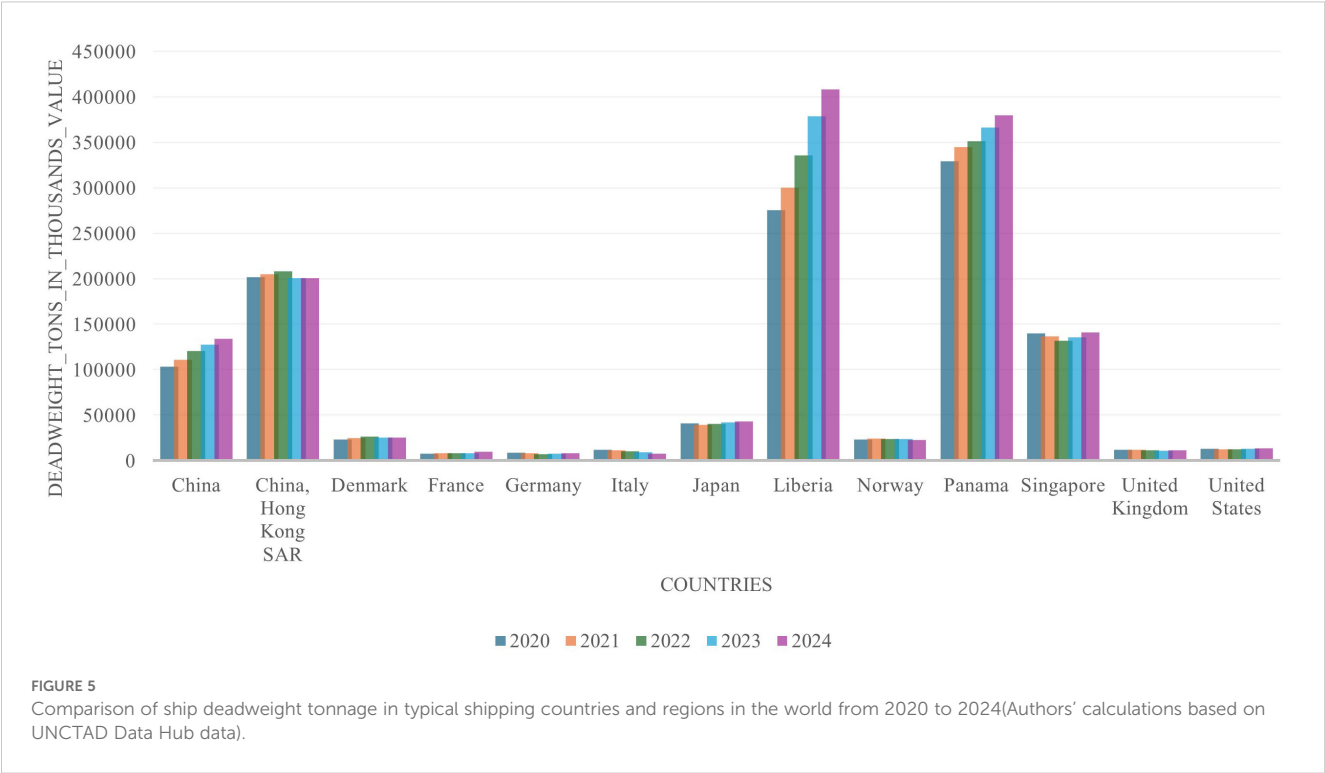
### 6.1 Improvements in international ship registration system at the legal system level

#### 6.1.1 Legislative level

To further enhance its international ship registration system, China should establish an innovative and comprehensive framework of supporting laws and regulations. First, at the national legislative level, the National People's Congress Standing Committee could consider amending fundamental legislation such as the Maritime Law to add a dedicated chapter on ship registration. This chapter could consolidate core provisions on vessel ownership, mortgages, and bareboat charters, while clarifying the legal

