International port investment of Chinese port-related companies

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Abstract: The devolution of Chinese port governance since the 1990s has resulted in not only private sectors' involvement in Chinese port investment and development but also allowing local port groups and terminal operators to implement international strategies to expand their business. This paper overviews the current implementation on international port investment of these two types of Chinese port-related companies. By analysing 39 international port investment cases, this paper finds the belt and road initiative (BRI) may promote China's investment in foreign ports. In addition, four main investment modalities are adopted, i.e., acquisition, joint venture, concession and build-operate-transfer (BOT). The companies mainly form a partnership for investment, and some of the investment projects involve an integration of the development of ports, industrial parks and cities. Of notice is that some investment projects are through a public-private partnership (PPP) model, i.e., Chinese companies as private entities and public sectors in the host countries.

Keywords: port; China; public-private partnership; PPP; port investment; investment modalities; international shipping.

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1 Introduction

Historically, seaports are an important factor in the development of the national economy because they are gateways for imports and exports. As Professor Goss (1990a, p.218) states: "the economic functions of a seaport are to provide benefits to the original producers of the exports and the ultimate consumers of the imports passing through it." With the globalisation and development of logistics and supply chains, the seaport's role has been altered to integrate into manufacturing and distribution systems. Therefore, ports around the world have been endeavouring in improving seaports' economic efficiency since 1980s. Institutional reform of seaports, i.e., the restructuring of port operation and management has been the major strategy to ensure that users and customers benefit from competition and efficiency, thereby ensuring that economic benefits flow through the economy to consumers. For instance, privatisation has been an approach adopted by governments in many countries in past decades to improve the operational efficiency of public undertakings through competition and the management capability of port entities.

It is always a challenge for ports to assist their customers to improve their competitive positions due to the limitations of port capability and operations (PPIAF, 2007). Privatisation, either privatising operations or port entities, is a popular approach encouraging private sectors' greater participation in ports' operations and management to increase efficiency and effectiveness to meet customers' needs. The worldwide port privatisation experience indicates that port operation function has been devolved to the private sector so that the public/private model is to a large extent preferred in many countries. This type of arrangement is also known as the landlord approach (Goss, 1995; Lee and Lam, 2017). This has changed the role of public port authorities in managing ports and accordingly, the role of port authorities has tended to change to acting as a regulator and landowner. Goss (1990b, 1990c) discusses various ways in which the public and private sectors of ports can cooperate and provides management strategies for port authorities. While port authorities act in close co-operations with private sector companies, Goss (1995) suggests that public port authorities are still essential for some public interests, such as controlling property rights, planning, and efficiency through ensuring competition. However, the later trend of separating regulatory and business functions of port authorities has led to restructuring port authorities into public port companies or groups with more autonomy in managing ports. For example, the Shanghai International Port Group (SIPG) and the PSA Corporation at the Ports of Shanghai and Singapore respectively, they not only operate within their ports but also have various investments and businesses outside the ports domestically or internationally (Chen, 2009). Port authorities/companies now can extend their business across the border to increase their market shares and profits (Dooms et al., 2013).

China followed the worldwide port privatisation wave in 1990s after its Central Government's implementation of Open Door Policy in 1978 and entry into World Trade Organization (WTO) in 2001. As such, investors from China or other countries can enter the Chinese port market. Especially, After the Port Law of the People's Republic of China (hereafter 'Port Law') took effect in 2004, foreign investments in China's port industry was not simply allowed, but actively encouraged. The mode of port privatisation adopted was joint venture, attracting foreign firms or international financial institutions as private sectors involved in Chinese ports' construction and operation. The joint venture approach has resulted in not only a rapid expansion of infrastructure and service capacity in major Chinese ports but also accumulated expertise and capability of port operation and construction for the port-related industries.

