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Xinhua-Baltic
International Shipping Centre Development Index report
2019

Xinhua-Baltic
International Shipping Centre Development Index
(2019)

China Economic Information Service
The Baltic Exchange
July 2019

Editorial Committee

Acknowledgement (In alphabetical order)

This index research has received great support and enthusiastic help from several professionals in the shipping industries around the world. Their insights allow us to gain in-depth and multi-faceted knowledge of the natural orders of shipping centres, as well as understanding of the many aspects of global shipping development. Their input has played a crucial role in forming the viewpoints of this report.

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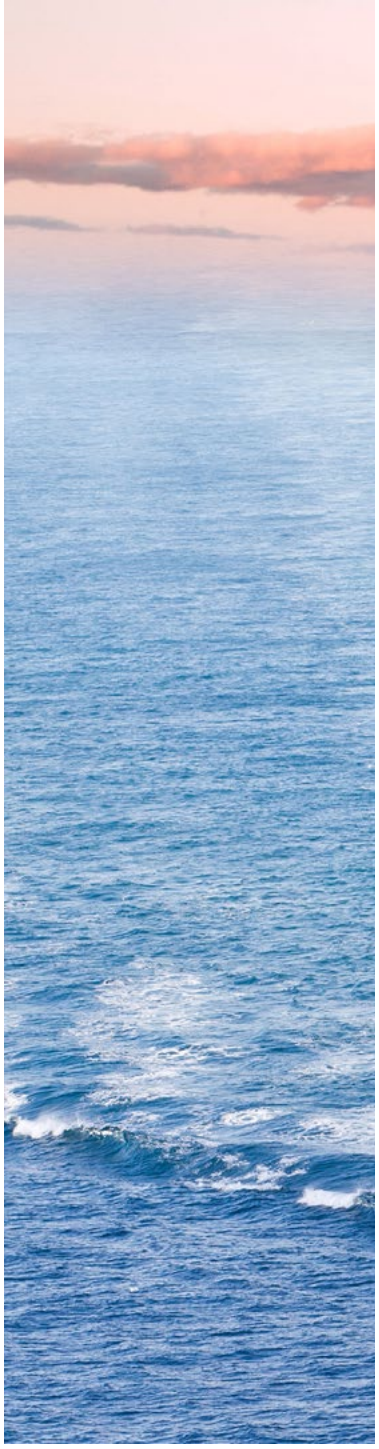
Preface



An international shipping centre is an important port city with a range of key characteristics. These include excellent port facilities, advanced logistics systems and a key geopolitical location; it also has highly efficient shipping services as its core driver, as well as global shipping resources.

In 2014, China Economic Information Services, in collaboration with the Baltic Exchange, introduced the first "Xinhua-Baltic International Shipping Centre Development Index" to the industry. Since its inception six years ago, it has been gaining international influence.

Impacted by a changing political and economic landscape, the international shipping industry has been undergoing subtle changes in the last couple of years. Emerging business models, such as intelligent ports, green ports and port district integration, will bring new influences to the development of shipping centres globally.

Under scrutiny from industry experts around the world, the research team has taken into account feedback from the global community over the years to further improve the model and index hierarchy. This year's report includes deeper regional research and offers a summary of the development characteristics of major shipping routes and regions. It also explores topics such as bay area economy, intelligent ports, the Polar Silk Road, and green shipping concepts.

In addition to data, the editorial team has also conducted an in-depth quantitative analysis of the development of international shipping centres globally to bring new perspectives to traditional concepts. We hope the evaluation results offer additional insight that is objective and impartial.

There will inevitably be inadequacies in this research report, but we constantly strive to update and improve it. As such, we value and appreciate our readers' comments and feedback. Our Comprehensive Environmental Index aims to reflect, as accurately as possible, the differences in the comprehensive environment amongst domestic shipping cities within a large country. Due to the importance of the development of land transport logistics in the construction of an international shipping centre, this report places greater emphasis on land logistics of shipping centres. We continuously strive to gather the most up-to-date data and information that is reliable and insightful.

We welcome and encourage other ports to join us in a collaborative effort to explore how we can further develop international shipping centres. A collective industry effort is required to help promote a rational allocation of global shipping resources, enhance the movement of global commodities and support the scientific development of international shipping centres.

Editorial Board,

Xinhua-Baltic International Shipping Centre Development Index

July 2019

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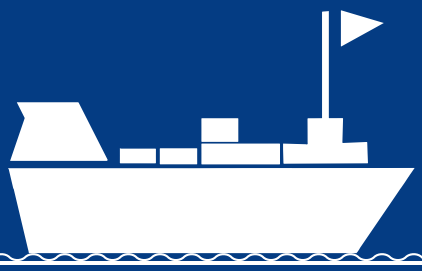
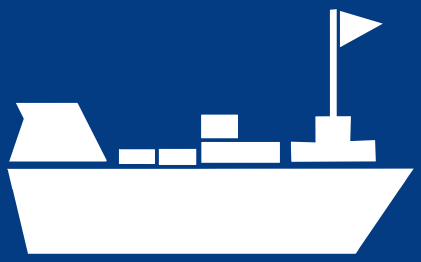


Xinhua-Baltic International Shipping Centre Development Index

Chapter 1

New Understanding in Global Shipping

1. New Challenges in the World Economy
2.New Trends in Global Shipping



1. New Challenges in the World Economy

Global economic growth may slow down in 2019. In its "World Economic Outlook" released in April 2019, the International Monetary Fund (IMF) pointed out that the global economy grew at 3.6% in 2018 and is expected to decline further to 3.3% in 2019, with 70% of the global economies experiencing slower growth.

The baseline outlook for emerging Asian economies continues to improve. With the announcement of US trade measures, the IMF lowered its forecast for US GDP growth for 2019. Meanwhile, growth forecasts for Europe and Japan have also been lowered. However, economic growth of the emerging markets and developing economies is more stable at a level just shy of 5%. These will be the main driving forces of global economic growth, but there are differences even amongst these regions and countries. The baseline outlook for emerging Asian economies continues to improve. China's growth is expected to slow gradually to a sustainable rate, with leading economies converging towards a higher income level. The main drivers of global GDP growth in 2019 will be the growth of China and India and their relative weights in global income.

As for the other regions, the outlook has become complicated. Their growths are affected by various factors such as structural bottleneck, slower growth of developed economies, high debt incurred by some countries and financial tightening measures. These factors, taken together with the pressure on commodity prices and civil wars in some countries, have led to sluggish mid-term outlook for Latin America, the Middle East, North Africa, Pakistan and sub-Saharan Africa regions. In particular, the prospect of convergence of the 41 emerging markets and developing countries towards developed economies is bleak. In terms of purchasing power, the above countries, with a total population of close to one billion, accounts for only about 10% of global GDP. Their per capita income is expected to lag further in the coming five years, as compared with developed economies.

2. New Trends in Global Shipping

Growing demand for clean energy; strong performance in LNG transportation

The Liquified Natural Gas (LNG) transportation sector performed strongly in 2018. The steadily increasing number of shipments has supported increasing shipping rates; new ship orders also reached an all-time high in the same year. LNG production and trade have been gaining momentum in recent years and is slated to be the new hot spot in the global oil and gas industry. To ensure diversification of energy supply and improve structure of energy consumption, some countries with high energy consumption have begun to introduce LNG as an alternative energy source. China, Japan, South Korea, the United States and countries in Europe are building large-scale LNG terminals. Large international oil companies are also beginning to develop new revenue streams from the LNG business. LNG is becoming another hot energy commodity after oil. At a time when container, dry bulk and tanker shipping are in the doldrums, strong performance by LNG shipping undoubtedly provided a shot in the arm for the global shipping market.

Strengthening environmental protection: Impending implementation of Global Sulphur Cap

From 1 January 2020, the IMO rule mandates that except for the four major emission control regions including the Baltic Sea, the North Sea, North America and the Caribbean Sea, ships in all other marine regions shall only use fuel with sulphur content no higher than 0.5%m/m (Current standard is no higher than 3.5%m/m. From 1 January 2015, the four major mission control regions including the Baltic Sea, the North Sea, North America and the Caribbean Sea have already set a sulphur limit of no higher than 0.1%m/m). The Global Sulphur Cap will require shipping companies to use for low-sulphur fuel, emission abatement technologies or use alternative energy sources such as LNG. This measure will greatly reduce the environmental impact of global shipping.

"Intelligent ports and green ports" are the trends leading port development

"Intelligent ports" will represent the direction of future port development. The rapid development of technologies such as big data, Internet of Things, artificial intelligence, virtual reality and enhanced displays has laid the foundation for development of intelligent ports. Reduction of ship pollution emission and building of green ports have also garnered consensus in the port industry.

The Shanghai Yangshan Deep Water Port, which was fully operational in December 2017, is currently the world's largest and most automated container terminal. With highly automated and intelligent operating system, the Shanghai Yangshan Deep Water Port is able to achieve 30% increase in productivity and 70% reduction in labour costs as compared with traditional container terminal. It has become a role model for the construction of "intelligent port and green port".

The "Polar Silk Road" promotes the development of polar shipping

The Arctic Waterways include the Northeast Passage, the Northwest Passage and the Central Passage. The Northeast Passage, co-built by China and Russia, originates from the seas north of North West Europe in the west, and traverses eastward through the Barents Sea, Kara Sea, Laptev Sea, East Siberian Sea, the Bering Straits, and stretches all the way to Vladivostok in the east. It is the shortest sea passage connecting North East Asia to Western Europe. The development of Arctic Waterways will draw economic and commercial interest as the passageway greatly shortens ship voyages between Asia, Europe and North America. The benefits include reduction of transportation costs, improvement of navigation safety, thus stimulating the development marine transportation industry in the northern hemisphere. The "Polar Silk Road" provides opportunities for win-win collaboration among countries along the Arctic coast. It also fosters a closer relationship among the three continents of Asia, Europe and North America.

On 24 August 2018, the BBC reported that while it used to take 48 days to sail from China to Rotterdam via the Suez Canal, the voyage will be shortened by about 20 days via the Arctic Waterways. According to data from the Russian Arctic Logistic Centre, there were 297 ships sailing through the Northeast Passage in 2016, an increase of 35% over the previous year. In the future, with accelerated melting of Arctic ice, ships traversing the Sino-Russia and Sino-Europe routes through the Northeast Passage will be increasing year by year.

Port district integration will promote the development of bay-area economies

The concept of a bay area economy is an important growth driver for the development of the world economy. A bay area is bestowed with several competitive advantages including superior geographical factors, good economic foundation, congregation of creative talents, and high degree of collaboration among supporting cities. The three ubiquitous bay areas of the world, namely New York Bay Area, San Francisco Bay Area and Tokyo Bay Area, are relatively well-developed with excellent port district integration and higher per capita GDP. They are excellent examples of economic development of bay areas.

On 18 February 2019, China released the "Guangdong-Hong Kong-Macau Greater Bay Area Development Plan". The guiding document made comprehensive plans for the strategic positioning, development goals and spatial layout of "Guangdong-Hong Kong-Macau Greater Bay Area". With further development in port district integration and urban integration, the "Guangdong-Hong Kong-Macau Greater Bay Area" will become an important element of the Chinese economic map in the future.

The International Shipping Markets – Outlook Mid 2019

Nigel Gardiner
Drewry

May 18th, 2019

In mid-2019 international shipping markets are confronted by a number of issues – some immediate and some further down the line. Of the immediate issues, concern over the outlook for the world economy, trade friction between the US and China and the impending implementation of the International Maritime Organisations (IMO) 2020 fuel regulations all threaten to disrupt markets. But perhaps the greatest disruptor is how concern for the environment will shape shipping markets in decades to come.

For the moment world seaborne trade continues to grow (see table below), but questions concerning "peak demand" for different fossil fuels are increasingly being raised. Coal's share of global energy demand is already falling and will continue to do so. The consequence of which will be that less coal is moved by sea. In the oil sector, seaborne movements of refined products are threatened by car use peaking in many countries and the environmental push to electric vehicles. While in the container sector the growth of "near shoring", in part to meet environmental concerns, will disrupt and in some cases reduce trade volumes on some traditional routes.

Seaborne Trade
－Million Tonnes

Time	Liquids	Dry Bulk	Other	Total	Time	Liquids	Dry Bulk	Other	Total
2008	3.318	3.264	1.823	8.405	2014	3.623	4.589	2.020	10.233
2009	3.291	3.235	1.555	8.080	2015	3.781	4.589	2.062	10.431
2010	3.408	3.651	1.803	8.862	2016	3.804	4.696	2.110	10.610
2011	3.436	3.846	1.919	9.200	2017	3.945	4.857	2.151	10.953
2012	3.476	4.041	1.939	9.455	2018	4.033	4.981	2.194	11.208
2013	3.549	4.439	1.980	9.967	—	—	—	—	—

CAGR-%

Time	Liquids	Dry Bulk	Other	Total	Time	Liquids	Dry Bulk	Other	Total
2008 ~ 2018	2.0%	4.3%	1.9%	2.9%	2013 ~ 2018	2.6%	2.3%	2.1%	2.4%

Source: Drewry Maritime Research

Amid these developments individual shipping markets continue to display their own characteristics and to be at different points in the normal market cycle (see following chart below).

In the main, supply side pressures are easing as a result of lower levels of new ordering and rising demolition of ageing vessels ahead of the new fuel regulations. This is important as growth in shipping demand in the future is likely to be at a "new normal" – that is, below rates seen historically. Our short-term view on the outlook for the three main sectors – Containers, Dry Bulk and Oil Tankers is as follows.

Containers

A prolonged trade friction between the US and China is an obvious threat to the sector, but attention in the container market is now focussing on 1 January 2020 when the new IMO low-sulphur fuel regulations become effective.

The industry's fuel bill in 2020 is likely to rise by approximately $15 billion. The quantum will slide back in later years as the availability of low-sulphur fuel increases, but failure to improve on the standard 50% fuel cost recovery of the past could have disastrous consequences for liner profitability.

Drewry believes that carriers will be able to pass on approximately 75% of the cost difference between the cheaper heavy sulphur fuel oil (HSFO) and dearer low sulphur fuel oil (LSFO). Although strong resistance from beneficial cargo owners (BCOs) can be expected, carriers will be more successful than in the past in passing on this cost increase, due to wider market acceptance of burden sharing. In this scenario, global freight rates are expected to rise in 2020 by around 8.0%.

While GDP forecasts have indeed been trimmed across the globe every region is expected to see growth in each of the next five years, albeit at a slightly slower pace than previously anticipated. For 2019, global container handling is expected to grow by 3.9% and thereafter to average 5% per annum over the next four years.

The supply side is also set to improve after a difficult 2018. The world's fully cellular containership fleet increased by 5.7% in 2018, which was the largest annual rise since 2015 (8%). The main contributor to fleet growth in 2018 was the record delivery of 26 18,000 teu+ Ultra Large Container Vessels (ULCVs) that added around 525,000 teu to the capacity total. Looking ahead, supply pressures will ease slightly as a combination of delivery delays and heightened scrapping ahead of IMO 2020 will slow the containership fleet growth to a more manageable rate of 3.2% in 2019. Moreover, a dwindling appetite for ULCVs should keep fleet inflation at similarly low levels through the duration of our forecast period to end 2023.

Based on current projections, the supply-demand index is expected to gain ground with each passing year over a five-year horizon. The caveat to this longer term prediction is that it is dependent on carriers and other shipowners sticking to a disciplined approach to new containership orders.

Dry bulk: slow fleet growth provides respite,but excess shipbuilding capacity could mar outlook

Crude tanker: Earnings of crude crudetankers to improve gradually as demolitions will offset the impact of newbuilding deliveries.

Product tanker: Product ankerst to benefit from higher freight rates.

LPG shipping: LPG vessels to remain amply supplied for the next two years,keeping rates under pressure.

LPG shipping: LNG shipping has a bright outlook as the US LNG exports starts to pick up pace,resulting in vessel demand and freight rates. It is expected to peak in 2019.

Container shipping: Container shipping to recover to an extent in 2019. Longer term structural changes could sustain profitability

Port operators: The ports sector remains under pressure from slower growth, vessel upsizing and increased customer power

Dry Bulk

In the dry bulk sector the principal risk to demand is climate related. As major economies shift to renewable sources of energy to meet power requirements, demand for coal is expected to fall. Indeed, many European countries have already well defined plans in place to phase out their use of coal. The most recent one being the largest coal consumer in Europe – Germany – which has announced it will phase out coal-fired power plants completely over the next 19 years. This effort is already underway and a quarter of existing coal-fired plants will be closed over the next three years. Seaborne trade in coal is therefore expected to peak by 2021 and thereafter weaken, affecting the employment of mid-sized dry bulk vessels.

Elsewhere, many steel producers in China are shifting to use electric arc furnaces (EAFs) which require scrap as the raw material. The use of EAFs in place of blast furnaces will make a part of iron ore and coking coal demand redundant, with further negative impacts on seaborne trade. As a counterbalance, over the past two years, India has emerged as a major iron ore importer, as its steel requirement continues to grow at a brisk pace. If India increases its investment in infrastructure over the next few years, any slowdown in dry bulk demand in China will be more than compensated for India.

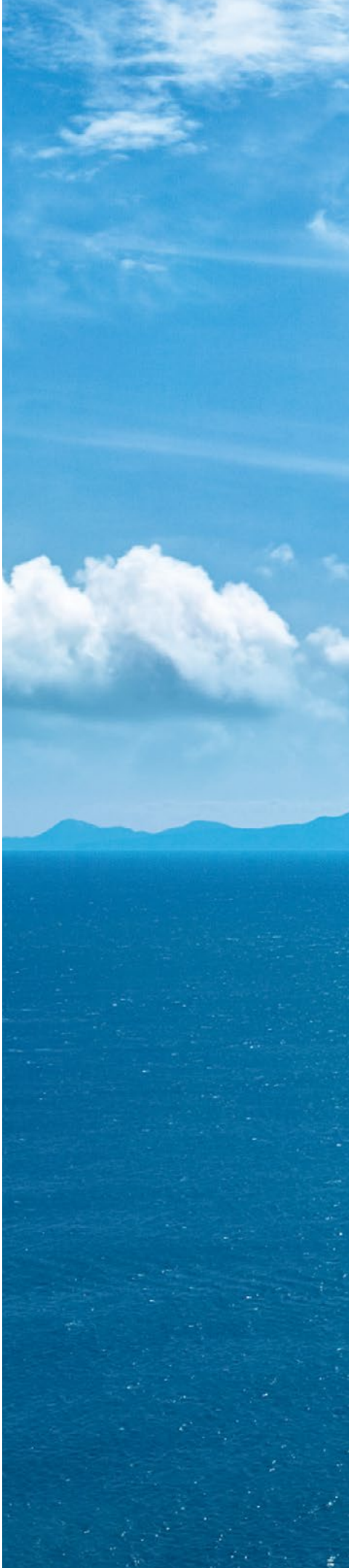
On the supply side dry bulk demolitions are expected to rise and together with a comparatively small orderbook will push supply growth to historical lows over the next five years. In this scenario charter rates will rise, with the one-year time charter (TC) rate for a five-year-old 180,000 dwt Capesize vessel forecast to be close to $21,000pd by the end of 2020, an increase of almost 50% from current levels.

Oil Tankers

The outlook for the crude tanker market is positive, but US foreign policy has heightened the risk to recovery. A bullish demand forecast, an uptick in estimates for US crude production and a corresponding rise in the forecast for the country's long-haul exports, plus a positive impact of the IMO regulation on the tonnage demand-supply balance will pave the way for recovery in freight rates in the remainder of 2019.

Tanker freight rates will improve further in 2020 as strong tonne-mile demand and low fleet growth increase tonnage utilisation. The recent upward revision in US crude oil production forecast by the International Energy Agency (IEA) suggests that the country's crude oil output will now peak in 2022 instead of 2020. US crude exports on the long-haul route to Asia will continue to increase briskly until 2022, boosting tonne-mile demand for crude tankers. Meanwhile, asset prices will also increase over the next two years in tandem with the expected recovery in freight rates.