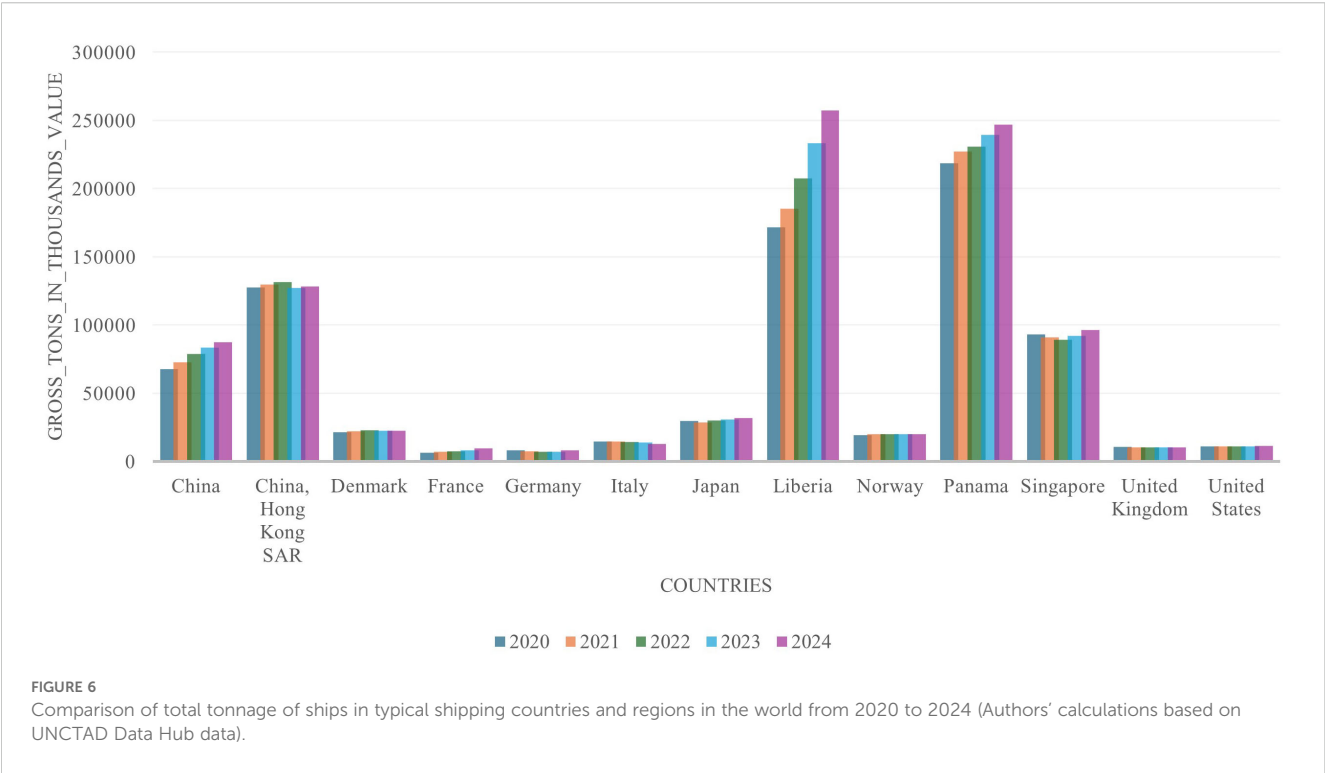
<sup>2</sup> Report of Shanghai International Shipping Research Center in 2020 for details.