With the expertise and capability accumulated through port privatisation, Chinese port-related companies are encouraged to expand their international business. In addition, multiple internal and external driving factors promote their overseas port investment. For internal factors, port governance in China has evolved with 'new rules, procedures, functions and mandates added into existing institutions and institutional arrangements' in the past decades [Notteboom and Yang, (2017), p.194]. In addition to the abovementioned Open Door Policy and WTO entry, the decentralisation of port governance in 2002 led to a shift of decision-making power of port activities from the central government to local governments. Under the Port Law and the Rules on Port Operation and Management, the government introduced a modern corporate system into the port industry and limited government's intervention in port operations and management (Chen, 2009; Lee and Flynn, 2011; Sislioglu et al., 2018).

The system replaced the original port authorities of major international ports with a port administration bureau and a corporatised port business entity (i.e., local port group) to separate the administrative and corporate functions, which were previously handled by the same port authority (Chen, 2009; Xu and Chin, 2012). The latter form of organisation is simply a pure business entity, engaging in the open market, as well as in competition and cooperation with other business entities. This decentralisation and corporatisation brought in the localisation and economic benefits to ports. Port companies and local governments have their respective motivations to invest. Port companies, driven by the pursuit of profits, intend to gain more market shares through investments, while local governments are driven by social benefits or performances in their governance. Local governments encourage port companies to conduct investments and maximise contributions of ports to the local economy (Wu et al., 2016). As mentioned earlier, such a corporatised port company/group can play an entrepreneur role and expand its business to other ports domestically or internationally. The recent national policy of the 13th 'five-year' plan and the Belt and Road Initiative (BRI) have further promoted a two-way opening-up strategy for the Chinese port industry, i.e., attracting foreign investments to Chinese ports and Chinese port and terminal operators investing overseas (Notteboom and Yang, 2017). Externally, many countries, either developing or developed countries, encourage private sectors' investment including foreign partnership in ports, because of various reasons such as budgetary issue, skill and knowledge shortage. Taking such opportunities, Chinese terminal operators and local port groups have been actively involved in overseas port investments. For example, China Merchants Port (CMPort) and Cosco Shipping Ports are as terminal operators and Guangxi Beibu Gulf Port Group and SIPG are as local port groups.

The devolution of port governance structure in China has changed the role of relevant port actors, which encourages international business expansion of Chinese port companies and terminal operators. Currently there is limited research on this topic. The existing few studies, mainly in Chinese, address the drivers for investment, key actors involved, modes/strategies adopted and relevant risks. Zhang (2014) presents four modes of foreign port investment, i.e., joint venture, merger and acquisition, BOT and concession, using few cases undertaken by Cosco, China Shipping and China Merchants Holdings International (CMHI). Xie et al. (2017) analyse the political, operational and legal risks associated with the investment. Liu (2017) indicates three driving forces for foreign port investment of Chinese companies, i.e., the BRI, liquidity shortage of foreign port assets and supply-side reform of Chinese port companies, using some cases undertaken by Cosco Shipping Group, CMPort and local port groups. From the international port cooperation perspective, Huo et al. (2018) conclude two modes of international port cooperation by Chinese port-related companies, i.e., investment holding or acquisition and strategic alliance. Liu et al. (2018) discuss the cooperation for disaster prevention and strategic investment for multiple ports.

Based on the discussion above, it is the authors' interest to explore how the Chinese port companies and terminal operators take adventure in overseas investments. The purpose of this paper is to analyse most international port investments, to the best of the authors' knowledge, undertaken by Chinese local port groups and major terminal operators. It aims to categorise the primary business investing overseas ports, identify geographic locations of investments, analyse the investing modalities, and provide managerial implications for the port industry. Secondary data of international port investment cases used for the analysis were collected through searching a large amount of recent news, websites, presses and publications of local port groups and terminal operators. The search obtained nearly all international port investment projects of Chinese port-related companies, approximately 39 international port projects invested by the two major types of port business between 2003 and 2017, presented in Section 2.

This paper consists five sections. Following this introduction section, Section 2 discusses the current international investment cases undertaken by the major two groups of Chinese port enterprises. Section 3 analyses the investment modalities. Section 4 discusses key findings, and Section 5 concludes the paper.