Balanced against the above, threats to a tanker market recovery have increased in recent months, on the back of US foreign policy which poses risk to global oil trades. While an unexpected end to Iran sanction waivers is threatening to tighten global oil supply, the escalating trade friction between the US and China threatens to derail growth in global oil demand. Longer term the oil sector will come under increasing pressure from the growth of renewable energy and the advancement of electric vehicles in the drive to reduce environmental pollution.

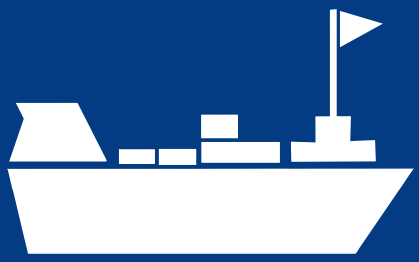


Xinhua-Baltic International Shipping Centre Development Index

Chapter 2

Fundamental Elements of International Shipping Development Index

1. Functional Significance
2. Design Principles
3. Framework of Indicators
4. Samples Selection



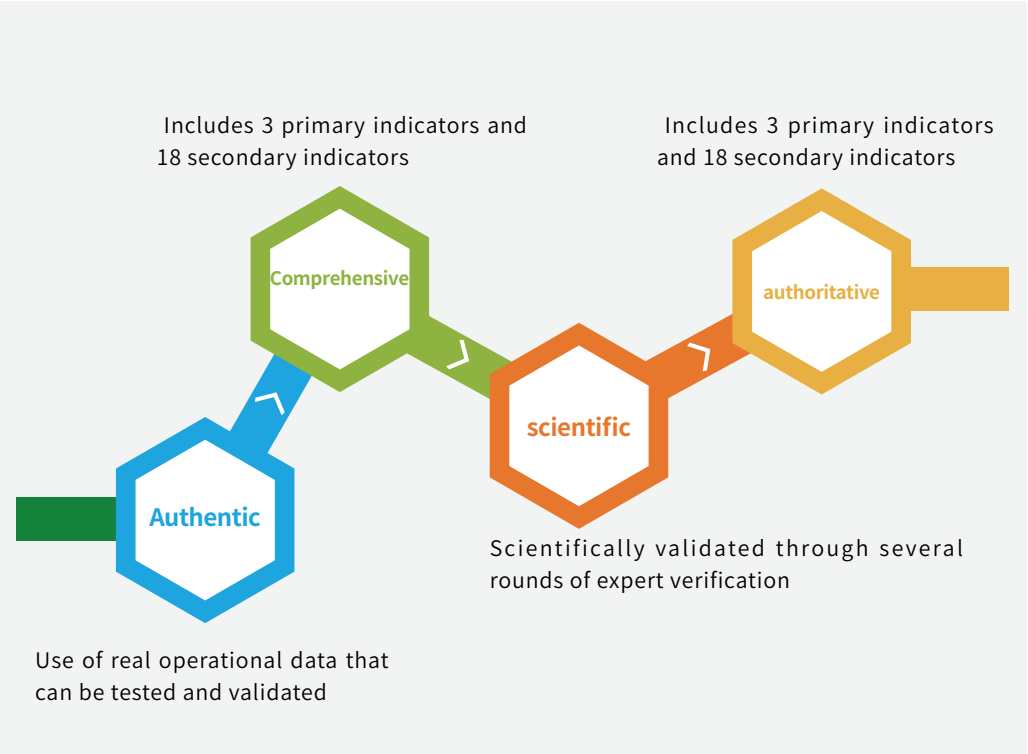


Figure 1 Design principles of Xinhua-Baltic International Shipping Centre Development Index

1. Functional Significance

Xinhua-Baltic International Shipping Development Index is a numeric grading of selected shipping centres, against certain set criteria. It is a systematic and comprehensive evaluation model that employs corresponding indexing methods to quantify assessment with the goal of measuring the true reflection of a port city's general strength at a predefined time period. A simple, intuitive, objective and impartial measure of the level of development and state of international shipping centres, the index will be a valuable guide and reference for the development of international shipping centres. It will also have a role in promoting sustainable development and optimal allocation of resources in the world's maritime trades.

2. Design Principles

Objective: Emphasis on using real operational data that can be tested and verified whilst minimising the use of synthetic indicators. Fundamental indicators that can be tested and are accessible will be used. The method allows for weighted computation with adjustment mechanism to prevent ambiguity while preserving traceability of the index. The analysis method for the index is objective and reproducible.

Comprehensive: The index system comprises 3 primary indicators and 18 secondary indicators to comprehensively reflect the state of development of international shipping centres. The index has some extensibility to cater for future research and allows for maximum improvement by way of amendments and supplements in response to industry feedback and suggestions.

Scientific: The index system's indicators have undergone several rounds of verification through feedback by both domestic and foreign experts and confirmed by an expert committee. Each indicator reflects a certain aspect of the city housing the international shipping centre. Taken together, all indicators will coalesce into an index system that meets the requirements of being logical, conforming, representative, relevant and that has relative independence.

Authoritative: All the selected indices are derived from domestic or foreign authoritative statistics that are standardised and stable data sources. Such data are easy to compare and compute, and the assessment indicators are clear. Having been put through several rounds of feedback and consideration, the weightage system is not only authoritative but also directive.

3. Framework of Indicators

Based on the indicator selection principles of Xinhua-Baltic International Shipping Centre Development Index, the index establishes an objective evaluation index system. All indicators came from authoritative agencies, whose raw data can be obtained from public sources, or computed systematically and scientifically. The indicators are maintained by a professional team that regularly updates the data sources.

The index system includes 3 primary indicators and 18 secondary indicators. Of these, primary indicators characterise the inherent laws of urban development of an international shipping centre through 3 dimensions – namely, the port conditions, shipping services and the general environment. Secondary indicators are the expansion on specific functional attributes of the primary indicators. The various levels of indicators are weighted and combined progressively in consideration of their authenticity, comprehensiveness and availability of data.

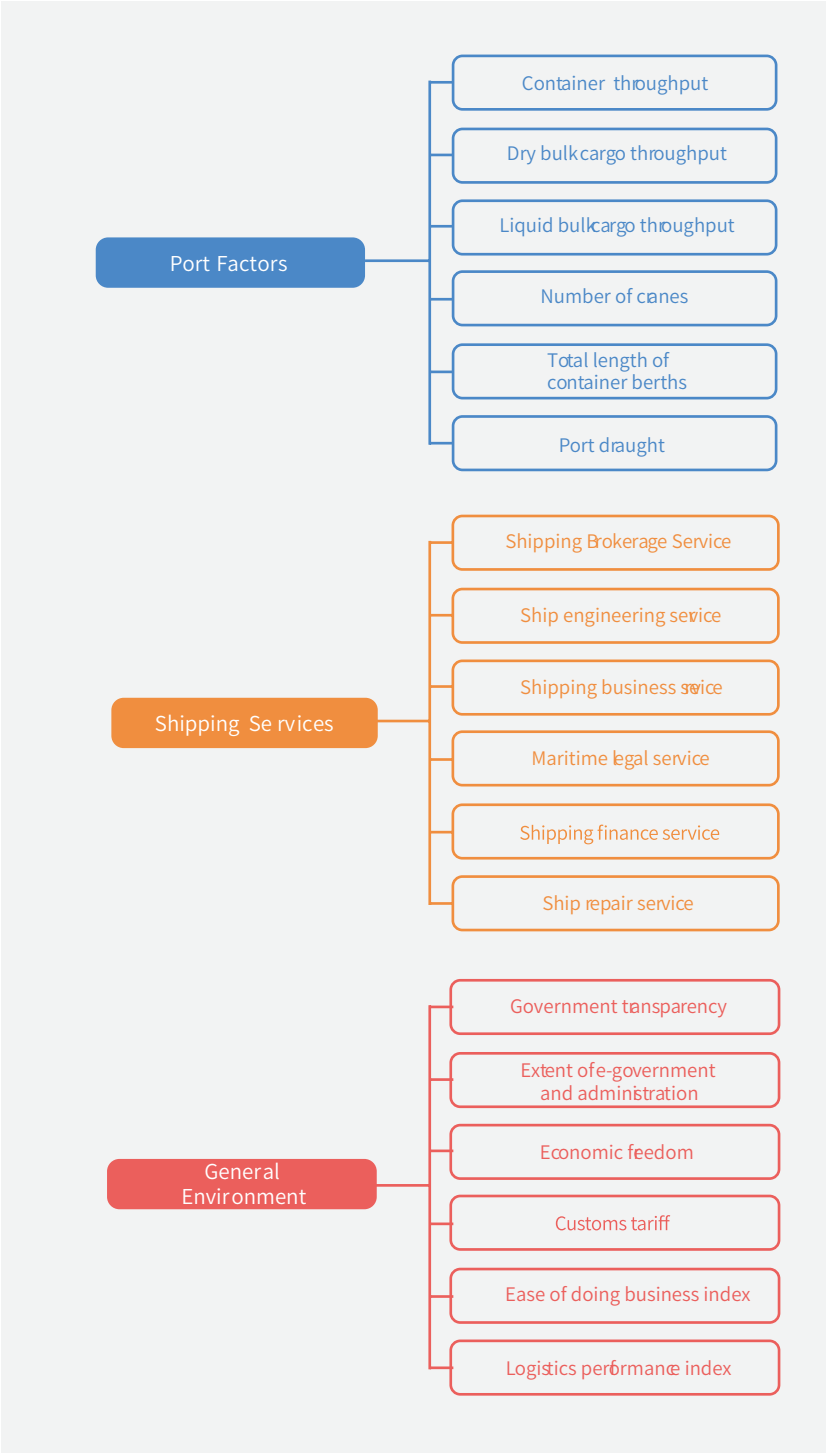


Figure 2 Framework of indicators for Xinhua-Baltic International Shipping Centre Development Index

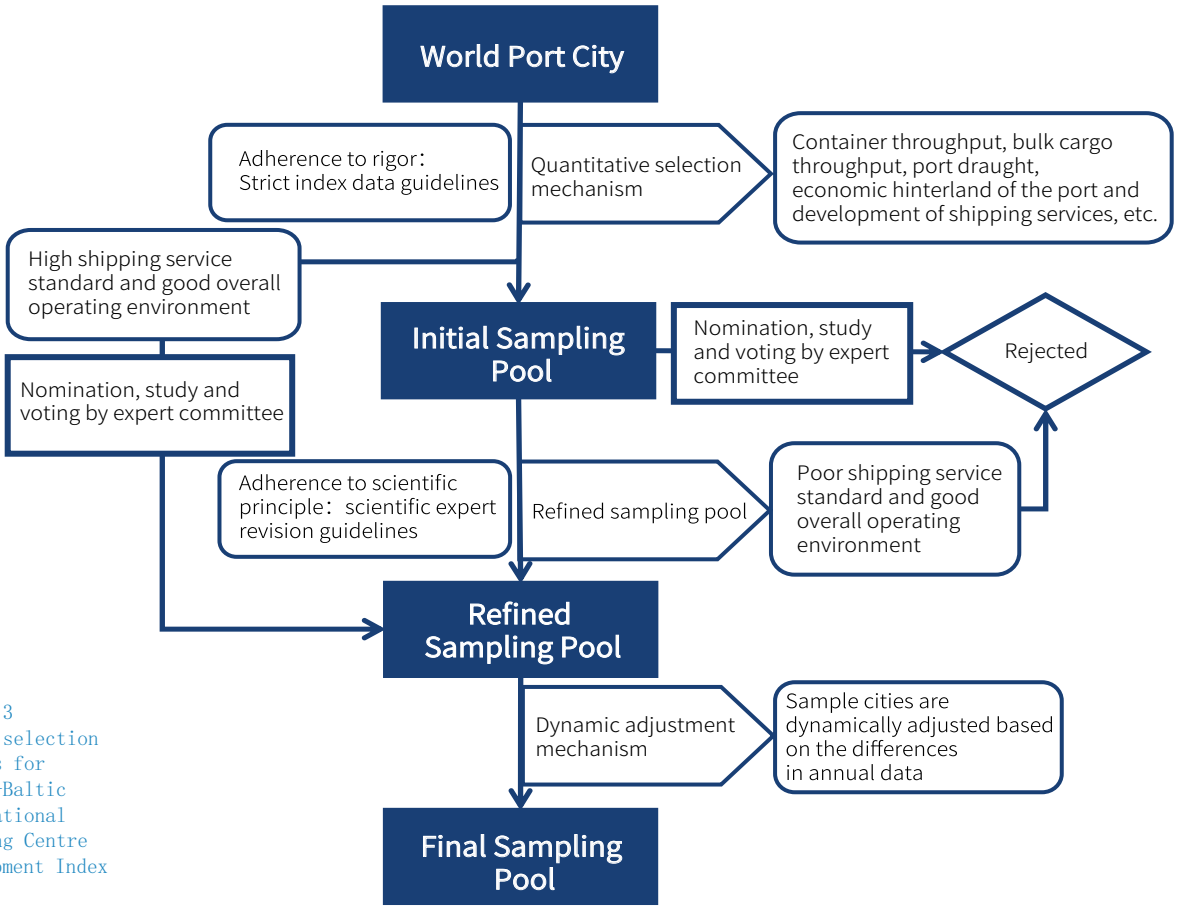


Figure 3
Sample selection process for Xinhua-Baltic International Shipping Centre Development Index

4. Samples Selection

The selection of samples for the international shipping centre development index is based on a few basic principles: It not only observes full compliance with data standards for port city core indicators but also takes full consideration of comments and opinions of the Global Shipping Experts Committee. The synthesis of qualitative and quantitative analysis is primarily achieved through the use of data standard, and supplemented by a number of expert opinions.

Step 1 Basic sampling guidelines for international shipping centre are based on the data standard of a port city's core indicators with focus accorded to container throughput, bulk cargo throughput, port draught, economic hinterland of the port and development of shipping services.

Step 2 Based on professional assessment and recommendations by members of the Global Shipping Experts Committee jointly formed by China Economic Information Service and the Baltic Exchange, the committee shall, by way of vote, select port cities shortlisted in the initial sampling pool that may satisfy the following port category conditions to form a refined sampling pool:

1) For some ports included in the initial sampling pool, even though their current throughput may be large, they may be weak in other shipping services. The expert committee shall, by way of vote, decide if these ports should be eliminated. There are numerous such emerging port cities in the Asia Pacific region.

2) For some port cities not included in the initial sampling pool, even though their current throughput may be relatively small, they have a high standard of shipping services and good business operating environment. The expert committee shall, by way of vote, decide if these ports should be included in the sampling pool. There are such port cities in Europe and America that provide traditional shipping services.

Supplementary explanation of voting mechanism for inclusion of sample: "Nomination – Research – Voting" process is adopted. During the nomination process, emphasis must be put on general recognition of the port city's position in the world. The research process focuses on advanced integration of capital flow, information flow and goods flow, as well as the degree of contribution by the port function toward urban development. The voting phase focuses on fairness by drawing judgement from several experts.

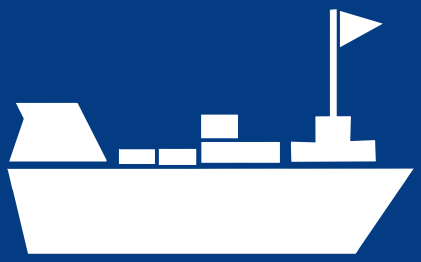
Step 3 After the two selection processes above, a final sampling pool for international shipping centres is established. This sampling pool is adjusted dynamically according to changes in annual data. Only port cities that meet the screening requirements are eligible for global competitiveness assessment.

Xinhua-Baltic International Shipping Centre Development Index

Chapter 3

Evaluation Results of International Shipping Centre Development Index

1. General evaluation
2. Tier Evaluation
3. Stability Evaluation
4. Samples Selection



1. General evaluation

The development index results show that the top ten international shipping centres in the world in 2019, by order of ranking, are: Singapore, Hong Kong, London, Shanghai, Dubai, Rotterdam, Hamburg, New York-New Jersey, Houston and Athens. Compared to 2014-2019, the overall evaluation results are relatively stable.

Shipping centres of emerging economies in the Asia-Pacific region are still trending strongly upwards. Singapore retained its leadership position for six consecutive years. Based on the evaluation scores, there is a decreasing gap in the development level between Singapore and London. Hong Kong, benefiting from the "Belt and Road Initiative" and the strategic opportunities offered by the "Guangdong-Hong Kong-Macau Greater Bay Area", secured the second place. As important cities of emerging economies, Shanghai and Dubai were closing up with London in terms of shipping development level, and were ranked fourth and fifth respectively. They were supported by rapidly developing modern shipping collection and distribution system, continuous improvement in shipping services, innovative free-trade measures, and continuous improvement of business environment.

The development trend of conventional shipping centres in developed countries tends to be stable. Affected by the overall weak economic growth of the European region, the development situation in London, Hamburg and Rotterdam is relatively stable. Houston, supported by its enhancement in maritime legal services and financial services, joined the Top10 Chart for the first time to occupy the ninth place. Athens beat Tokyo by a whisker to occupy the last spot in the Top10 Chart.

Ranking	2019	2018	2017	2016	2015	2014
1	Singapore	Singapore	Singapore	Singapore	Singapore	Singapore
2	Hong Kong	Hong Kong	London	London	London	London
3	London	London	Hong Kong	Hong Kong	Hong Kong	Hong Kong
4	Shanghai	Shanghai	Hamburg	Hamburg	Rotterdam	Rotterdam
5	Dubai	Dubai	Shanghai	Rotterdam	Hamburg	Hamburg
6	Rotterdam	Rotterdam	Dubai	Shanghai	Shanghai	Dubai
7	Hamburg	Hamburg	New York-New Jersey	New York-New Jersey	Dubai	Shanghai
8	New York-New Jersey	New York-New Jersey	Rotterdam	Dubai	New York-New Jersey	Tokyo
9	Houston	Tokyo	Tokyo	Tokyo	Busan	New York-New Jersey
10	Athens	Busan	Athens	Athens	Athens	Busan

Table 1 Top 10 port cities of Xinhua-Baltic International Shipping Centre Development Index

2. Tier Evaluation

With the application of new technology and contemporary concepts such as big data, automated terminals, intelligent ports and green ecology, various new forms of businesses and services are beginning to emerge in the shipping industry. Thus, there has been growing emphasis on the development of port cities, especially in areas of environment, education and shipping finance services. In particular, shipping services have gradually broken the boundary of spatial geography and are beginning to realise resource optimisation on a global scale. With this in mind, the report explored a new tier system for shipping centres to provide a more scientific review of global shipping centres. Three tiers were identified: namely the traditionally-renowned tier, the innovation-leader tier, and potential-for-development tier.

The traditionally-renowned tier of shipping centres includes Singapore, Hong Kong and London, etc. The trio were in the leading pack with evaluation scores greater than 80 points. Especially with Singapore in the absolute leading pole position at 97.85 points and leading the second place Hong Kong by more than 10 points. These shipping centres capitalise on their locations in developed shipping markets to provide comprehensive shipping services with abundant logistics and transportation support. Playing the role of international shipping hubs servicing a myriad of maritime trade routes and air flights, their development is buoyed by financial momentum from international economies and trades. Even under the backdrop of continuously emerging new capitals, new technologies and new services, the traditionally-renowned shipping centres remained the backbone of global shipping development.

The innovation-leader tier includes international shipping centres around the Asia-Pacific such as Shanghai, Dubai, Ningbo Zhoushan, and Guangzhou. With evaluation scores above 60, compared to the traditionally-renowned tier, these shipping centres play catch-up with the cumulative experience of being a late-comer. Shanghai is worth a special mention; for it is now close on the heels of Hong Kong and London, based on the evaluation scores. With the progressive realisation of deep-integration strategy encompassing the "Belt and Road Initiative + Free Trade Zone + Shipping Centres", Shanghai will become the important crossroads of the Yangtze Economic Belt, as part of the Belt and Road Initiative. Continuous improvement in port operating efficiency has also helped Shanghai to become the world's largest port in terms of container throughput as well as one of the three major ports in terms of cargo throughout. With the implementation of the Yangtze River Delta integration strategy, Shanghai, as one of the most important international shipping centres in the world, will exert even greater influence in the international shipping industry.