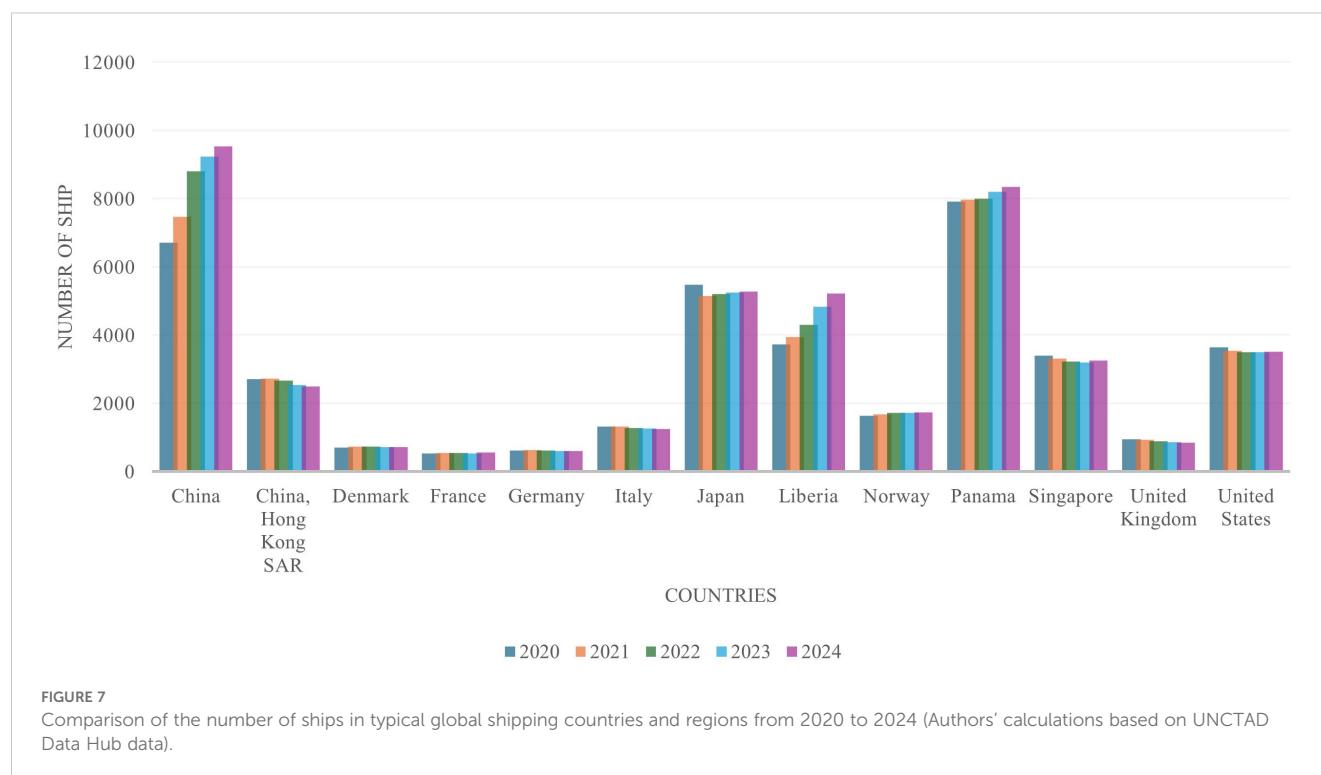
<sup>3</sup> In legal context, “weak supervision” refers to inadequate oversight by authorities, institutions, or individuals responsible for monitoring compliance, enforcing regulations, or managing risks.



implications of registration and its relationship with changes in property rights. Second, Ministries and Commissions under the State Council—such as the Ministry of Transport—should develop and implement a more open international ship registration system, along with specific administrative regulations tailored to China’s national conditions. Furthermore, local maritime authorities should

issue detailed implementing rules to support higher-level legislation. These should optimize registration procedures based on the specific circumstances of local ports and may include the adoption of local regulations or normative documents—such as the electronic government platform used in Macao—to streamline documentation and submission processes.





In conjunction with the pilot work at this stage, we propose improving the Regulations on Ship Registration and related policies. The government needs to optimize regulations on inquiries for ship registration, and enhance the mechanism of information sharing between China and other countries.

### 6.1.2 Judicial level

In the context of the construction of the Hainan Free Trade Port, China needs to strengthen the cooperation between international ship registration agencies and judicial bodies to promote innovations in the system. First, the government needs to strengthen the mechanism for handling cases of international ship registration. The relevant agencies need to cooperate with each other as well as the courts when handling disputes involving ship registration. Second, China needs to establish a data sharing system for ship registration. Big data and information technology can be used to share the relevant maritime information across countries and regions, as this will help more efficiently solve disputes concerning the registration of international ships. Third, China needs to engage in judicial cooperation with its neighbors. This may involve a legal system of ship registration between countries that may otherwise have different approaches to dispute resolution. China should make full use of its regional advantages to broaden its horizons, and to enhance judicial linkage as well as mutual trust and cooperation between countries.

### 6.1.3 law enforcement level

Against the background of the construction of the Hainan Free Trade Port, China's international ship registration system should also be improved at the level of enforcement. On the one hand, the government needs to continue to improve the law enforcement-related procedures for international ship registration. China should formulate a reasonable

system to review it, simplify the registration process, and improve its efficiency by combining the formal and substantive reviews of registration. On the other hand, the government needs to implement the supervision and management of international ship registration. An effective multi-supervision mechanism should be established to ensure smooth operation. Moreover, it is necessary to strengthen safety-related supervisions for the naturalization of international ships, standardize the mode of supervising ship registration, attach importance to cross-regional and inter-departmental supervision, ensure the safe operation of international ships, and maintain order in the international shipping market.