2 International port investment cases of Chinese port-related companies

Among the 39 cases of international port investment, 29 cases were undertaken by port terminal operators, while ten cases by local port groups. Figure 1 shows the locations of those ports invested, covering six continents including 26 countries. The details of the investment are shown in Tables 2, 5 and 6 and discussed in this section.

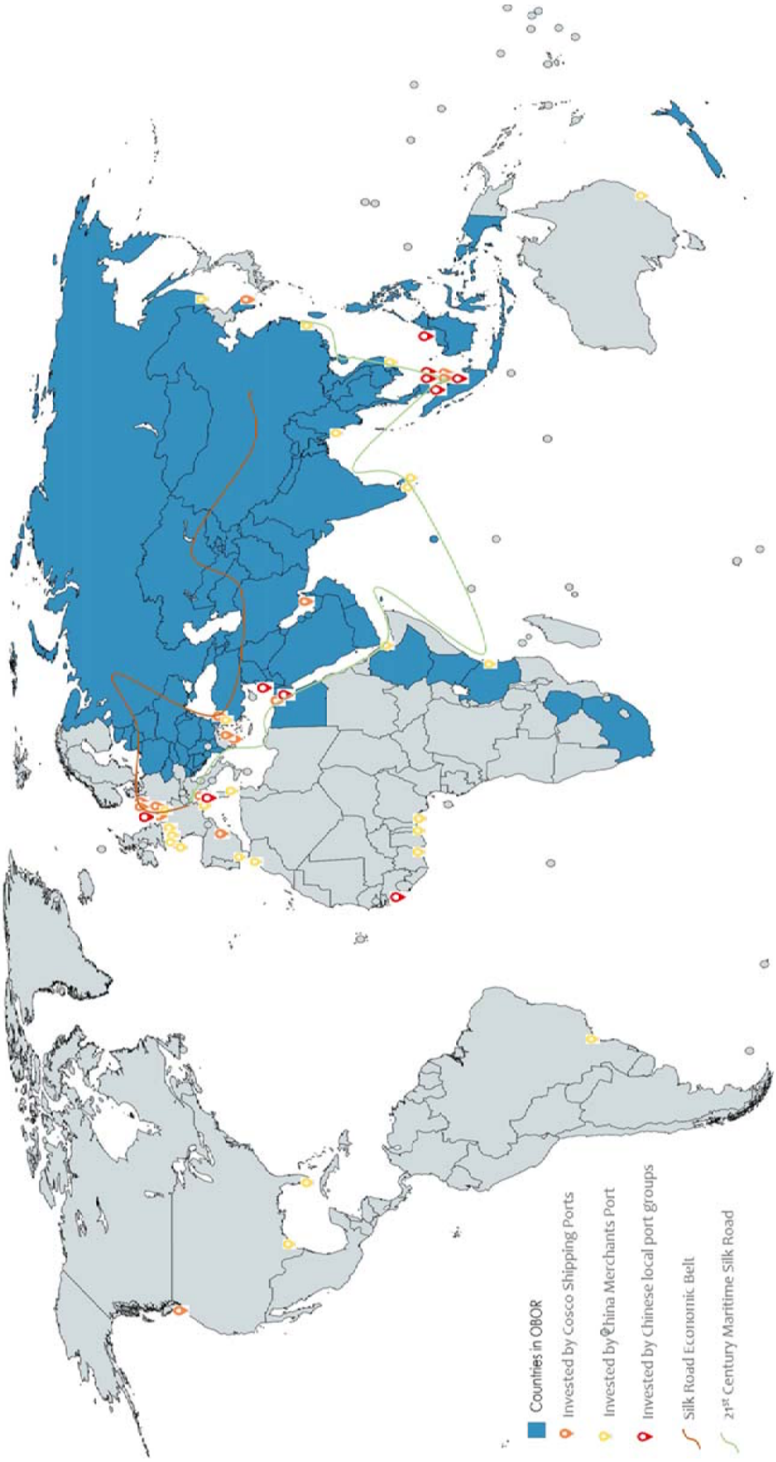
2.1 Port terminal operators

Cosco Shipping Ports and CMPort are the major Chinese port terminal operators conducting international port investment. Below sections present each company's profile and discuss overseas investment projects.