The potential-for-development tier of shipping centres includes developing ports such as Newcastle, Tanjung Pelepas and Port Klang. With evaluation scores generally below 60, these port cities may be prominent in some aspects and exhibit distinctive characteristics. With an overall advancement in trade, shipping, finance and technology in the Asia-Pacific region, these port cities should exploit interconnectivity with the world's first tier shipping centres to improve their overall strength and development potential.

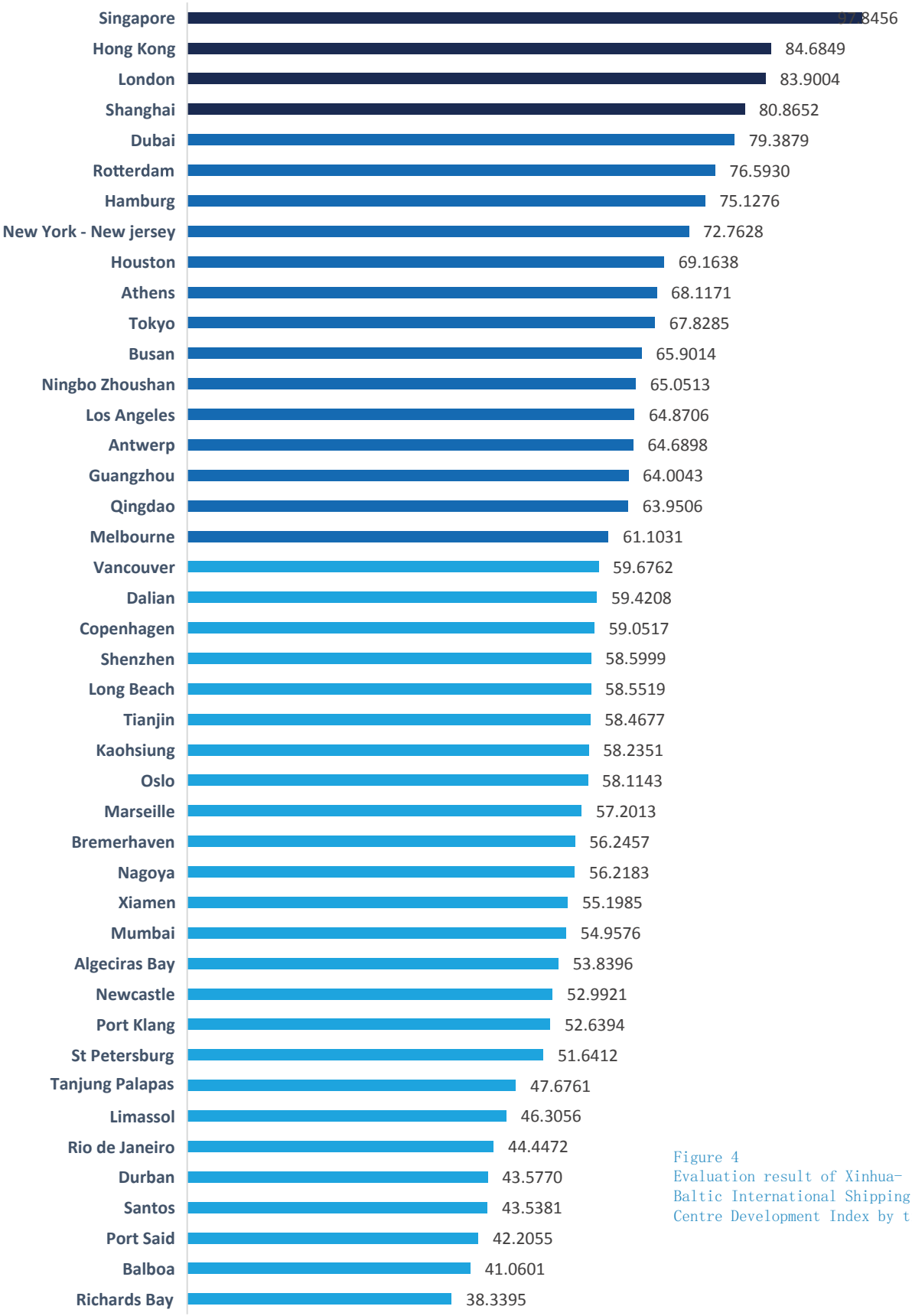


Figure 4
Evaluation result of Xinhua-Baltic International Shipping Centre Development Index by tier

3. Stability Evaluation

The ranking of international shipping centres in 2019 showed only small changes, which bespeaks stability of the system. Of these, there were 34 international shipping centres with stable or relative stable ranking. This accounted for 79.07% of the total sample count. Five shipping centres saw relatively volatile ranking shift, accounting for 9.30%of the total sample count. Five shipping centres saw abnormally volatile ranking shift, accounting for 11.63% of the total sample count.

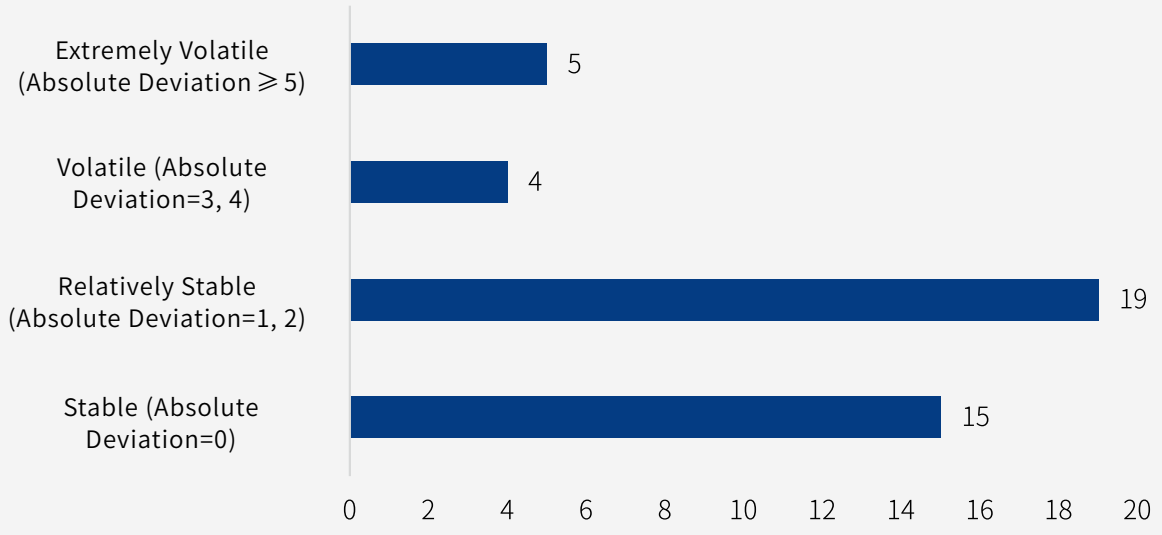


Figure 5 Absolute difference analysis of Xinhua-Baltic International Shipping Centre Development Index

4. Regional Evaluation

An evaluation of the 2019 index shows that four of the top ten shipping centers in the world are located in Asia, four in Europe and two in America. When comparing with the ranking of Asia shipping centers in between 2014 and 2019, ten cities ranked higher in 2019 than their first ranking in 2014, accounting for 55.56% of the total sample in Asia; Meanwhile, eight cities in Europe ranked lower than their first ranking in 2014, accounting for 66.67% of the total sample. Overall, the development speed of major shipping centers in Europe has slowed down, while the rising trend of Asian shipping centers has become more and more obvious.

Figure 6 Comparison of the ranking changes of Asian and European cities between 2014 and 2019.

2019 Ranking	Continennt	City	2019 Total	2019 Ranking	Continennt	City	2019 Total
1	Asia	Singapore	97.8456	23	America	Long Beach	58.5519
2	Asia	Hong Kong	84.6849	24	Asia	Tianjin	58.4677
3	Europe	London	83.9004	25	Asia	Kaohsiung	58.2351
4	Asia	Shanghai	80.8652	26	Europe	Oslo	58.1143
5	Asia	Dubai	79.3879	27	Europe	Marseille	57.2013
6	Europe	Rotterdam	76.5930	28	Europe	Bremerhaven	56.2457
7	Europe	Hamburg	75.1276	29	Asia	Nagoya	56.2183
8	America	New York-New Jersey	72.7628	30	Asia	Xiamen	55.1985
9	America	Houston	69.1638	31	Asia	Mumbai	54.9576
10	Europe	Athens	68.1171	32	Europe	Algeciras Bay	53.8396
11	Asia	Tokyo	67.8285	33	Oceania	Newcastle	52.9921
12	Asia	Busan	65.9014	34	Asia	Port Klang	52.6394
13	Asia	Ningbo - Zhoushan	65.0513	35	Europe	St. Petersburg	51.6412
14	America	Los Angeles	64.8706	36	Asia	Tanjung Pelepas	47.6761
15	Europe	Antwerp	64.6898	37	Europe	Limassol	46.3056
16	Asia	Guangzhou	64.0043	38	America	Rio de Janeiro	44.4472
17	Asia	Qingdao	63.9506	39	Africa	Durban	43.5770
18	Oceania	Melbourne	61.1031	40	America	Santos	43.5381
19	America	Melbourne	59.6762	41	Africa	Port Said	42.2055
20	Asia	Dalian	59.4208	42	America	Balboa	41.0601
21	Europe	Copenhagen	59.0517	43	Africa	Port of Richards Bay	38.3395
22	Asia	Shenzhen	58.5999	-	-	-	-

Note: Different colours represent different continents in which the shipping centres are located. Asia is coloured green; Europe blue; America purple; Africa yellow; and Oceania red.

Figure 2 Scores of Various International Shipping Centres and Their Distribution Across the Different Continents

(1) China-Japan-South Korea Shipping Route Area

China, Japan and South Korea are three major economic and trade powers. The total GDP of the three countries, taken together, accounts for 20% of the world’s GDP, or 70% of Asia’s GDP. With the continuous push for free trade zones within the China-Japan-South Korea region, there will be an expansion of trade among the three countries, laying the foundation for the group to become the world’s third largest economic region.

The shipping centre model has 13 sample cities within the China-Japan-South Korea Shipping Route Area, with an average evaluation score of 64.49. Of these, Hong Kong and Shanghai – ranked second and fourth respectively – are representative international shipping centres in East Asia. Meanwhile, Busan of South Korea and Tokyo of Japan are keen contenders of the top ten shipping centres. Having benefited from the steady and rapid development of China and the promotion of trade through the “Belt and Road Initiative”, Chinese ports such as Ningbo Zhoushan, Guangzhou and Qingdao have achieved great progress in shipping centre development.

Figure 7 Distribution of Shipping Centres in the China-Japan-South Korea Shipping Route Area

(2) Southeast Asia Shipping Route Area

The ASEAN represents an important economic and political organisation in Southeast Asia. It is an important economic sector in the Asia-Pacific region. It is close to the vital maritime channel of the Malacca Strait, which occupies a strategic geographical location. In the past ten years, with the rapid development of processing and entrepot trade in ASEAN member countries, throughputs in the various ports of these countries have grown tremendously.

The shipping centre model has three samples cities within the Southeast Asia Shipping Route Area, with an average evaluation score of 66.05. For six consecutive years, Singapore has occupied the pole position in terms of evaluation score, and is an important fulcrum for international shipping in Southeast Asia, East Asia as well as the Oceania region. As the centre of shipping financial services, maritime legal services, shipping operation services and shipping brokerage services within Southeast Asia, Singapore also provides most of the shipping services for East Asia. Port Klang and Tanjung Pelepas Port also see steady growth in port throughput.

Figure 8 Distribution of Shipping Centres in the Southeast Asia Shipping Route Area

(3) Indian Ocean Shipping Route Area

The North Indian Ocean is the only waterway for the shipping route between Europe and Asia; it is an important passage between the Gulf of Aden and the Malacca Strait. The Strait of Hormuz is the most important shipping route for crude oil transportation. All crude oil from main oil producing countries in the Middle East must pass through the Strait of Hormuz before delivery to international buyers, mostly in Asia.

The shipping centre model has two samples cities within the Indian Ocean Shipping Route Area. Dubai, ranked fifth based on the evaluation score, is the shipping hub of the region. Buoyed by China’s “Belt and Road Initiative”, China and the United Arab Emirates continue to strengthen their political, economic and cultural cooperation. Since 2017, China has become the largest trading partner of the UAE. Moving forward, Dubai will play a more important role in bilateral trade between the two countries. Benefiting from India’s rapid economic growth in recent years, Mumbai has advanced slightly to take the 30th position based on evaluation score.

Figure 9 Distribution of Shipping Centres in the Indian Ocean Shipping Route Area

(4) The Mediterranean Shipping Route Area

The Mediterranean Sea connects three continents – Asia, Africa and Europe – and thus plays a vital role in maritime traffic.

The shipping centre model has five sample cities within the Mediterranean Shipping Route Area – including four European cities and one African city – with an average evaluation score of 53.53; of which Athens ranked 10th. Since the take-over of Piraeus, the largest port in Greece, by China’s COSCO Shipping Corporation, the Athens-Piraeus Port Cluster has become a key shipping hub in the Mediterranean and the most dazzling port example of the “Belt and Road Initiative”. In June 2018, the fifth edition of the “Italian Maritime Economy Annual Report” pointed out that under the impetus of the “Belt and Road” construction, transportation routes of Asian trade have gradually developed into the leading driver of world trade. The importance of ports in the Mediterranean region is growing, together with their competitiveness. The largest container port in the Mediterranean region, Athens-Piraeus Port Cluster will play a greater role in driving the economic development of countries in the Mediterranean region .

Figure 10 Distribution of Shipping Centres in the Mediterranean Shipping Route Area

(5) North Sea Shipping Route Area

Since the era of medieval maritime exploration, the European North Sea has always been the key region for global navigation and trade. For centuries, it has been leading the development of global shipping. Port development in the North Sea region began to slow down in the 21st century due to the impact of rapid development of emerging economies in the Asia-Pacific region. However, having led global shipping development for such a long period of time, port cities within the North Sea area still hold strong competitive advantage in shipping brokerage service and maritime legal service. Therefore, their evaluation scores are relatively higher.

The shipping centre model has eight sample cities within the North Sea Shipping Route Area, with an average evaluation score of 65.67. Of these, London, Rotterdam and Hamburg are ranked second, sixth and seventh respectively based on the evaluation score. It can be seen that the North Sea area has a number of shipping centres listed in the Top10 Chart. London has an absolute global dominance in shipbroking and maritime legal services, while Rotterdam possesses the best port conditions in the North Sea area, or even in Europe.

Figure 11 Distribution of Shipping Centres in the North Sea Shipping Route Area

The Central and North America and Caribbean Sea Shipping Route Area

The North American region is currently the region with the highest GDP in the world. The Panama Canal, with the Pacific Ocean and Atlantic Ocean on either side, is the most important shipping waterway in the world. The shipping centre model has six sample cities within the Central and North America and Caribbean Sea Shipping Route Area, with an average evaluation score of 61.28. Of these, New York-New Jersey, Houston, Los Angeles and Vancouver in North America are ranked eighth, ninth, 14th and 19th respectively; their development was relatively more balanced .

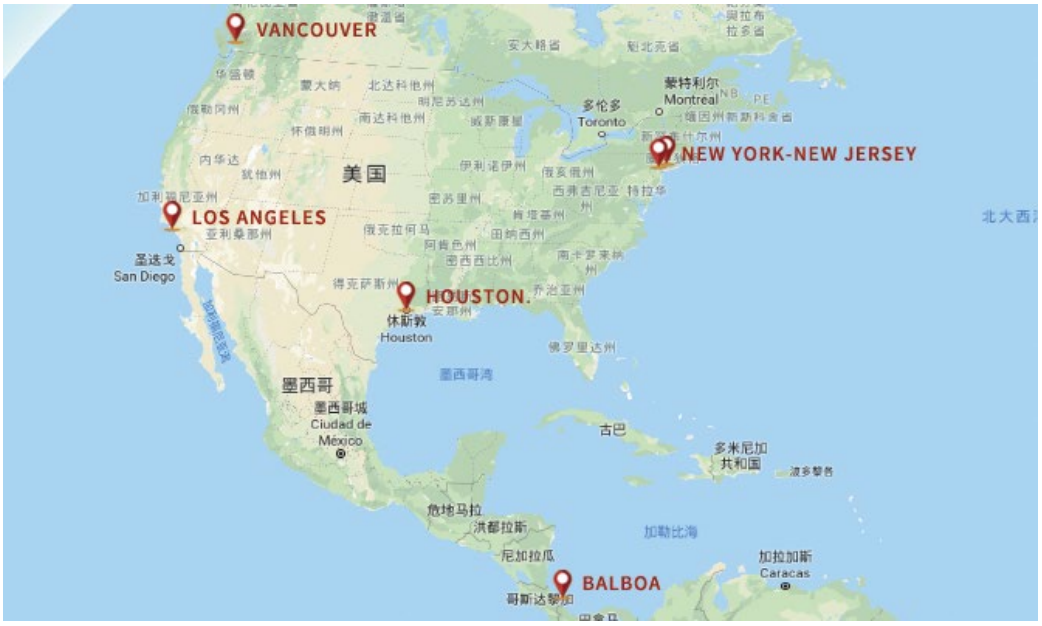


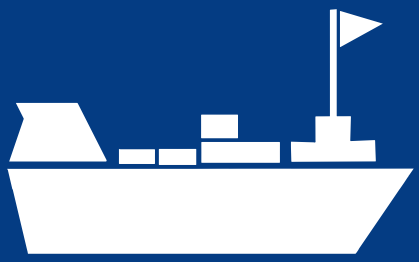
Figure 12 Distribution of Shipping Centres in the Central and North America and Caribbean Sea Shipping Route Area

Xinhua-Baltic International Shipping Centre Development Index

Chapter 4

Featured Topic Research: Global Shipping Services

1. Shipping Finance Service
2. Shipping Brokerage Services
3. Maritime Legal Services
4. Shipping Business Service



Shipping services are the core factors for assessing the competitiveness of international shipping centres. Shipping services are generally broken down into six categories: namely shipbroking, ship engineering, shipping business , maritime legal services, shipping finance and ship repair.

Evaluation of international shipping centres in 2019 shows the top ten port cities with the best shipping services are, by order of ranking: London, Singapore, Shanghai, Hong Kong, Athens, Dubai, Mumbai, Hamburg, Houston, and New York-New Jersey. Of these, Shanghai surpassed Hong Kong for the first time to take the third position. This is evident of the significant enhancement of its shipping operation ability.

Table 3 TOP10 Shipping Services of Xinhua-Baltic International Shipping Centre Development Index

Ranking	2019	2018	2017	2016	2015	2014
1	London	London	London	London	London	London
2	Singapore	Singapore	Singapore	Singapore	Singapore	Singapore
3	Shanghai	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong
4	Hong Kong	Shanghai	Shanghai	Shanghai	Shanghai	Dubai
5	Athens	Dubai	Athens	Athens	Athens	Shanghai
6	Dubai	Athens	Dubai	Dubai	Dubai	Hamburg
7	Mumbai	Hamburg	Hamburg	New York-New Jersey	Hamburg	Tokyo
8	Hamburg	New York-New Jersey	New York-New Jersey	Tokyo	New York-New Jersey	Mumbai
9	Houston	Tokyo	Mumbai	Hamburg	Tokyo	Athens
10	New York-New Jersey	Houston	Tokyo	Mumbai	Mumbai	New York-New Jersey

London offers first-class services in maritime legal and shipping finance, a reflection on the international influence of traditional shipping centres. Meanwhile, Singapore shows strength in ship management and ship brokerage services, which commensurate with its status as the shipping hub of the Asia-Pacific region. On the other hand, there is still some room for improvement in maritime legal, shipping finance and shipping brokerage services for Shanghai and Hong Kong. With the continuous development brought about by the "Belt and Road Initiative" and the rapid economic development in the Asia-Pacific region, Shanghai and Hong Kong will certainly improve in their level of shipping services in the future.