## 6.2 Improvements to the international ship registration system at specific policy levels

### 6.2.1 Continued reform of the tax system for shipping enterprises

Maritime departments should simplify the procedures for the registration of international ships, optimize their registration and related business processes, and provide convenient and efficient services for their operation, financing, insurance, repair, and trading. International shipping enterprises in China are burdened by different kinds of levies and taxes in their home countries that are generally higher than average international level. They include the tonnage tax, personal income tax of the crew, corporate income tax, business tax, and value-added tax. We suggest that in line with international standards, China should appropriately reduce the tax on local shipping enterprises. The government and the relevant departments should consider reforms to the system of finance and taxation, and provide greater tax incentives to key shipping enterprises.

## 6.2.2 Development of shipping service system

China should seek to develop a service system for shipping support. On the one hand, it is necessary to develop a new mode of shipping supervision, establish a working mechanism that is jointly handled by the supervision, taxation, finance, and other relevant departments, and improve the overall efficiency of the system. On the other hand, China needs to improve the construction of green and smart ports for the shipping industry. The government needs to strengthen the construction of ports and waterways and enhance the service capacity of shipping. International experience has shown that the reform of the system of registering international ships depends on the support provided by “package” policy systems, including those of registration, supervision, taxation, finance, and law (Su, 2020). Such reforms should integrate innovations in port and ship management, maritime affairs, and taxation and finance to mitigate bottlenecks in the development of the international shipping registration system. This can strengthen the “soft power”<sup>4</sup> of China’s shipping industry.

## 6.2.3 Establish and improve the ship registration supervision mechanism

At present, the regulatory measures for the international ship registration system in Hainan Free Trade Port are overly framework-based, with limited practical applicability. According to relevant IMO documents, each flag state should establish an “appropriate and effective” system to diligently fulfill international obligations under maritime law and take on corresponding regulatory responsibilities to further safeguard maritime safety (Yuan and Wang, 2022). The innovative development of the international ship registration system in the context of Hainan Free Trade Port construction is not merely a matter of simple registration but also involves ensuring that regulatory measures for national ships are implemented in a timely manner. This requires China to establish unified standards for data collection, organization, preservation, and retrieval when registering national ships, and to strengthen interconnectivity among market entities across various departments. Additionally, a diversified and collaborative regulatory mechanism involving multiple stakeholders is essential. Overall, the continuous construction and improvement of the regulatory system for China’s international ship registration system will facilitate its innovation and reform.

## 7 Conclusion

The development of China’s Hainan Free Trade Port brings new momentum and opportunities to the country’s economic growth. It is important to innovate its international ship registration system to encourage China-funded flag ships which are currently sailing under flags of convenience to return and enhance the country’s strength in international shipping. This paper conducts an in-depth

study of the international ship registration system in the context of the Hainan Free Trade Port’s development from both qualitative and quantitative, as well as macro and micro perspectives, leading to the following conclusions:

- (1) The Hainan Free Trade Port is pioneering an innovative approach to its international ship registration system, striving to build a framework that meets the highest global standards. The primary objective is to attract a substantial number of China-funded flag ships and foreign-owned ships to register under “China Yangpu Port”. By doing so, it aims to consolidate shipping resources, foster the growth of Hainan’s high-end maritime service industry, and facilitate the gradual liberalization of the shipping market.
- (2) International ship registration is not merely about ship inspection and registration; it is also closely linked to a range of modern maritime services, including taxation, financing, and legal services. The leading industries of the Hainan Free Trade Port, such as tourism, modern services, and high-tech industries, are closely connected to the shipping services involved in the innovative development of international ship registration. Therefore, it is essential to enhance the integration and innovation of the ship registration system within the context of the Hainan Free Trade Port’s development.
- (3) In the development of the international ship registration system in the Hainan Free Trade Port, emphasis must also be placed on ensuring safety and quality. The advancement of international ship registration should strive for high-quality development, aligning with the highest international standards. Therefore, maintaining ship quality throughout the registration process and establishing a strong reputation as a flag state are of paramount importance.

In conclusion, China’s international ship registration system has entered a new stage in its evolution with the construction of the Hainan Free Trade Port. We need to carefully assess this system to avoid redundant implementation practices and ensure its smooth operation. Such a system is crucial for fostering the sustainable growth of China’s international shipping industry.

## Data availability statement

The original contributions presented in the study are included in the article/supplementary material. Further inquiries can be directed to the corresponding author.

## Author contributions

YHS: Funding acquisition, Writing – original draft, Writing – review & editing. YJS: Methodology, Visualization, Writing – original draft. HZ: Data curation, Formal analysis, Writing – original draft.

<sup>4</sup> “Soft power” refers to the strategic use of legal frameworks, diplomatic engagements, and cultural or educational guidance to achieve policy objectives rather than coercion or economic interruption.



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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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