2.1.1 Cosco shipping ports

Cosco Shipping Ports, renamed from Cosco Pacific on 22nd July 2016, conducts the business in port operation within the Cosco Shipping Group. In March 2016, it was successfully transformed into a pure terminal operator with the acquisition of China Shipping Port Development Co., Ltd and the sale of Florens Container Holding Co., Ltd, which operates container leasing, management and sales business. The terminal business covers five coastal port clusters in mainland China, Hong Kong, Taiwan and foreign countries. By 31st December 2016, it operated and managed 180 berths in 30 ports around the world, including 158 container berths, with an annual capacity of about 97.25 million TEU. In the first half of 2017, the overseas business accounted for 21.3% of the company's total throughput, an increase of 4.3% compared with 17.0% at the same period in 2016. Meanwhile, the container throughput was 8,880,942 TEU, a 39.8% increase from 6,351,603 TEU at the same period in 2016 (see Table 1) (Cosco Shipping Ports, 2017). The overseas port business has become a new profit growth area of the company.

Figure 1 Locations of foreign ports invested by Chinese port-related companies (see online version for colours)



Source: Drawn by authors based on Sections 2.1 and 2.2

As shown in Table 2, six overseas investment projects were carried out by Cosco Shipping Ports during 2003–2017. Cosco Shipping Ports started overseas investment in 2003, when it was Cosco Pacific. It formed the joint venture company with PSA, namely Cosco-PSA Terminal Pte Ltd (CPT) with a 49% stake and PSA 51%. The joint company operates two berths at Pasir Panjang Terminal. Since then, Cosco Shipping Ports has actively targeted international investment in ports and terminals, such as at the Port of Antwerp, the Euromax Terminal in Maasvlakte at the port of Rotterdam, Piraeus port in Greece, Suez Canal Container Terminal, Port of Seattle, Port of Zeebrugge, Kumport Terminal in Istanbul, and Busan Port in South Korea. In addition to the co-investment through CPT in three new mega berths at the Pasir Panjang Terminal in 2016, Cosco Shipping Ports' most recent investment include acquiring 67% shares of Piraeus Container Terminal in Greece in 2016; investing Khalifa Port Container Terminal 2 in Abu Dhabi in September 2016; acquiring more shares in Euromax Terminal Rotterdam from 12.5% to 47.5% in 2016; acquiring more shares from 24% to 100% of APM Terminals Zeebrugge NV (APMTZ) in 2017; and acquiring 51% stake of Noatum Port Holding (NPH) in Spain in 2017. The recent deals further expand the footprint of overseas business and increase the distribution of terminals in the Middle East, Mediterranean and Europe.

Table 1 Container throughput volume of Cosco Shipping Ports in the first half of 2017

Areas	*Regions/terminals*	*Throughput (in thousand TEU)*	*Year-on-year growth rate*	*Percentage of total throughput*
Domestic terminals	Bohai Rim	7,629.8	2.7%	18.26%
	Yangtze River Delta	9,759.4	4.9%	23.36%
	Southeast Coast	2,328.9	10.1%	5.57%
	Pearl River Delta	12,570.4	8.2%	30.09%
	Southwest Coast	611.3	15.2%	1.46%
Overseas terminals	Piraeus Terminal	1,753.7	3.8%	4.20%
	Suez Canal Terminal	1,357.3	9.0%	3.25%
	Kumport Terminal	413.3	12.6%	0.99%
	Antwerp Terminal	1,034.9	1.6%	2.48%
	Zeebrugge Terminal	149.4	-15.6%	0.36%
	Cosco-PSA Terminal	975.7	12.0%	2.34%
	Busan Terminal	1,744.8	87.6%	4.18%
	Seattle Terminal	88.2	65.3%	0.21%
	Euromax Terminal	1,349.9	n.a.	3.23%
	Reefer Terminal	13.8	n.a.	0.03%
	Total throughput of overseas terminals	8,880.9	39.8%	21.26%
Total throughput of domestic and overseas terminals		41,780.9	11.8%	100%