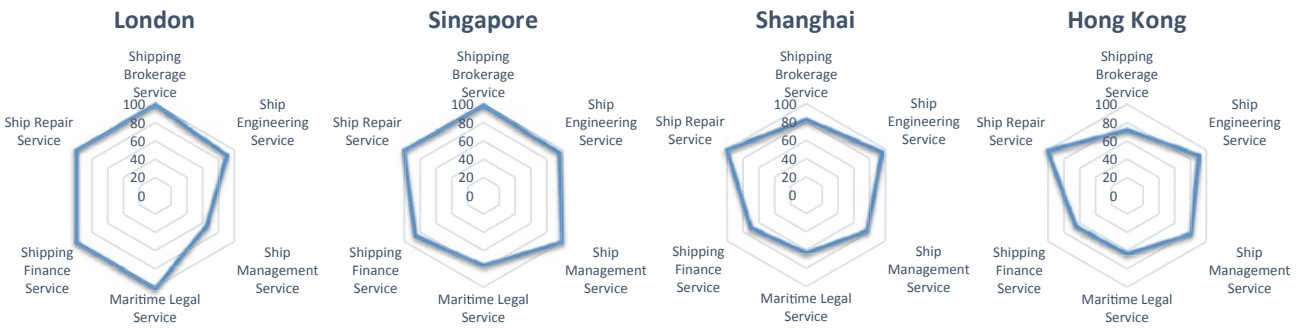


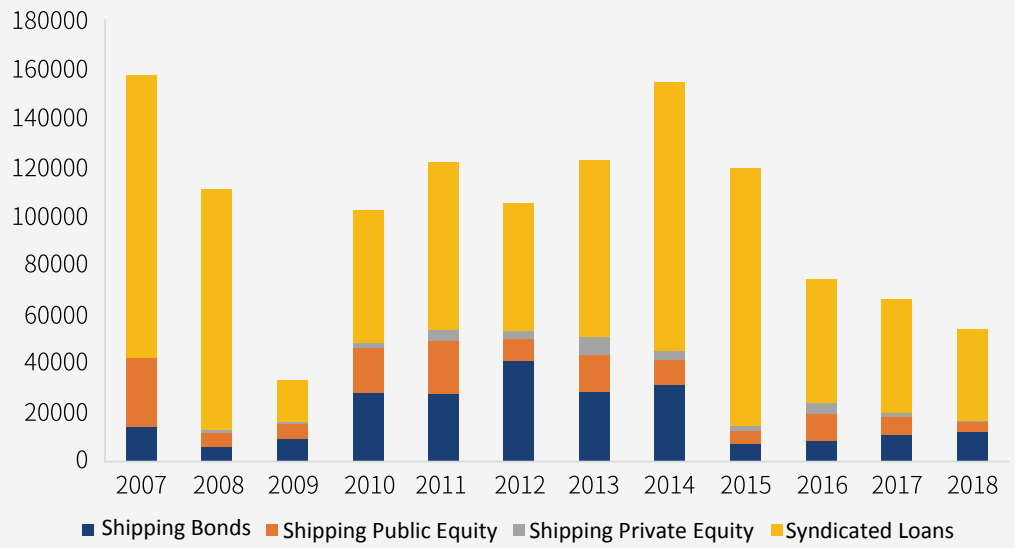
Figure 13 Top 4 Shipping Services

1. Shipping Finance Service

As a capital-intensive industry, the shipping industry requires significant capital investment in infrastructure and shipbuilding. Hence, shipping finance service plays a vital role in the shipping industry and construction of international shipping centres. Its scope encompasses four areas: namely ship financing, maritime insurance, capital settlement, and shipping derivatives .

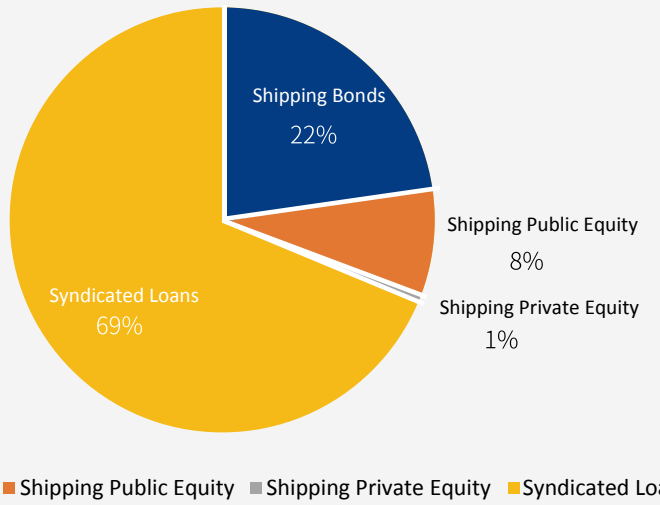
(a) Ship financing

Data from Marine Money show that global ship financing has maintained its volatile and downward trend since 2008, and was down 18% compared with 2017. Syndicated loans still account for majority of the traditional ship financing. Meanwhile, the debt capital market (DCM) has increased compared with 2017, and the proportion of equity capital market (ECM) was significantly lower.



Source of data:Marine Money

Figure 14
2007-2018 Volume of Global Shipping Finance (million USD)
Source of data: Marine Money



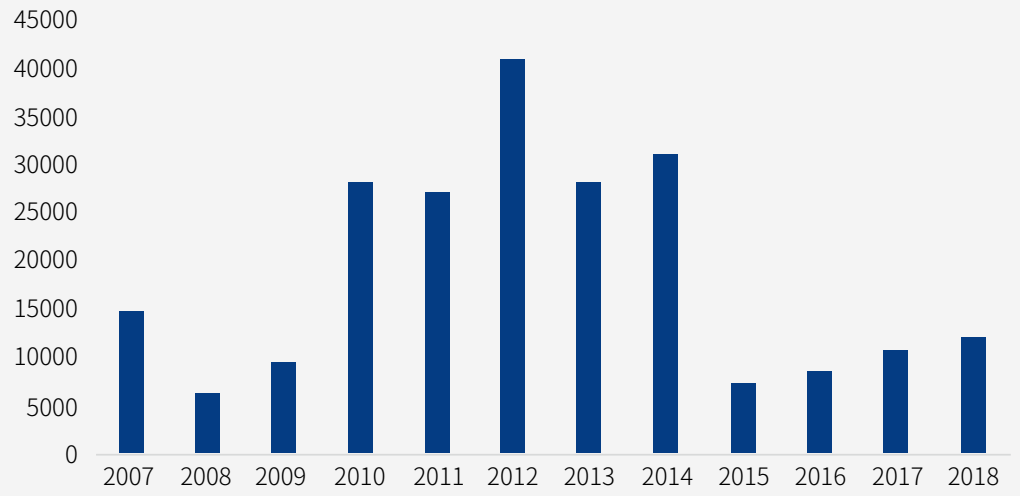
Source of data:Marine Money

Figure 15
Proportion of Different Types of Ship Financing
Source of data: Marine Money

1. Shipping Debt Capital Market (DCM)

The shipping debt capital market continues to grow. The debt capital market increased slightly in 2018 with a total DCM financing value of USD 12.12578 billion, up 13.10% compared to 2017.

Figure 16
2007-2018 Volume of Bond Financing (million USD)
Source of data: Marine Money

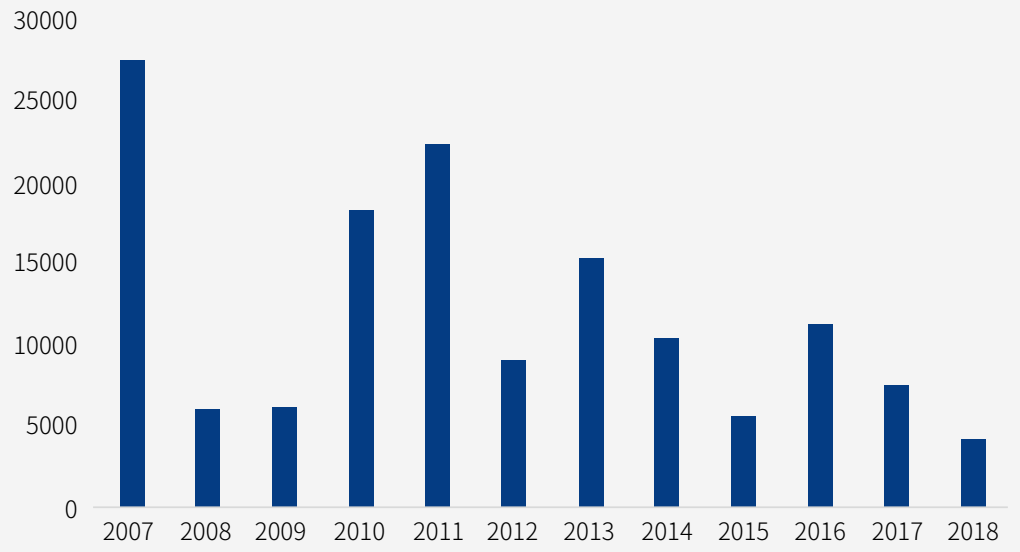


Source of data:Marine Money

2. Shipping Equity Capital Market (ECM)

Shipping equity capital market weakened with volatility. As can be seen from the 2016-2018 global shipping equity market data, the weakening trend with volatility is continuing. The total ECM financing value for 2018 was USD 4.24427 billion, down 44.15% compared to 2017, a significant contraction.

Figure 17
2007-2018 Size of Global Shipping Public Equity Investment (million USD)
Source of data: Marine Money



Source of data:Marine Money

In 2018, global shipping finance using private equity fell drastically to only USD 273.75 million, a mere 15.41% of last year’s financing quantum.

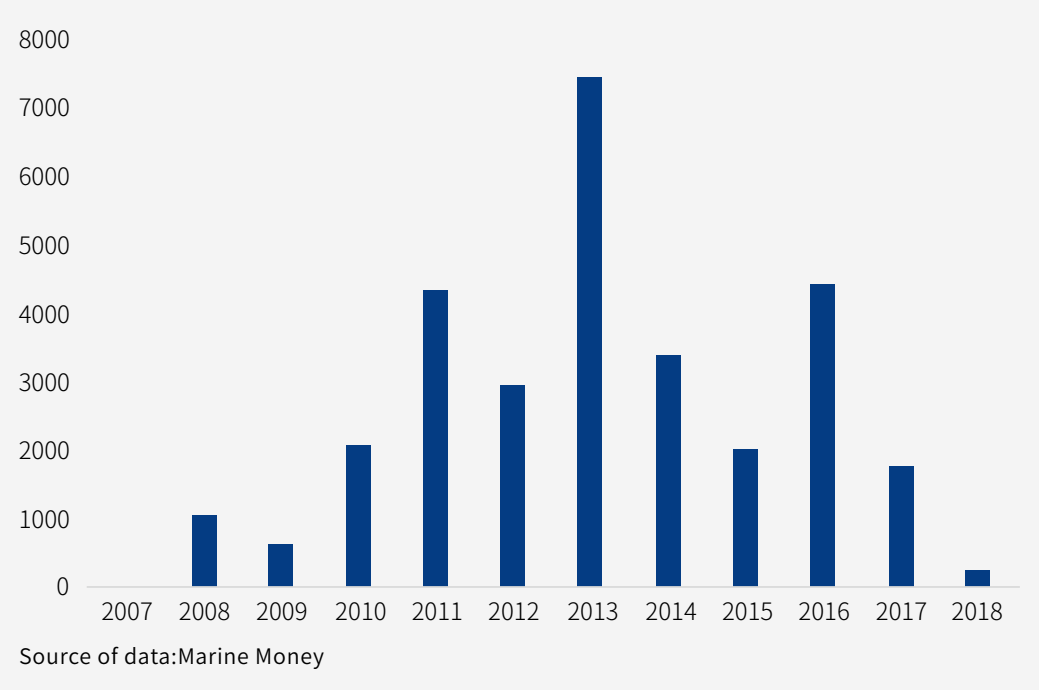


Figure 18
2007-2018 Size of Global Shipping Private Equity Investment (million USD)
Source of data: Marine Money

3. Syndicated loan financing

All along, syndicated loans, as the main mode of shipping financing, have been providing key support for the development of the shipping industry. Since the drastic drop of syndicated loans in 2016, the size of the syndicated loan market stabilised during 2016-2018, although it is still trending downward. It appears that the investment confidence of banks has yet to return. The total financing value of syndicated loan in 2018 was USD 37.447 billion, down 18.43% compared with 2017.

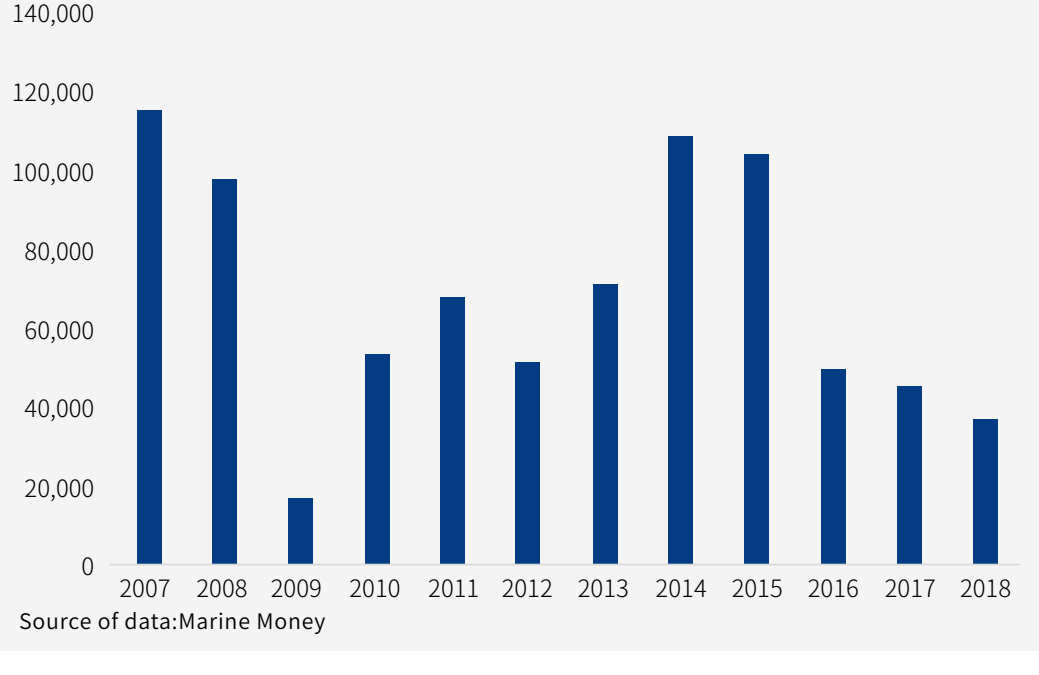
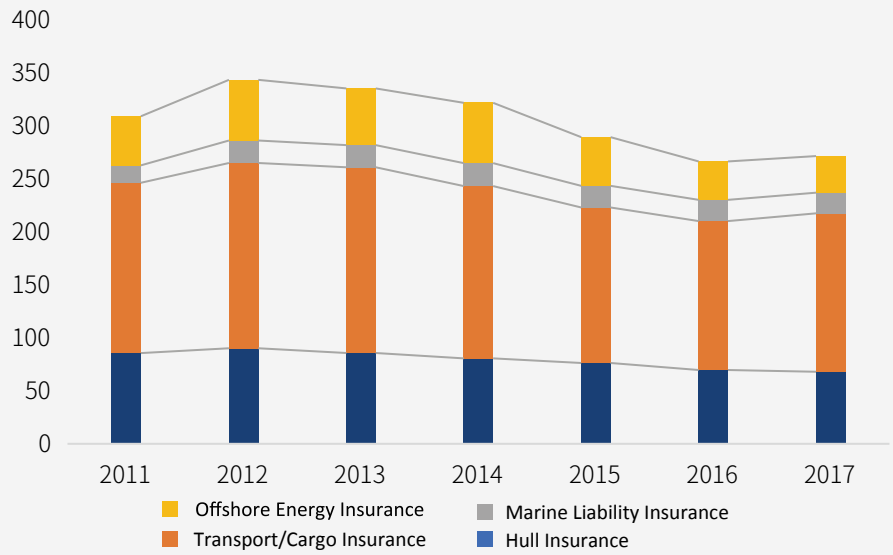
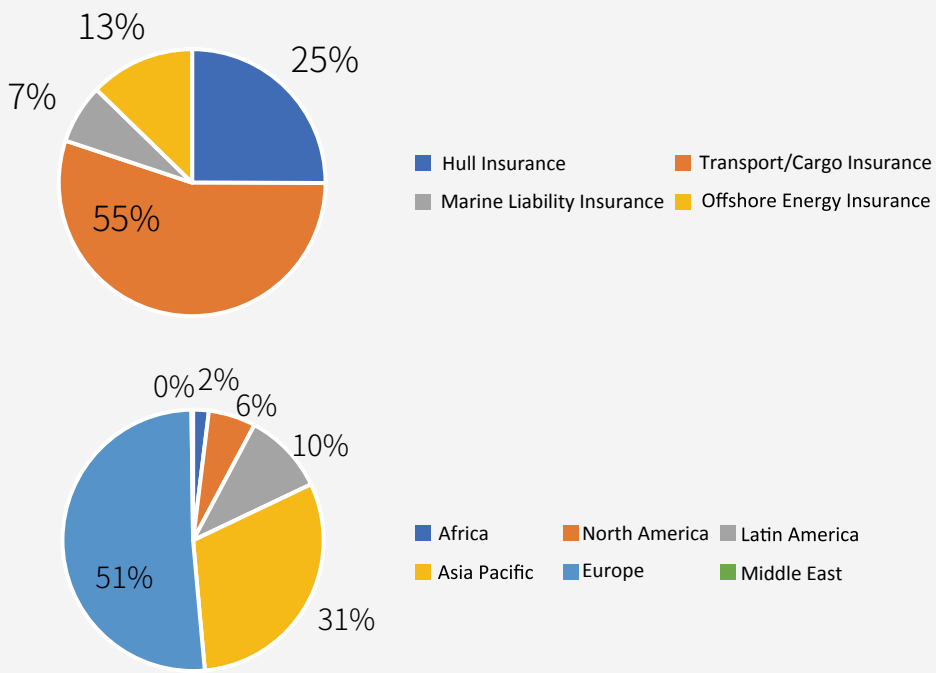


Figure 19
2007-2018 Size of Global Syndicated Loan Financing (million USD)
Source of data: Marine Money



Source of data: International Union of Marine Insurance (IUMI)

Figure 20
2011-2017 Global Maritime Insurance Gross Premium Income by Region (100mn USD) and Trends by Insurance Category



Source of data: International Union of Marine Insurance (IUMI)

Figure 21
2017 Global Shipping Insurance Premiums by Category and by Region
Source of data: International Union of Marine Insurance (IUMI)

(2) Maritime Insurance

2017 saw a slight increase in the maritime insurance gross premium income, a reversal of the five-year downward trend. This is a direct manifestation of the slight improvement in global shipping. However, we have yet to recover to the 2015 level. In 2017, the global maritime insurance gross premium income was USD 28.4bn, down 1.8% compared to 2016.

In terms of different insurance category, premium income from transport/cargo insurance accounted for 55% in 2017; while global hull insurance, offshore energy insurance and marine liability insurance accounted for 25%, 13% and 7% respectively. The proportion of premium income from transport/cargo insurance rose slightly. Geographically, Europe, being a veteran shipping centre with significant competitive edge, still accounted for more than 50% of the maritime insurance market.

FFA Hedging in an Increasingly Uncertain World

Head of Commodities,
Singapore Exchange

William Chin

25 June 2019

Forward Freight Agreement (FFA) hedging should require little convincing – more than 90% of global trade is conducted on the high seas but the elevated price risk (read volatility) in this "asset class" is often understated. It is worth noting that freight often emerges head and shoulders as the winner in a volatility competition of risky assets in a broad basket of agricultural, metals and energy commodities.

The urgency to hedge has increased as 2019 saw a roller coaster ride in prices. As a barometer of global health, the Baltic Dry Index entered the new year on bullish territory at 1,300 points – only to relinquish most of its gains and more after Vale's tailing dam burst. After dropping in spectacular fashion to stay a tad above 600 points, this has since whiplashed to 1,200 points. While the US-China trade friction has broadly redirected physical trade flows, this will have severe and long term consequences as the stand-off continues.

The World Bank estimates global growth in 2019 to slow to 2.6%, while the International Monetary Fund (IMF) forecasts conservatively-placed global trade flows to shrink by half a percentage point, which will see an estimated half a trillion dollars wiped off in 2020. This will inevitably translate into a big drop in demand with more ships expected to lay idle.

Men (and certainly ships) are not created equal, and we could see an outsized impact on Chinese participants for two key reasons. Firstly, China has overtaken Japan to become the world's second-largest ship-owning country, with Clarksons Research estimating Chinese-owned ships accounted for 170m gross tons of shipping capacity as at August 2018. Secondly, Chinese adoption of FFAs for risk management purposes remain low, as a result of large rumoured losses during the global financial crisis-led market crash in 2007, when Capesize rates plummeted from $140,000 to under $20,000 in the span of a few months. FFA participants in China have since remained cautious about the use of FFAs.

But a decade on and the world has changed significantly. Against a backdrop of declining Chinese FFA participation is the explosion of derivatives volumes on Chinese exchanges. The 2018 World Federation of Exchanges (WFE) IOMA reports that two out of the top three commodity exchanges were Chinese exchanges – accounting for over half of all commodity derivative volumes. The three major Chinese exchanges featured on the second, third and fourth spot of ranking tables respectively. Chinese institutions are becoming increasingly comfortable using derivatives in managing their cash flows, and the Chinese retail crowd are increasingly sophisticated in their trading strategies. Bloomberg recently reported "quant fever" in China, with thousands of individual investors reported to be building their own trading algorithms, equipped with affordable hardware and software.

Globally, and particularly in a nation of shipowners, the use of shipping derivatives is a critical and effective solution in managing downside risk. Derivatives are the epitome of risk management. Many other markets have early on embarked on the holy grail in optimising their physical and trading book through the use of derivatives and early adopters of FFAs are likely to outdo their peers in an increasingly fickle and competitive environment.

2019 marks the 13th anniversary since SGX sailed into the clearing of FFAs, and our role in shaping shipping risk management has become ever more relevant. With global trade powering ahead on the back of China's relentless rise, shipping is increasingly Asian-centric. Asia now accounts for over 40% of global economic output, with China producing, importing or consuming the majority of commodities. While the fate of freight is intricately tied to the cargo that is being transported, it is therefore no surprise that SGX commands the majority of FFA and iron ore derivative market share, reflecting the ever growing importance of China in global trade flows.

In an increasingly uncertain world where dark geopolitical clouds of volatility loom on the horizon, fanned by black swan-type upheavals in regulatory changes with IMO2020, FFA hedging can only become more critical and effective. Just as pirates and unfriendly weather at sea once encouraged the introduction of insurance tools to manage physical cargo losses, FFAs today allow insurance against uncertainty in the cost of freight - indexed to rates published by the Baltic Exchange, the leading maritime and freight market information provider of shipping benchmarks.

2. Shipbroking Services

Shipbroking is the link between many facets of shipping transaction. Therefore, shipbrokers possess a huge amount of information related to ship sale and chartering transactions and can help in rapid delivery of ships. For a long time, London, as a traditional shipping centre, still holds a leading position in shipbroking services. In particular, its information resources and the wide network of brokerage companies have exhibited strong competitiveness. However, with the eastward shifting of the world’s shipping centres, second-tier shipping services in the Asian region, led by Singapore have also taken shape and are beginning to close the gap with London in terms of services. Meanwhile, Athens, being the hub of the Mediterranean region, also supports a considerable number of shipping brokerage companies.

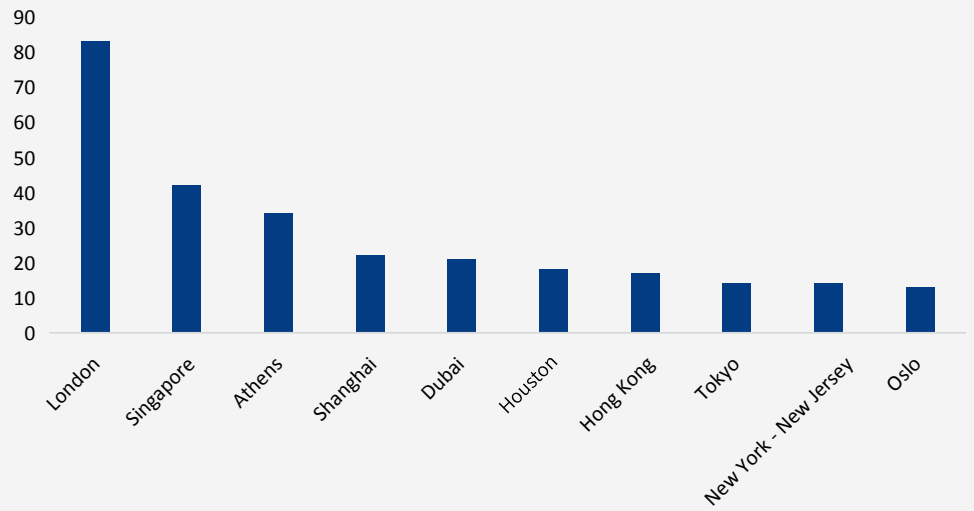


Figure 22 Top10 Cities With the Most Number of Shipbrokers

3. Maritime Legal Services

Maritime legal services tackle legal issues related to ship or property losses or share of losses due to some specific relationship between parties where such losses occur at sea or along navigational waterways. As a component of maritime legal service, international maritime arbitration is a high-end industry which portrays a country' s soft power in maritime trade.

(1) Maritime Arbitration

The geospatial distribution is basically stable. For a long time, Britain, as a veteran shipping centre, with its excellent geographical location and first-class service has become a spot where international maritime arbitration centres congregate, and has attracted a huge number of maritime arbitration practitioners. According to data from the London Arbitrators Association, Singapore Arbitrators Association and New York Arbitrators Association, London remains a very strong centre for maritime arbitration with 428 maritime arbitrators in the year 2018. It holds a solid position that is hard to catch up by its competitors in the short term.

(2) Maritime-Related Law Firms

Apart from maritime arbitration, maritime-related law firms also form an important part of the maritime legal services. According to data from Legal 500 and Chambers, based on the number of maritime-related law firms and partners in 2018, the top five port cities, by order of ranking, are: London, Singapore, New York-New Jersey, Shanghai and Hong Kong. These five shipping centres have strong competitive advantages in terms of maritime litigation resources.

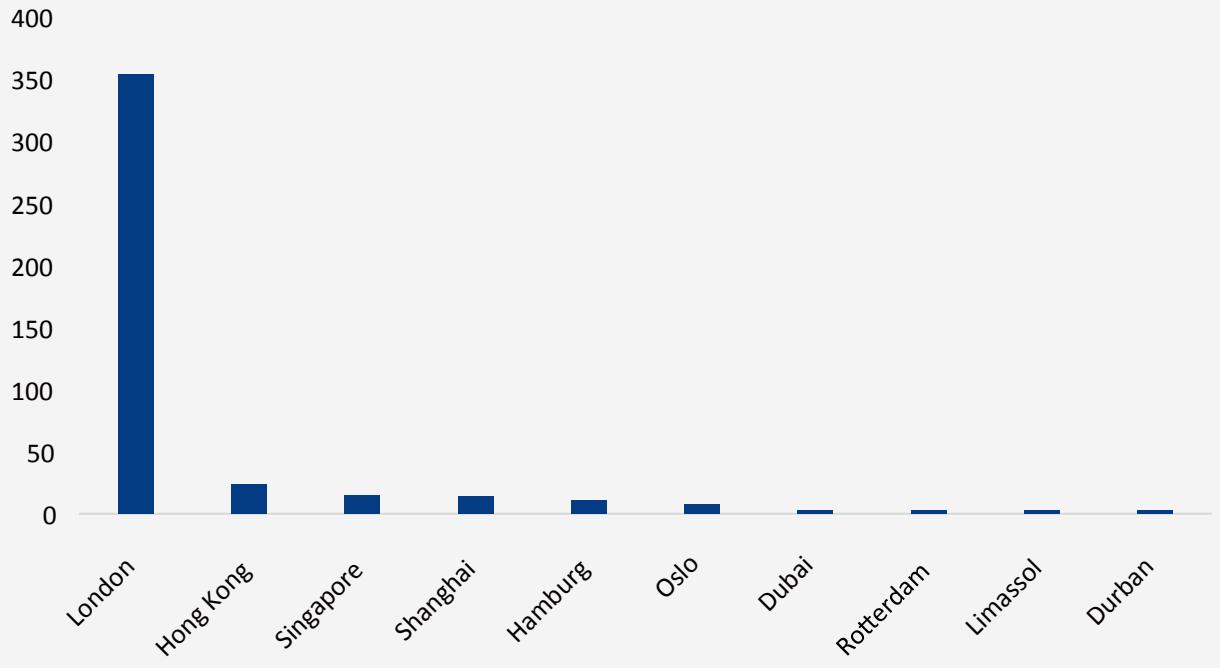


Figure 23 Top10 Cities by Number of Arbitrators

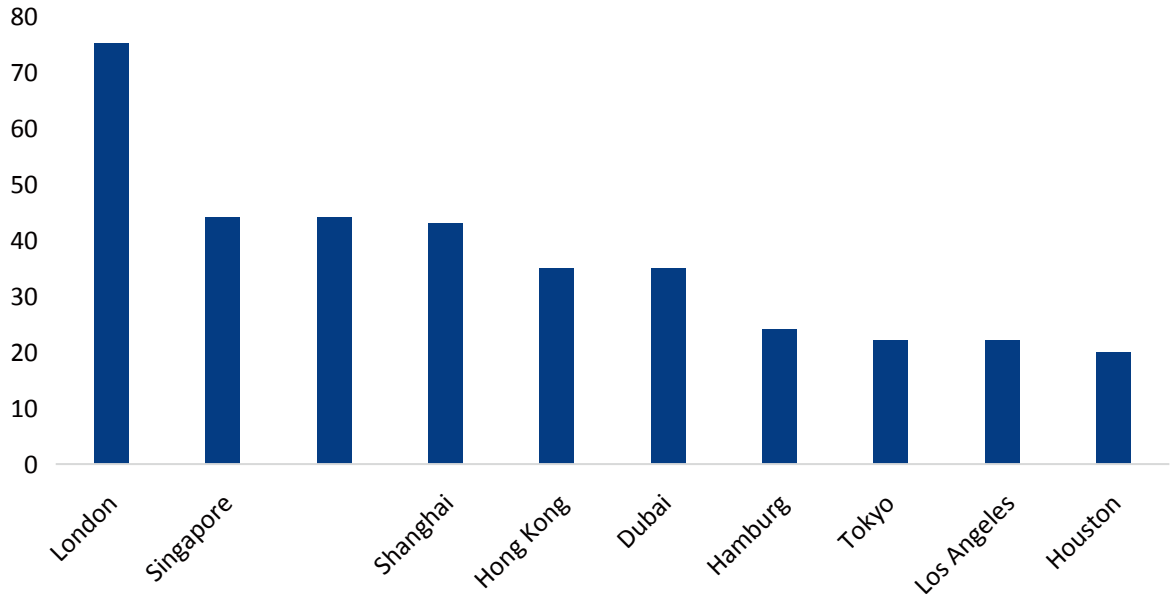


Figure 24 Top10 Cities by Number of Maritime-Related Law Firms (number)

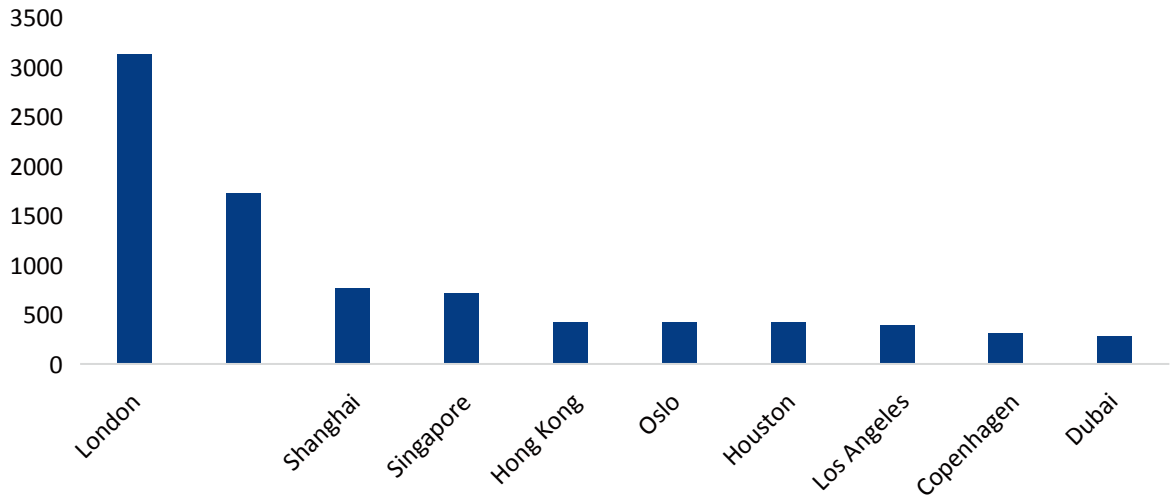


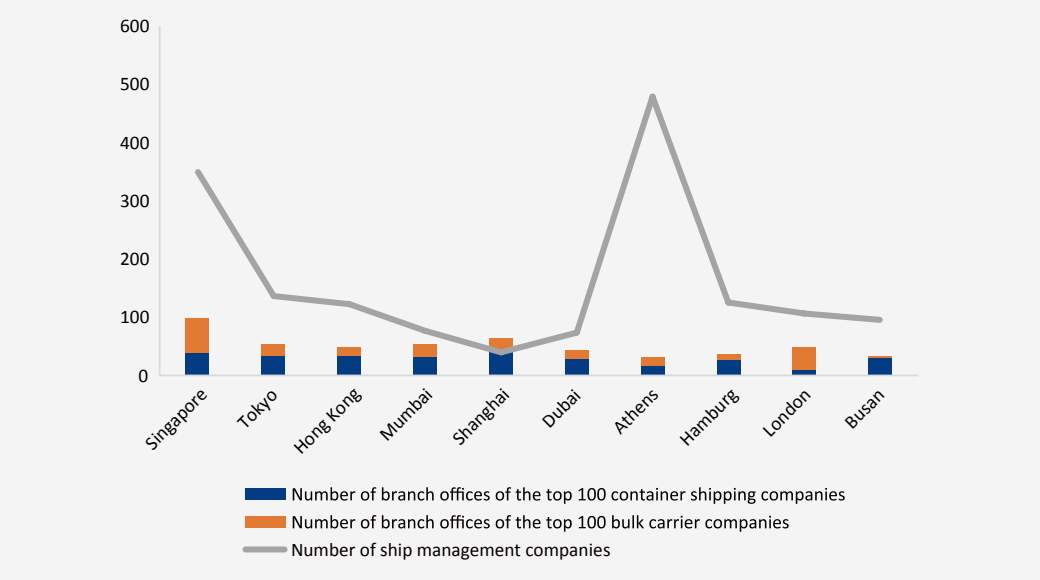
Figure 25 Top10 Cities by Number of Maritime-Related Law Partners (number)

4. Shipping Business Service

Shipping business service refers to ship operation and management services. A company may manage its own vessels or manage on behalf of third-party owners. The main indicators include the number of ship management companies operating in the port and the number of branch offices of the top 100 container shipping companies or bulk carrier companies.

The top ten shipping business service companies are mainly concentrated within the Asia-Pacific region. Most top 100 bulk carrier and container shipping companies have branch offices in Singapore. With 60 branch offices, Singapore houses the highest number of branch offices of the top 100 bulk carrier companies. The country also attracted about 40 top 100 container shipping companies to set up branch offices. On the other hand, with more than 40 branch offices, Shanghai houses the most branch offices of the top 100 container shipping companies. Athens has the highest number of ship management companies, or about 480 companies.

Figure 26 Top10 cities by Number of Shipping Business Services



Alternative Dispute Resolution for Maritime Dispute

From the perspective of "Commissioned Mediation" Practices

Partner of Jinghai Law Firm

Dai Yi

Since the introduction of the case registration system, the number of cases undertaken by the maritime court has increased tremendously. The nature of some maritime cases involves deep professional technicalities, complicated facts, multiple parties, and difficulty in evidence presentation. As such, there is increasing pressure on maritime courts in the trials of such cases.

However, litigation is not the only way to resolve maritime disputes. Many countries have already adopted the ADR (Alternative Dispute Resolution) method to deal with maritime disputes. A non-litigation dispute resolution method, ADR not only reduces litigation burden of the maritime court, but also helps to maintain personal relationships between disputing parties. This is a positive impact on the development of the judicial system. Referred to as the "Quasi-Judicial Model" in the United States, commissioned mediation mechanism is one form of ADR. The mediation is facilitated by a mediator registered with the court. The judge will abstain from the specific mediation process. If a dispute fails to be resolved through mediation, litigation procedures will proceed.

In recent years, the Shanghai High Court and the Shanghai Maritime Court have established collaboration with the relevant maritime arbitration institutions or mediation centres on commissioned mediation for eight types of maritime disputes, including marine cargo transportation disputes, marine insurance contact disputes and ship collision disputes.

Among the ship collision cases that I have handled – some of which involved foreign-related factors – the Shanghai Maritime Court has commissioned relevant agencies to conduct pre-litigation mediation upon the consent of the foreign parties. In August 2013, the collision between "Frontier Voyager" and "Haihongda" in the sea around the Yangtze River mouth resulted in the sinking of more than 10,000 tons of cargo carried by "Haihongda", amounting to a loss of 14 million Yuan. Another example was the collision of Chinese bulk cargo carrier "Ruining 1" and Liberian ship "DS KINGDOM" around the Shanghai waters in 2015 which resulted in a loss of 13 million Yuan. Litigation of such cases usually progresses very slowly, being hindered by the following factors: a large number of interested parties, controversial arguments on the proportion of collision liability and quantum of loss, unfamiliarity of the foreign parties with domestic proceedings, and complex procedures of notarisation. However, through commissioned mediation arranged by the court and the active cooperation of various parties, these disputes were resolved amicably. Moreover, the resolutions were achieved with effective reduction in litigation time and costs.

We found, through our practical experiences, that commissioned mediation has improved the efficiency of some major and difficult maritime disputes by avoiding long-drawn litigation. Firstly, the parties concerned have the freedom to elect international practices or industrial norms as their reference points to accelerate the resolution process. This will avoid complex litigation procedures such as facts identification and evidence presentation. Secondly, maritime dispute often involves highly specialised professional knowledge such as maritime navigation, ship construction and repair, as well as climate and weather. It is usually not possible for judges to master such professional knowledge. However, having a relevant maritime expert to preside over the mediation process will result in more satisfactory resolution for the disputes. It is worth mentioning that cases that have been successfully resolved through mediations commissioned by the maritime court are cheaper than litigation processes, and therefore represent cost saving for the parties concerned.

On the premise of fully respecting the concerned parties' freewill and autonomy, commissioned mediation, as a mechanism of ADR, can achieve rational distribution of judicial resources. It promotes mutual synergy between maritime court and commercial mediation and thus reduces litigation pressure on maritime court. For the parties concerned, it offers a more flexible, efficient and autonomous approach to dispute resolution. It is a worthy option.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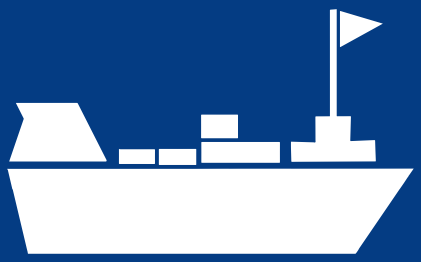
Xinhua-Baltic International Shipping Centre Development Index

Chapter 5

Development of Shipping Centers Along the 21st Century Maritime Silk Road



During his visit to Central Asia and Southeast Asia between September and October 2013, Chinese President Xi Jinping proposed a global initiative to build a "Silk Road Economic Belt" and a "21st Century Maritime Silk Road" (hereinafter referred to as "The One-Belt, One-Road"). The initiative has garnered world interest. The "21st Century Maritime Silk Road" is not merely a trade route, but also a path for economic development. In this respect, shipping, as a barometer of foreign trade, will be an important carrier for the realisation of the Maritime Silk Road. Therefore, by virtue of its natural advantages, the shipping industry should play a leading role to drive the cooperation and development of the other sectors and contribute to the construction of the Maritime Silk Road.

In building the Maritime Silk Road, the emphasis is on strengthening and promoting construction of port infrastructures, establishing land and water transport corridors, strengthening cooperation in port construction, increasing sea routes and shipping frequency and strengthening cooperation in digitisation of maritime logistic information. Under such new situation, the Maritime Silk Road will link up even more countries and regions, bringing them new opportunities and new economic partnerships. By creating demand, attracting the accumulation of high-end industrial elements for shipping industry and promoting complementary industrial supply chain amongst business enterprises within the economic belt, the problem of endogenous development within the enterprise can be resolved. This will help promote the global realisation of the value of high-tech innovations. While stimulating the development of the shipping industry, the Maritime Silk Road will also stimulate changes in the structure of industry and mode of economic growth in the port's hinterland to become a mega port and an international hub port.

Port Opportunities along the Maritime Silk Road

Mr Eric Jin,
Dr Tony Wu
BMT Asia Pacific

As one of the core components of OBOR, the Maritime Silk Road is aimed at investment and fostering collaboration and connectivity across Southeast Asia, Oceania, and North Africa, through several contiguous bodies of water – the South China Sea, the South Pacific Ocean, and the wider Indian Ocean area.

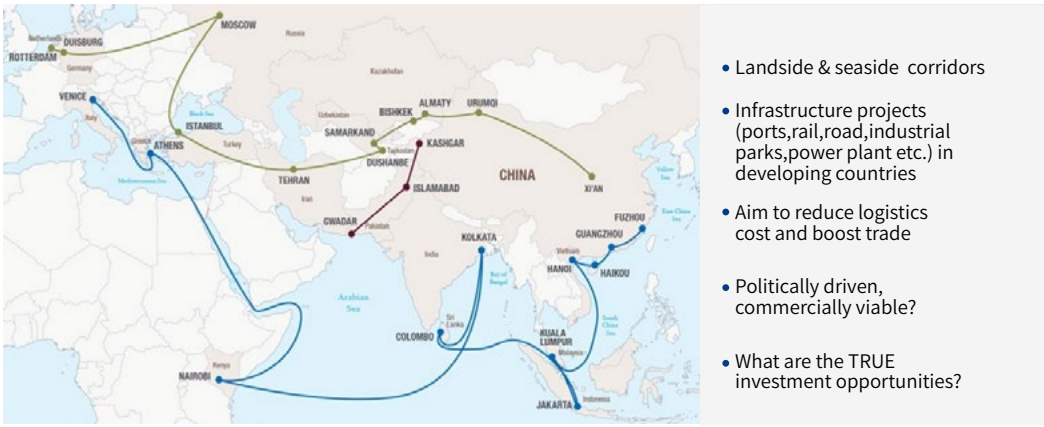


Figure 27
A Supply Driven Strategy

Increasing Cost of global supply chains and its long-run impacts on trades

International trade has been driven in the last 20 years by global supply chains seeking lower cost of sourcing, producing and delivering products. This has been energised by China joining the World Trade Organisation in 2001; and the subsequent development of its export-oriented industries.

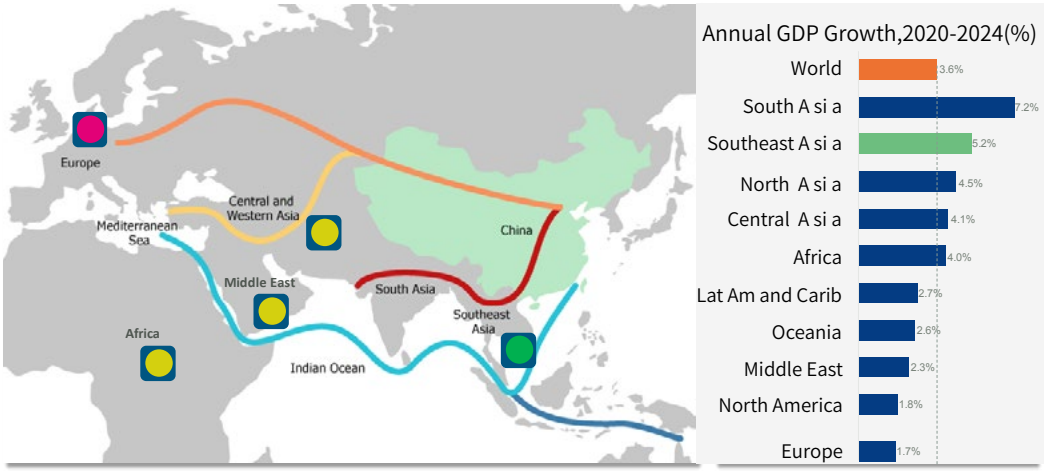


Figure 28
Asian economies are forecasted to outperform the rest of the world

Container shipping has contributed significantly in reducing logistics costs for cargo owners, with advances such as ultra-large transhipment hubs and ever-increasing vessel size. With 22,000 TEU+ mega vessels now operating, the question is: what will be the marginal benefit of further increasing the vessel size, and will these lead to further increases in globalisation? A flip-side to this is: is freight by sea now so cheap that further reductions make any difference?

Following the significant reduction in production and transportation costs over recent years, other costs are now emerging to become critical concerns for those companies with globalisation strategies. Such costs, including tariffs, taxes, are features of national policy, while stockouts, and in-transit inventory are precipitated by lengthy supply lines and lack of responsiveness between remote sites. These increasing costs lead to discussions from key international manufacturers re: sourcing and supplying locally or within a region. However, it's fair to say there is more talk than movement to date, and widescale onshoring back to Europe and America remains limited.

The increasing costs/risks of global supply chains, together with China's transition from export-oriented economy to consumption-based economy, has encouraged the development of intra-regional trades, in particular, intra-Asia trades. During the past 7 years (2011-2018), intra-regional container trade has grown by about 5.7% per year, comparing to 4.1% for Trans-Pacific trade and 2.8% for Far East-Europe trade (as shown in the following figure). In particular, intra-regional container trades (of which Intra Asia is a large component) is already four to five times bigger than the Far East-Europe or Trans-Pacific trade. Such long-term trends in global supply chains and global trade will have significant impacts in port and shipping industry.

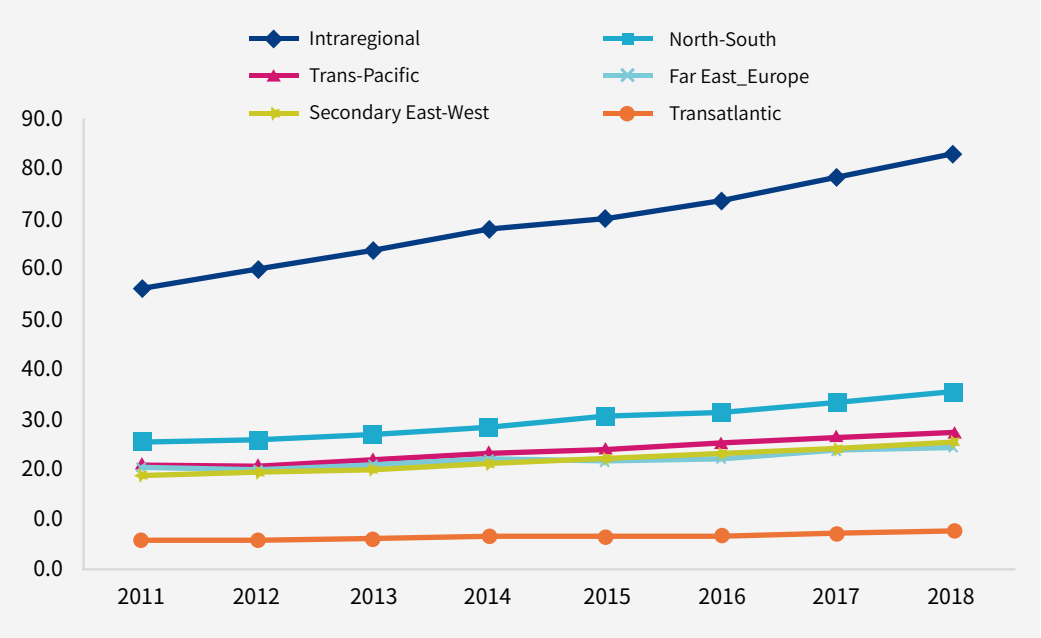


Figure 29 Container Trade Volumes by Category

Evolving from transhipment towards more direct calls at Asian ports

The hub-and-spoke system in container shipping has been developed to fit increasing cost reduction for the globalisation of global supply chains. Yet, the hub-and-spoke is more efficient for long-haul shipping than intra-regional shipping to gain the economy of scale of the very largest vessels plying east-west routes.

With the increase of intra-regional trade, there is more incentive for the shipping lines to provide more direct calls at different ports within regions, rather than relying on the traditional hub-and-spoke network.

For the cargo owners, direct calls of mother vessels will significantly reduce the logistics costs comparing to transhipment operations. Taking Sabah, East Malaysia as an example, due to the lack of direct calls foreign cargo in East Malaysia goods needs to be transhipped via regional hubs

like Port Klang, Singapore, and Hong Kong. The total shipping rate from Shanghai to Sabah could be 10 times higher than the shipping rate from Shanghai to Singapore.

In fact, in the past decade, there have been more direct calls at those rapidly developing Asian cities. The following figure shows the container shipping services between Far East and Southeast Asia provided by ten major shipping lines. Comparing to long haul services (e.g., from the Far East to the United States and EU), more direct calls are now provided to those relatively small ports.

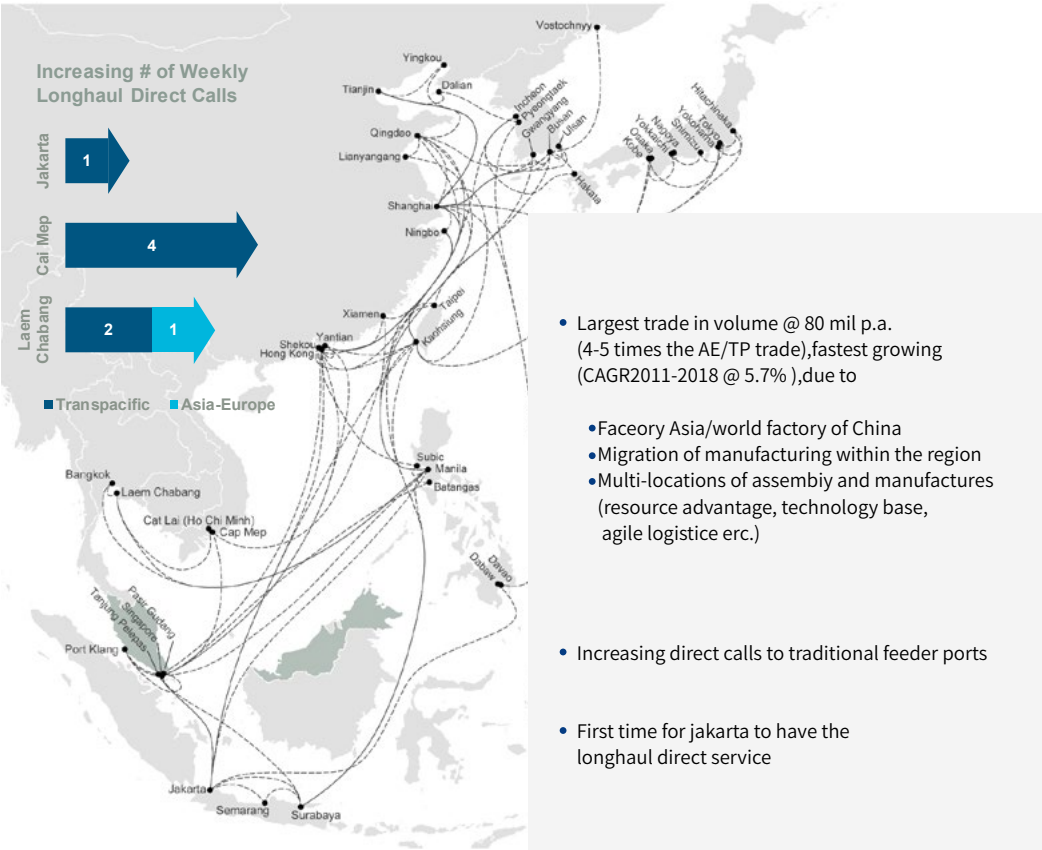


Figure 30
Trade Pattern
－Evolving from Transhipment towards Direct Calls

At the same time, for those traditional transhipment hubs for intra-Asia trades, there are risks for ports losing transhipment business in the long run. Notably, port operators in Hong Kong have suffered decreasing throughput as a result of weaker Intra-Asia and transhipment cargoes over recent years. Of course, local cabotage issues also disrupt this pattern - to the benefit of national shipping lines. But in a future shaped by increasing intra-regional trade the position for ports which rely significantly on transhipment may be less secure than previously.

Emerging opportunities for port development at Southeast Asia

Intrinsic population pressures and the aspirations of young urbanites will ensure that the economies of small-to-medium scaled developing cities in Southeast Asia is the future growth engine for the region. The development of greater direct calls for intra-Asia trades will be a component in assisting this growth, and opportunities exist for some traditional gateway ports in the region (with good prospects for hinterland economy development), to develop into more substantive port cities.

However, various factors need to be considered when quantifying the real potential of port opportunities in Southeast Asia, notably: Location.Capacity.Competition.

Key amongst these is location, location, location. Major shipping lines calculate the cost and benefit for adding each direct call to a new port. Additional merit is given to any ports which are located adjacent to existing main shipping lanes, rather than those ports far away from existing

shipping lanes. This explains one of the difficulties currently experienced by the new seaport in Haiphong, Vietnam, in attracting significant direct calls.

Besides the location issue, other challenges for the traditional gateway ports lie in the inadequate infrastructure to handle direct calls of mother vessels efficiently, including shallow water depth, short quay length, and lack of appropriate handling equipment, etc. Currently, most of the vessels deployed in Far East – Southeast Asia services are of the size ranging between 2,000 ~ 4,500 TEUs. However, these medium-sized vessels could still pose capacity issues for many Southeast Asian ports with few or no direct calls currently.

Competition is an increasing part of the port landscape in ASEAN, particularly along the Malacca straights, as ports in Singapore, Malaysia and Indonesia seek to expand off the back of transhipment opportunities, along with direct cargo. The economics of Ultra Large Container Ships limit the number of calls that can, or will be made, and the scope for additional major hubs may be questioned. Undoubtedly future mainline routings will be linked as much to carrier alliance preferences as much as the physical issues of location and capacity – an issue impacted by increasing carrier investments in ports themselves.

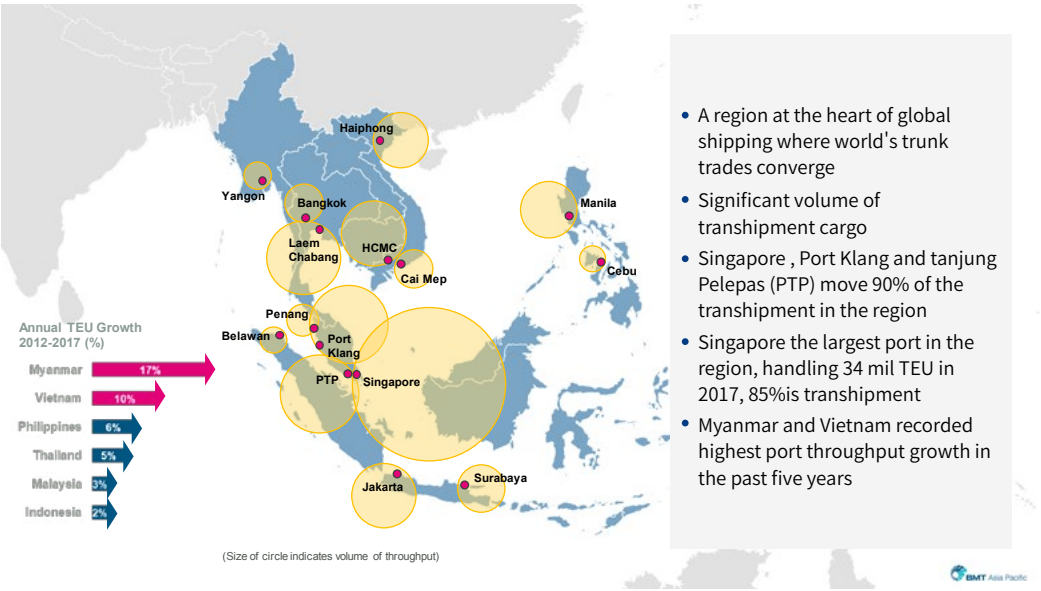


Figure 31
OBOR – Landscape of Asia Ports and their Growth

Conclusions

Globalisation is not dead. But intra-regional trades will see an increasing focus and the OBOR investments supply-driven strategy will strengthen this trend, particularly in ASEAN, by assisting smaller ports join the Big League and allow them to take their place at the table of Intra-Asia trade.

Ports with proximity to existing shipping lanes, and the ability to scale up port infrastructure will be the early winners, particularly if paired with investment from parties with links to carrier alliances, or the development of hinterland special economic zones.

However, a seat at the table does not guarantee that all ports will feast on the spoils of OBOR generated growth. Success will still be based on the age-old precepts of cargo demand, and adequate financial return for investors shall be based on a thorough and prudent analysis of key issues, including hinterland prospects, competition, technical issues and constraints, supportive policies and political and financial risks.

Prediction is very difficult, especially about the future, but what is clear is that OBOR is set to initiate an unprecedented level of development, but one in which the realities of economics will still apply, and sound investment must be supported by economic and engineering due diligence.

Accelerate the Development of China's International Shipping Centres

China's State Port-of-Entry Office

Zhu Zhen

Located on the western shore of the Pacific Ocean, China is a country at the eastern end of the Euro-Asia continent and with huge expanses of both terrestrial and water territories. Such is the impetus for equal emphasis in development of both land and sea transportation channels which enable China to become a centre for amalgamation of both terrestrial and marine civilisations. Given its dense distribution of ports and a high number of mega-ports, China is a huge marine transportation hub. It has more than 400 ports throughout the country, of which more than 2,400 berths can accommodate ships greater than 10,000 tons. On average, one can find one comprehensive mega-port with 10-million-ton capacity within a 500km distance. Currently, there are five major port clusters along China's coast: namely Bohai Bay region, Yangtze River Delta region, southeast coastal region, Pearl River Delta region and southwest coastal region. The various ports, serving as international shipping centres or global trading hubs, play an essential role in effectively promoting economic and trade cooperation, humanities exchange, as well as cross-border intercommunication between China and the world.

A Prosperous Country Economy Supports a Strong Shipping Development In recent years, major coastal ports, especially international shipping centre ports represented by Shanghai, Tianjin, Guangzhou, Xiamen and Dalian, have exploited their natural geographical locations and relatively more advanced facilities to continuously strengthen their practices including business professionalism, information technology, artificial intelligence and environmental protection, as well as strengthen their infrastructure with the construction of mega-ports and deep-water ports. There has been vigorous effort to lay out the global shipping routes in support of the "Belt and Road" initiative in order to deepen the cooperation between countries along the "Belt and Road" for better mutual benefit. This entails continuous effort to optimise port business environment and promote the development of high-value products and high-value-added shipping services. There are also continuous efforts to strengthen the capability in global shipping resource allocation and to further enhance the quality of services so as to achieve greater international influence and global competitiveness. Through such efforts, these ports have ascended to become the world's leading ports in terms of cargo throughput, container throughput, intelligent port construction and shipping service capability. Such efforts to promote the "Belt and Road" initiative and to drive innovation in the global shipping industry have enabled China to export its "Chinese wisdom" and to become the provider of "Chinese solutions" in the global shipping industry;

At present, the world is facing a major challenge unsurpassed in the last 100 years, and the global shipping industry is undergoing profound changes. Facing an era of new trends, new challenges and new historical opportunities, China should accelerate the development of its international shipping centres by exploiting its port resources and resource advantages and build regional shipping hubs in Asia and the Pacific. This will help strengthen the cooperation between ports and countries (regions) along the "Belt and Road", and hence consolidate the role of Chinese ports in the global shipping industry.

1. Accelerate the pace of integration between China's coastal port clusters to the "Belt and Road" initiative.

Firstly, allow market allocation of resources to influence the development of port clusters in order to strengthen the top-level design of the development of coastal port clusters. Meanwhile, coordinate the development of various port clusters in terms of functional positioning, geographical location, development potential, hinterland resources, industry distribution and cluster characteristics; and thereby promote constructive collaboration between the ports and industries.

Secondly, exploit the comparative advantages of coastal port clusters to further improve the standard of port infrastructure construction and expand the ports' collection and distribution functions. Guided by domestic and international shipping market practices, develop a modern port cluster that encompasses the following qualities: has prudent structure, clear hierarchy, complete functionality, smooth information flow, quality and safety, and is also accessible, efficient, civilised and environmentally-friendly. This enables the coastal ports to become important seaports and regional shipping hubs for the "Belt and Road" initiative.

Thirdly, increase the level of cooperation and collaboration between these coastal ports and foreign ports. This will help coordinate the transportation hubs between China and overseas shipping hubs, establish safe shipping routes between trading ports, and develop safe passages for global transportation networks.

2. Enhance the positioning of international shipping centres as shipping hubs in the construction of the "Belt and Road".

Firstly, greatly enhance the development of software, hardware and infrastructures of ports in Shanghai, Guangzhou, Dalian, Tianjin and Xiamen and their associated port clusters. Focusing on long-term development, we will fully exploit the advantages of multimodal transportation such as marine transit, sea-to-rail, land-to-sea, and land-to-air transportation modes. We will accelerate the development of harbour, port and free-trade facilities with extensions beyond the hinterland to build a transportation network that traverses all corners of China – a network that connects both domestic and international logistics channels by land, sea or air.

Secondly, while staying within the scope of law and regulation, fully exploit the policy benefits offered by pilot free-trade zones to promote the development

of new business models such as offshore finance, transaction trades and cross-border e-commerce, and to support the development of high-end shipping services such as international trade settlement, shipping insurance, shipping financing and security lending. The objective is to create centres with core shipping services and continuously improve the competitiveness of our international shipping centres.

3. Further enhance the global resource collection and allocation capabilities of our international shipping centres

Firstly, the actual expansion of the shipping industry chain should also allow for expansion of the whole industry chain including the upstream, midstream and downstream industrial players. This is to promote the development of the whole shipping service industry chain as an integrated industry and encourage resource sharing amongst shipping enterprises. It will also attract the concentration of key shipping resources and hence more efficient and scientific allocation of such resources.

Secondly, fully exploit the advantages of "Internet+" with the support of converging technologies such as mobile Internet, Internet of Things, smart Internet, big data and cloud computing to develop high-end services. This can be done by application of such modern technologies in port management, shipping services, collection and distribution systems and logistic systems.

Thirdly, strengthen the linkage between the port and its city to become a thoroughly integrated port-city that supports the "Shipping+" industry – or an amalgam of cross-border industries, capitals, e-commerce and cultural educations. This is to realise the dual-objective of comprehensive optimisation of the service supply chain of our international sipping centres and coordinated development of port-city industries.

Fourthly, place even higher emphasis on cultivating a good business environment to further attract cross-border investments and trade; and provide convenient transportation facilities to encourage mega shipping enterprises in attempts to capture the global shipping market (either through the act of "inviting partners to China" or "expanding overseas") and to establish their shipping networks worldwide.

4. Create a highly efficient and intelligent global collection and distribution system and logistics transportation system

Firstly, by actively learning from advanced international experience and benchmarking against advanced international standards, conduct collective research to promote the integration of land water and air transportation resources within your international shipping centres, with the aim to optimise the allocation of water, rail, land and air transport resources to help enhance the efficiency and service quality of transit and intermodal transportation, and thereby enhance the hub capability of the shipping centres.

Secondly, establish a multimodal transportation supervision system with international shipping centres as hubs. This will help to realise the organic connections of various modes of transportation. Through information system, intelligent applications, automation and standardisation, the supervision and control of multimodal transportation system is enhanced.

Thirdly, further enhance the application of technologies, information system and intelligent applications in international shipping centres. Actively promote the concept of "information exchange, mutual authentication, and mutual legal assistance", and speed up the establishment of "Single-Window Services" for international trade. This entails the establishment of a complete and full territorial port information sharing platform to provide a seamless exchange of custom clearance information between our international shipping centres and other ports. Such a system that allows for remote docking, data exchange and network sharing of regional customer clearance information will greatly improve the efficiency of clearance at international shipping centres.

5. Vigorously explore and establish free-trade ports with Chinese characteristics

Firstly, promote the establishment of free-trade ports. We must have an open mind, be pragmatic and ready to advance with time, so as to be proactive in seeking strategies in line with the "Belt and Road" initiative. We must move with the trend of the time to seek our position in this world and to actively seek innovations by learning from international experiences, practices and systems. With the above, we can then stand above the reality to face our future, explore and prospect fearlessly either through "inviting partners to China" or "expanding overseas", enhance our capability of resource collection and allocation, and focus on the unique characteristics of our industries. In this way, we will establish a comparative advantage globally and enhance our global competitiveness.

Secondly, establish free trade ports based on pilot free trade zones. Taking a leaf from the reform policy of "Simplified Administration, Decentralised Integration and Service Optimisation", we should boldly test and explore ideas to seek independent reformation, steadily advance the establishment of a legalized, globalized and convenient business environment offering fair, open, efficient and standardized market environment – with the aim to establish a new role model for reform in China.

Thirdly, explore and establish institutionalised mechanism connected to international rules. Promote the establishment of institutional innovation systems that demonstrate effective risk prevention and industrial leadership to collate policy resources and reformations. Explore the possibility of implementing the concept of "liberate the first-line ports, manage second-line ports, freedom within port zone and coordinated governance" for free-trade port supervision and services. This will create an environment with a higher level of openness, established legal environment, convenient business environment, free investments and trade, open and transparent rules, fair and efficient supervision, competitive advantages and controllable risks. Characteristically Chinese, it will be an international, intelligent and high standard free trade port with vast radiation belt. It will exemplify a higher level of reform in China.

Full Embracement of the Intelligent Port Era

Shanghai International Shipping Institute

Zhao Nan

The world today is undergoing an era of great transformation –the transition from industrial economy to digital economy. In this era, technology and information are the new factors and new engines for driving socio-economic development. International cooperation and the convergence of technologies will become a new normal for the development of various industries. The port industry is also facing a gamut of external environmental challenges such as diversified customer needs, green port movements and increased costs of business operations. Therefore, against the backdrop of continuously maturing information technology, Internet technology and automation technology, the port industry will undergo disruptive transformation in the areas of production technologies, operation modes and management methodologies. Driven by innovations, ports and the shipping industry will be undergoing a new phase of development that will catapult them to a new high at the top of the value chain.

At present, ports around the world have begun to explore deeper embedment of information technology into port business. Digitisation, automation and platform-based operations have now become the new standard characteristics of recent port developments.

(1) Innovation of port production technologies achieves more refined operations

In the past, port developments were largely extensive developments over-exploiting the shoreline and land resources. Port services were mainly based on traditional mega warehouses with large loading and unloading capacities. To realise the harmonious development between mankind and nature, such extensive production model is no longer viable to meet the requirements of the current trend of development. Supported by modern technologies, the port production model is transiting from extensive development to intensive and more refined development.

Ports began to focus more on production efficiency per unit of resource, and through technological transformation, to achieve more intensive use of existing port resources within their current space and resource constraints. Ports in both Singapore and Dubai have already explored this idea. In 2013, Singapore broached the concept of a new container port. Labelled as "The Next Generation Port", the concept entails a total redesign of port business operation with embedded technologies and workflows. The objective is to double the production efficiency per unit area of the port. At the same time, Cogent Holding, a service provider in logistic management service in Singapore, proposed a one-stop logistic hub, a uniquely designed rooftop container depot that is able to stack containers up to 15-high. In addition, the logistic hub deploys information technology to consolidate the operations of port warehouses and the container depot into a seamless workflow. The effect is real reduction in container transportation cycle time and idling time. Dubai (DP World) approached the idea of "space over plane" by transforming port storage system from original ground-based plane to 3-dimensional upward storage space. AMOVA, a joint entity formed by DP World and the SMS Group, has developed a new smart racking system which represented a breakthrough from the traditional stacking of containers directly on top of each other. With each container placed in a separate rack compartment, operation on one container will become independent of all the other containers and will no longer require the movement of other containers. This greatly increases the efficiency of moving containers in and out of the yard.

(2) Mechanical automation of ports improves production efficiency

With the rapid development of emerging technologies such as Big Data, cloud computing, virtual reality and artificial intelligence, fully automated equipment like unmanned vehicles, unmanned ships and drones are gradually gaining attention. As compared with traditional transportation equipment, unmanned transportation equipment can conduct autonomous navigation when equipped with accurate and timely information system. With sufficient embedded intelligence, such equipment can also make emergency decisions. This would fundamentally reduce any impact of transportation incidents caused by the human factor, reduce human labour intensity and reduce operation costs of businesses. Unmanned technologies include information technology, AI, simulation, autonomous control and sensory technology. Their application in the port will see the gradual replacement of manual work by machines.

In recent years, the typical trend of port automation is towards the development of unmanned and automated terminal operations. In China, Qingdao Port, Shanghai Port and Xiamen Port have all built automated container terminals; while Tianjin Port and Guangzhou Port are

exploring the development of automated terminals. However, there are still controversial arguments in comparative efficiency between automated terminals and traditional terminals. The operational efficiency of an automated terminal is mainly affected by instability of its automation system and lack of inter-operability between different systems. The 'rigid' characteristics of the automated terminal, inevitably constrain the terminal to respond "flexibly" to any unforeseen or unexpected events in the port. At present, shipping enterprises are actively improving their customers' experience of their products by introducing "schedule accuracy" guarantees. To do so, the port needs to support shipping enterprises with more "stable" services. Therefore, in the process of synergistically improving the stability of the supply chain, the port and shipping enterprises should, in addition to guaranteeing the loading and unloading efficiency of the terminal, strengthen the stability of port services and ensure the ability of the terminal in response to emergencies. This is especially so for the automated terminal or intelligent terminal. In this respect, it is even more pertinent to improve the "flexibility" of the automated terminal by increasing its emergency response scenarios during implementation. At the same time, every automated terminal should continue to push for technology optimization and improvement so as to reduce any inherent system "instability" and to strengthen the interoperability between different systems.

(3) Digital convergence of port supply chain optimises service level

Data is becoming a form of new "currency". Many companies are setting up data-centric enterprise platforms that integrate data with expert knowledge and turn them into service delivery architecture. Such digital platform enables companies to integrate their internal work processes, from end to end, with associated operational data, and allow such data to be accessed remotely from external ecosystem. Such integrated platform will greatly enhance the speed and quality of decision making across the industry. A port is a collection hub of information flow because the supply chain of port services encompasses numerous entities. Therefore, the transformation and upgrade of a port will require digitisation of various work flow processes of the port including both management and logistic processes. Digitisation is the basis for achieving a high level of integration to achieve better efficiency throughout the port supply chain.

Currently, many ports have begun to build regional logistic data exchange platforms centred on "logistic information and interconnected information systems". Such data exchange platform will not only include data from port enterprises but also data from other third-party platforms. For example, the ePort platform by China Merchant Group and the SmartPort intelligent port logistic platform by Hamburg Port are platform systems mainly initiated and developed by the ports concerned. Such platform systems often revolve around the relevant parties associated with the port itself and provide real-time participant data through its private and centrally-owned cloud. Such platforms are able to provide seamless end-to-end workflow management to improve logistic efficiency of the supply chain. Meanwhile, full logistic management platforms may also be provided by third-party enterprises. These platforms offer system application services to various customers including cargo owner, shipping companies, leasing companies, drivers, warehousing companies and consignees.

In addition, be it port enterprises or shipping enterprises, both are eagerly exploring blockchain technology to optimise their entire logistic chain services. From the perspective of port and shipping industry, the application of blockchain technology mainly covers two aspects: Firstly, the use of blockchain for cryptocurrency to avoid monitoring of trades with some countries that are facing trade or financial sanctions, such as the 300cubits booking deposit system, or for digital payments for transaction involving countries like Russia, Ukraine and Venezuela. Secondly, the use of blockchain for trade facilitation and product traceability. Examples are Tradelens by Maersk and Silsal by the port of Abu Dhabi. However, there are still many issues with the application of current blockchain technology. Firstly, there are still many controversies in the construction of the blockchain. The fundamental tenet of a blockchain is trust. It is a technology that seeks to build a "trusting" ecosystem between parties. But the current blockchain application development is often led by only a few leading enterprises, e.g. Tradelens jointly built by Maersk and IBM. How such leading companies maintain neutrality and accept other competitors is a very contentious issue. From the perspective of blockchain builder, the use of a blockchain will require the acceptance and integration of various participating logistic entities. Secondly, currently blockchain applications are still mainly used by its builder on a single-user basis. Therefore, the "chain" in blockchain technology has yet to be completed. In maritime logistics, there is a large number of players and mitigation factors. With participants holding differing node positions within the chain and possessing different data formats and standards, it is a herculean challenge to the builder of a palpable "blockchain". In actual operation, blockchain organisations will also need to establish a wide range of industry standards and technical agreements.

From the above discussion, we can see that global port logistics is undergoing transformation under the influence of information technology. However, there are still many difficulties and obstacles along the path of such transformations, and we still have a long way to go to truly achieve the concept of intelligent ports.

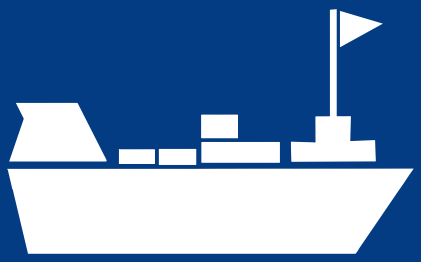
Xinhua-Baltic International Shipping Centre Development Index

6

Appendix

Appendix I :
Methodology for International
Shipping Centre Development Index

Appendix II:
Message from CEO
of the Baltic Exchange



Appendix I:Methodology for International Shipping Centre Development Index

1. The General Rationale

The research process for Xinhua-Baltic International Shipping Centre Development Index consists of 7 steps:

Step 1: Theoretical research on index: Collate and study relevant literature to achieve a comprehensive understanding of the theoretical foundation of international shipping centres and the current state of development. Conduct In-depth interviews with government organisations, university academia and professional experts to collate their expertise and suggestions on the rationale for selecting indicators and the methodology for index computation.

Step 2: Index system design: The Xinhua-Baltic International Shipping Centre Development Index system will be jointly developed by China Economic Information Service and the Baltic Exchange, which will be authenticated by an expert committee.

Step 3: Data collection and processing: Initial data for indicators will be collected through two channels: China Economic Information Service and the Baltic Exchange. This data will then go through a normalisation process to form the relevant indicator data.

Step 4: Index model construction and computation: Based on earlier theoretical research and in accordance with correlations between indicators, an index model will be constructed. Subsequently an index will be computed using the model.

Step 5: Index report writing: A report about the creation of the index will be produced under the guidance of the index expert committee.

Step 6: Organise an expert team to ascertain the scientific foundation of the research and confirm the final result.

Step 7: Announcement of index results.

2. Index System

Primary Tier		Secondary Tier
Name	Weight	Name
Port Factors (A1)	0.20	Container throughput (B1)
		Dry bulk cargo throughput (B2)
		Liquid bulk cargo throughput (B3)
		Number of cranes (B4)
		Total length of container berths (B5)
		Port draught (B6)
Shipping Services (A2)	0.50	Shipping Brokerage Service (B7)
		Ship engineering service (B8)
		Shipping business service (B9)
		Maritime legal service (B10)
		Shipping finance service (B11)
		Ship repair service (B12)
General Environment (A3)	0.30	Government transparency (B13)
		Extent of e-government and administration (B14)
		Economic freedom (B15)
		Customs tariff (B16)
		Ease of doing business index (B17)
		Logistics performance index (B18)

Table 4 Indicator system and associated weightage for Xinhua-Baltic International Shipping Centre

A1 Port Factors

This refers to infrastructures of the port city and the actual throughputs of various types of cargo.

A2 Shipping Services

This refers to the level of shipping services provided by the port city. This can be gauged by how the shipping centre capitalise on its services to portray its ability in the allocation of shipping resources globally.

A3 General Environment

This refers to the business and economic environment together with government policy measures to support the development of the port city.

B1 Container throughput

Container throughput is an important indicator of the size of the port. It refers to the number of containers passing through the boundary of the port via its waterway for loading or unloading within the reported period. Container throughput data used in this report is container count. The computation unit is “10,000 TEU”.

Source of data: China Economic Information Service Database

B2 Dry bulk cargo throughput

This refers to the quantity of dry bulk cargo passing through the boundary of the port via its waterway for loading or unloading within the reported period. The unit is “ton”.

Source of data: China Economic Information Service Database

B3 Liquid bulk cargo throughput

This refers to the quantity of liquid bulk cargo passing through the boundary of the port via its waterway for loading or unloading within the reported period. The unit is "ton".

Source of data: China Economic Information Service Database

B4 Number of cranes

Cranes are machinery for loading and unloading containers in the wharf area. Operating capacity of cranes can determine the cargo handling capacity of a wharf.

Source of data: Drewry

B5 Total length of container berths

Berths refer to locations within the port where ships can dock. A single location equipped with berthing facilities to accommodate a single ship is called a berth. The length of a berth is determined by the length of ships it plans to accommodate and the safety distance required for two adjacent ships. These include quayside berth, pontoon berth and anchorage berth.

Berthing facilities is an important indicator reflecting the ability of a port to accommodate berthing ships. It is one of the basis for measuring the size and capacity of the port. Total length of container berth refers to the actual length of berth available – including various types of fixed or floating wharf – for berthing of ships for loading and unloading of containers within the reported period. The unit of computation is "metre".

Source of data: Drewry

B6 Port draught

Draught of a ship refers to the maximum depth of the ship that is under the water line. Different ships have different draught. Moreover, the draught of a ship may even differ depending on its load and the salinity of water in the region. Port draught is an important indicator that reflects the deadweight of a ship that can be accommodated by the port. Port draughts in this report refers to water depth statistics of the deepest container berth in the port.

Source of data: Drewry

B7 Shipbroking Services

Characterised by its intermediary services, brokerage is the key services provided by shipping agencies. An important component of shipping services, shipbrokers provide professional agency, brokerage and consultancy services on a gamut of industries including transportation, insurance , financial and commerce, which facilitate shipping development.

In this report, shipping brokerage services will be assessed based on the distribution of the Baltic Exchange – Global Shipping Brokers Membership together with other factors.

Main source of data: The Baltic Exchange

B8 Ship engineering service

Ship engineering service enterprises are companies with marine engineering professionals having the ability to provide ship engineering technology and related services. The sector also provides training on basic theory and technical skills in seamanship and transportation that comply with relevant occupational certification by the authorities; as well as training of professional on advanced applied technologies to enable them to navigate vessels.

In this report, ship engineering service is assessed based on the number of shipping companies available in the port city together with other factors. Professional fields of ship engineering company include ship engineering, repairs, quantity surveying and ship classification.

Main source of data: International Association of Classification Societies (IACS)

B9 Shipping Business service

A shipping company may manage its own vessels or vessels commissioned by other owners. In this report, shipping business service consists mainly of the following three indicators: the number of ship management companies operating in the port city as published by the website of Lloyd's List, the number of branches of top 100 container shipping companies and top 100 bulk carrier companies, and in conjunction with other factors.

Main source of data: Lloyd's List

B10 Maritime legal service

In this report, the overall service level of maritime legal service will be assessed from the two perspectives of maritime arbitration service and total number of partners practicing in legal offices. Maritime arbitration refers to the agreed system whereby any dispute shall be arbitrated in an agreed arbitration institution in accordance with the arbitration agreement (terms) established before or after the dispute event.

In this report, maritime arbitration service is assessed based on the number of arbitrators located in international arbitration centres in London, Singapore and New York, and in conjunction with other factors. The number of partners in law firms is assessed based on the Legal 500 Law Firm Index or enquiry on the number of partners using the Chamber or websites of respective law firms, and in conjunction with other factors.

Main source of data: London Maritime Arbitrators Association, Singapore Institute of Arbitrators, Society of Maritime Arbitrators, Legal 500, Chambers

B11Shipping finance service

The scope of shipping finance service covers four areas: namely ship financing, capital settlement, maritime insurance and maritime financial derivatives.

Wherein, ship financing includes syndicate loans, debt capital market and equity capital market. Maritime insurance refers to a kind of insurance taken on cargo or ship against the potential risks of loss or unforeseen expenses during the sea journey. The types of maritime insurance include cargo insurance, ship insurance, freight and P&I insurance. Statistical collation by IUMI includes maritime insurance premiums for ship insurance, cargo insurance, maritime liability insurance and offshore energy insurance.

In this report, shipping insurance service is assessed based on maritime insurance expenses of the port city. To compute maritime insurance expenses of a city, first compute the sum of ship and cargo insurance premiums of each country, then distribute the total premium to each port city based on the port’s cargo throughput.

Source of data: Marine Money, International Union of Marine Insurance (IUMI)

B12Ship repair service

Ship repair service refers to regular repair and maintenance to keep a ship in good technical condition during its life time. Classified ships (see CCS, China Classification Society) must also be inspected regularly by the classification surveyor in order to maintain its classification. Ship repairs are categorised into the following five types: annual maintenance, overhaul, voyage repair, accident repair and retrofitting repair.

In this report, ship repair service is assessed based on the number and types of repair services (including full overhaul, ordinary repairs and emergency repairs) that can be handled by the port city in conjunction with other factors.

Ship repair can be categorised as follows:

A – Overhaul: Complete retrofitting or reconstruction in a well-equipped dock

B – Moderate overhaul: Complete retrofitting or reconstruction without the need for docking system

C – Ordinary repair: Small repair jobs that can be carried out by independent machine shops or factory

D – Emergency repair

N – None of the above.

Main source of data: United Nations Conference on Trade and Development

B13Government transparency

Government transparency is a concept about publicised rules, plans, processes and operations so that the general public understand the why, how, what and how much of policies. Transparency can ensure that the conduct of public officials, civil servants, administrators, company board members and businessmen are open and understandable. Reports can also be made against them so that they would be held accountable for their conduct. This is the most reliable way to prevent corruption and help increase our confidence towards this group of people who are closely linked to our future.

Source of data: Transparency International

B14Extent of e-government and administration

e-Government and administration refers to the government’s willingness and ability to implement information technology in the provision of public services. Ability, as used here, refers to the extent of support provided by the government towards national finance, infrastructure, human resources, management, administration and system function. The willingness to provide information and knowledge to empower its citizens is a measure of the government’s commitment.

Source of data: United Nations e-Government Development Database

B15Economic freedom

Economic freedom means each individual has the fundamental right to control his/her own labour and property. In a free economy and society, an individual is free to work to engage in production, consumption and investment in any way. The government will allow free movement of labour, capital and goods. The government will avoid applying excessive constraints on freedom while in the process of protecting and maintaining freedom itself.

Source of data: “Wall Street Journal” and The Heritage Foundation, Index of Economic Freedom Report

B16Custom tariff

Custom tariffs refer to the rate applicable to computation of tax on targeted taxable goods stipulated in custom regulations.

Source of data: “Wall Street Journal” and The Heritage Foundation, Index of Economic Freedom Report

B17Ease of Doing Business Index

Economies are ranked on their ease of doing business, from 1 to 189; 1 being the best. A higher rank means the regulatory environment is more conducive for doing business. The index is derived from simple averages of national ranking by percentage scores on 10 themes under doing business ranking by the World Bank.

Source of data: World Bank Database

B18Logistics performance index

Logistics performance index is a score that reflects the following logistics attributes of a country: The efficiency of customs clearance process; quality of trade and transport related infrastructures; the ease of arranging competitively priced shipments; quality of logistics services; ability to track and trace cargo; and the frequency with which shipment reaches the recipient within expected delivery schedule. The index ranges from 1 to 5; a higher score means better logistics performance. The data are derived from the Logistics Performance Index Survey, which is conducted by the World Bank in cooperation with academic institutions, international organisations, private enterprises and international logistic professionals.

Source of data: World Bank Database

3.Data Processing

Data for secondary indicators required for the Xinhua-Baltic International Shipping Centre Development Index are mainly sourced from authoritative organisations such as the Baltic Exchange, Drewry, and World Bank.

Due to the differing nature of various indicators (size, ranking, ratio, etc.), if the raw values of these indicators are used directly in analysis, then indicators with large quantitative values may weaken the effects of indicators with smaller quantitative values; thus resulting in unequal contribution of each indicator to the computation. To avoid such phenomenon, each indicator should be normalised – through relative processing to make its statistical variables dimensionless – before using it in index computation.

Divide the raw data into two categories: The first comprises indicators with score values ranging from 1 to 100. This category of indicators can be used directly for computation. The second category comprises indicators with absolute score values. These indicators will be normalised by applying the standard deviation approach on data distribution.

(1) Determining sample mean and standard deviation

Supposing that the data distributions of secondary indicators are all normal distributions, bootstrap resampling is applied to these samples. After 500 resampling, the mean value and standard deviation are computed from the normal distribution of each indicator.

$$mean_{l,m} = \frac{1}{a}\sum_{i=1}^{a}\bar{x}_{l,mi}, sd_{l,m} = \frac{1}{a-1}\sum_{i=1}^{a}(\bar{x}_{l,mi} - mean_{l,m})^2$$

Where, $m = 1,2,\cdots,6$, $m = 1,2,\cdots,6$, $a = 500$ is sample mean of each sampling of the m-th indicator, $a = 500$ =500 indicates a total of 500 resampling, $sa_{l,m}$ is the mean value obtained after bootstrapping the m-th secondary indicator, and $sd_{l,m}$ is the standard deviation obtained after bootstrapping the m=th secondary indicator.

(2) Computing the score for secondary indicators of sample cities

Based on the mean value and variance of each indicator, compute the indicator' s quantile score for each city.

The quantile score of the m-th indicator for the p-th city is computed with the following formula:

$$y_{l,mp} = \phi\left(\frac{x_{l,mp} - mean_{l,m}}{sd_{l,m}}\right)$$

Where, $y_{l,mp}$ is the quantile score of the m-th secondary indicator for the p-th city, $x_{l,mp}$ is the indicator value of the m-th secondary indicator for the p-th city, and $\phi(\ )$ is the distribution function of standard normal distribution.

4. Model Computation

(1) Design of weighting system

The design of the weighting system for the Xinhua-Baltic International Shipping Centre Development Index employs analytic hierarchy process (AHP algorithm).

The basic principle of AHP is to break down the problem into a hierarchical structure consisting of goals, sub-goals (guidelines), constraining criteria and departments to analyse the various factors. From the hierarchical structure, apply pair-wise comparison to determine the judgement matrix. Derive the components of the eigenvector corresponding to the largest eigenvalue of the matrix. These components represent the corresponding coefficients that will be used to compute the weight of each factor (degree of priority).

AHP algorithm can be broken down into the following 6 basic steps:

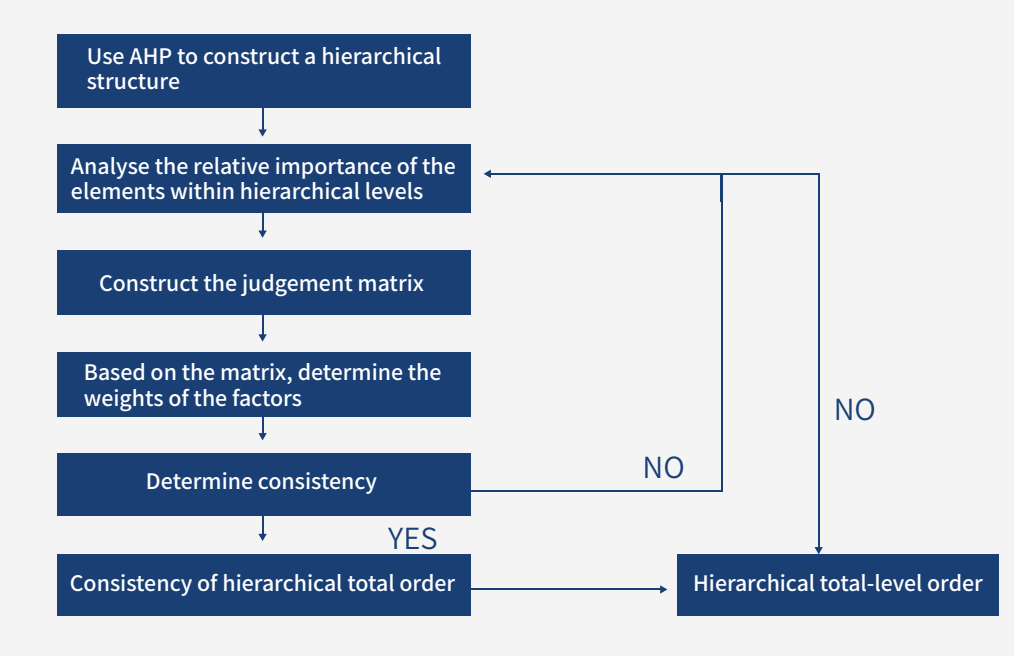


Figure 32
Basic processes of AHP algorithm

(1) Defining the problem: Clarify the problem in terms of scope, contributing factors and the relationship between different factors in order to have sufficient understanding of the problem.

(2) Construct a hierarchical structure: In this step, the factors are assigned to different hierarchical levels. It comprises the goal at the top level (goal level), several intermediate levels (guidelines levels) and the bottom level (solutions level). If an element is linked by all elements from the next level immediately below it, this element is said to have complete hierarchical relationship with the next level. If an element is linked by only some elements from the next level immediately below it, this element is said to have incomplete hierarchical relationship with the next level. A sub-level can be inserted between two hierarchical levels. This sub-level is subordinate to one element on the main level. The elements of the sub-level may be linked with the next level, but the sub-level may not constitute an independent level.

(3) Construct judgement matrix: This is the critical step in AHP. The judgement matrix defines the relative importance of relevant elements within a hierarchical level that is linked to an element in a higher level. For n indicators, $\{A_1, A_2, \cdots, A_n\}$, a_{ij} is the judgement value that signifies the importance of A_i relative to A_j. A_i is generally assigned a 5-grade rating scale of 1, 3, 5, 7, 9. A rating value of 1 means A_i and A_j are of equal importance; 3 means A_i is slightly more important than A_i; 5 means A_i is relatively more important than A_j; 7 means A_i is significantly more important than A_i; and 9 means A_i is extremely more important than A_j. The mid values of 2, 4, 6, 8 may also be used for intermediate judgement, especially when five grades become insufficient to represent the level of importance.

(4) Single-level order: The purpose of single-level order is to sort elements in the current level in order of their importance with respect to a linked element in a higher level. It is the basis for ordering all the elements in the current level in terms of importance with respect to an immediate higher level.

If we take the weight vector, $W = [w_1, w_2, \cdots, w_n]^T$, then we have:

AW=λW

If λ is the largest eigenvalue of A, then W is the eigenvector of A with respect to λ. Hence, single-level order process can be achieved by solving the judgement matrix for the values of λmax and its corresponding eigenvectors to obtain the relative weighting of this group of indicators.

In order to test the consistency of judgement matrix, we need to calculate its consistency index: $CI = \frac{\lambda_{\max} - n}{n-1}$

When CI =0, judgement matrix is complete consistency; conversely, a larger CI value indicates lesser consistency in judgement matrix.

(5) Hierarchical total-level order Using the results of single-level order of all the levels with respect to the same level, we can compute the weight values representing the importance of all elements in this level with respect to the immediate higher level. This is known as total-level order. Total-level order must be carried out layer by layer from top to bottom. For the highest level, its single-level order is the same as total-level order.

If total-level order for all elements $A_1, A_2, \cdots, A_m$ of a higher level is completed, and the corresponding weight values $a_1, a_2, \cdots, a_m$, a_j are obtained, $B_1, B_2, \cdots, B_n$ then the results of single-level order for corresponding to elements in the current level are $[b_1^j, b_2^j, \cdots, b_n^j]^T$. Now, if B_i is not linked to A_j , then b_i^j =0, and total-level order is achieved.

(6) Analyse consistency Similar to single-level order, we need to assess the consistency of the results of total-level order. Therefore, we perform consistency check as follows: $CI = \sum_{j=1}^{m} a_i CI_j \quad RI = \sum_{j=1}^{m} a_j RI_j \quad CR = \frac{CI}{RI}$

CI is the consistency index for total-level order; CI_j is the consistency index of judgement matrix RI corresponding to level B; RI is the random consistency index of judgement matrix RI_j corresponding to level B; and CR is the ratio of total-level order consistency index to random consistency index. Similarly, when CR<0.10, the consistency of computation results of total-level order is deemed to be satisfactory; otherwise, the judgement matrices for the current level need to be adjusted until satisfactory consistency is obtained for total-level order.

(2) Model for Index Computation

Specific computation formulae for the Xinhua-Baltic International Shipping Centre Development Index are as follows:

Use weighted sum method to compute the primary index:

$$y_{lp} = \sum_{m=1}^{l_m} y_{l,mp} * w_m = \sum_{m=1}^{l_m} \phi\left(\frac{x_{l,mp} - mean_{l,m}}{sd_{l,m}}\right) * w_m$$

Where, w_m are the weights of m secondary indicators; and l is the score of the l -th primary indicator of the p -th city.

The computation formula for comprehensive score of the sample cities is:

$$y_p = \sum_{l=1}^{3} y_{lp} * w_l = \sum_{l=1}^{3} \left(\sum_{m=1}^{l_m} y_{l,mp} * w_m\right) * w_l = \sum_{l=1}^{3} \left(\sum_{m=1}^{l_m} \phi\left(\frac{x_{l,mp} - mean_{l,m}}{sd_{l,m}}\right) * w_m\right) * w_l$$

Where, w_l is the weight of y_l -th primary indicator; and y_p is the score of the p -th city.

5.Survey Questionnaire

Dear experts,

Greetings! China Economic Information Service and the Baltic Exchange have embarked on a joint research to develop the Xinhua-Baltic International Shipping Centre Development Index. The aim is to produce an objective, impartial and scientific review and assessment of the competitiveness of cities with international shipping centres. The main purpose of this questionnaire is to obtain some fundamental information regarding weight assessment for analytic hierarchy process (AHP). Your response is of utmost importance to this research. Therefore, we sincerely seek your support to fill out the questionnaire carefully. Thank you for your support!

(a) Explanation for scoring

This questionnaire uses scoring rules based on the 1-9 scoring scale method of AHP:

1 means elements i are equally important;

3 means element i is slightly more important than element i ;

5 means element i is relatively more important than element j ;

7 means element j is significantly more important than element j ;

9 means element i is extremely more important than element i ;

The values 2, 4, 6, 8 may also be used as mid value judgement for 1-3, 3-5, 5-7, 7-9 respectively.

An example is shown below (vertical column represents element i , while horizontal row represents element j):

Technological innovation capability (A)	B_1	B_2	B_3
Innovative output capability (B1)	—	3	5
R&D capability (B2)	—	—	2
Innovation management capability (B3)	—	—	—

In the above table, the value 3 (2nd row and 3rd column) means that for Technology Innovation Capability (A) on the target level, Innovative Output Capability (B1) is slightly more important than R&D Capability B2).

(2) Scoring by experts

1. Scoring for primary indicators

Please fill in the value of importance between the primary indicators (A1-A3) with respect to the ultimate indicator (D). The shaded areas need not be filled (same for all tables below).

Xinhua-Baltic International Shipping Centre Development Index（D）	A_1	A_2	A_3
Port Factors（A1）	—		
Shipping Services（A2）	—	—	
General Environment（A3）	—	—	—

2. Scoring for secondary indicators

(a) Please fill in the value of importance between the secondary indicators (B1-B6) with respect to the primary indicator (A1).

Port Factors（A1）	B_1	B_2	B_3	B_4	B_5	B_6
Container throughput（B1）	—					
Dry bulk cargo throughput（B2）	—	—				
Liquid bulk cargo throughput（B3）	—	—	—			
Number of cranes（B4）	—	—	—	—		
Total length of container berths（B5）	—	—	—	—	—	
Port draught（B6）	—	—	—	—	—	—

(b) Please fill in the value of importance between the secondary indicators (B7-B12) with respect to the primary indicator (A2). Shaded areas need not be filled.

Shipping Services（A2）	B_1	B_2	B_3	B_4	B_5	B_6
Shipping brokerage service（B7）	—					
Ship engineering service（B8）	—	—				
Shipping business service（B9）	—	—	—			
Maritime legal service（B10）	—	—	—	—		
Shipping finance service（B11）	—	—	—	—	—	
Ship repair service（B12）	—	—	—	—	—	—

(c) Please fill in the value of importance between the secondary indicators (B13-B18) with respect to the primary indicator (A3). Shaded areas need not be filled.

General Environment（A3）	B_{13}	B_{14}	B_{15}	B_{16}	B_{17}	B_{18}
Government transparency（A3）	—					
Extent of e-government and administration（B14）	—	—				
Economic freedom（B15）	—	—	—			
Customs tariff（B16）	—	—	—	—		
Ease of doing business index（B17）	—	—	—	—	—	
Ease of doing business index（B17）	—	—	—	—	—	—

Appendix II

Message – Mark Jackson, Baltic Exchange Chief Executive

Mark Jackson
Chief Executive

We are delighted to present the sixth Xinhua–Baltic International Shipping Centre Development Index Report. Once again, it makes fascinating reading. It shows not only how competitive the field is, but also how standards are rising around the world. Dig into the detail and the reader will find analysis of the impact of the Belt and Road Initiative, the development of intra-Asia trade and in particular the all-important China-Japan-South Korea area which accounts for 70% of Asia’s GDP.

With an ever- increasing proportion of trade moving in, out of and around Asia, it is to be expected that the great port cities of Singapore, Hong Kong and Shanghai should see ever more maritime businesses attracted to them. Where cargo and shipowners go, business services follow.

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We hope that this report will help decision-makers in both the private and public spheres. Company executives can use this report to help them decide where best to focus their physical growth in the future. We hope that government policy makers will also find inspiration from this report to develop initiatives to attract maritime business to their cities and countries. A successful maritime and port city is a considerable asset to any economy.

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Development Index Report

Xinhua-Baltic International Shipping Centre Development Index

Report – Request for Comments

Description: In order to continuously improve on the quality of this report and provide even more objective evaluation, we sincerely wish to have your opinions and ideas. Please make your request and offer your invaluable suggestions. Thank you.

Name of Company: _____ Address: _____

Designation: _____ City: _____

Contact Tel No.: _____ Email: _____

Feedback: _____

_____

_____

Contact No.: 010-88052719、88052707

Email: zhishuzhongxin@xinhua.org

Please send your comments to: Xinhua Index Business Division, 15F, Block A, Global Financial Centre, No. 1A, Xuanwumen Outer Street, Beijing, 100052

China Economic Information Service

The Baltic Exchange

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