Source: Authors' compilation based on information from Cosco Shipping Ports website

Table 2 International port investment of Cosco Shipping Ports

Foreign port	*Year*	*International port investment project*	*Region/country*	*Share*	*Modality*
Zeebrugge Terminal	2017	Completed the acquisition of APM Terminals' 76% majority shareholding on 30 November 2017 for APM Terminals Zeebrugge container terminal. The acquisition brings Cosco Shipping Ports' shareholding in the container terminal to 100%. The terminal was renamed CSP Zeebrugge Terminal NV.	Europe Belgium	100%	Acquisition
	2014	Acquired 24% stake of APM Terminals Zeebrugge NV (APMTZ) in Belgium.	Europe Belgium	24%	Acquisition
Noatum port	2017	Took a 51% of the shares of Noatum Port Holdings, S.L.U. (NPH) paying EUR203.49 million. Major assets of NPH include Noatum Container Terminal Valencia (NCTV), Noatum Container Terminal Bilbao (NCTB) and two rail yard companies, namely Conterail Madrid and Noatum Rail Terminal Zaragoza (NRTZ).	Europe Spain	51%	Acquisition
Reefer Terminal S.P.A	2016	Acquired 40% stake of Vado Holding B.V from APM Terminals with about EUR 53 million.	Europe Italy	40%	Acquisition
Abu Dhabi Khalifa Port	2016	Signed a 35-year concession agreement of Khalifa Port Container Terminal 2 with Abu Dhabi Ports, established the joint venture company with the controlling stake.	Middle East United Arab Emirates	90%	Concession (PPP)
Euromax Terminal	2016	Acquired 35% stake of Euromax Terminal Rotterdam owned by Europe Container Terminals (ECT) on May 11, 2016, paying EUR125 million, owned 47.5% stake adding the 12.5% share owned in 2006.	Europe Netherlands	47.5%	Acquisition
	2006	ECT and CKYH (Cosco Pacific, 'K' Line, Yang Ming and Hanjin) have entered a Memorandum of Understanding (MoU) to jointly construct, develop and operate Euromax Terminal in Maasvlakte at the port of Rotterdam in the Netherlands. ECT held 51% stake of the joint venture, with 49% stake held by CKYH (12.5% each party).	Europe Netherlands	12.5%	Joint venture
Piraeus port	2016	Acquired 51% stake of Piraeus port paying EUR280.5 million. Another EUR88 million will be paid within five years for the remaining 16% stake.	Europe Greece	67%	Acquisition (PPP)
	2008	Acquired the 35 years franchise of number 2 and number 3 container terminals of Piraeus port.	Europe Greece	—	Concession (PPP)

Note: '—' denotes unknown data.

Source: Authors' compilation based on a wide range of sources

Table 2 International port investment of Cosco Shipping Ports (continued)

Foreign port	*Year*	*International port investment project*	*Region/country*	*Share*	*Modality*
Cosco-PSA Terminal (CPT)	2016	Signed the cooperation agreement on co-investment in three new mega berths at the phases 3 and 4 expansions of the Pasir Panjang Terminal in Singapore with PSA through the joint venture company – CPT.	Southeast Asia Singapore	—	—
	2003	Established the joint venture company – CPT (51% stake held by PSA, 49% stake held by Cosco Pacific) to jointly operate two berths at Pasir Panjang Terminal.	Southeast Asia Singapore	49%	Joint venture
Busan Port	2015	Signed the share purchase agreement with CJ Korea Express and acquired a 20% stake of Korea Express Busan Container Terminal of Busan Port in South Korea to become the second largest shareholder.	Far East South Korea	20%	Acquisition
Kumport Terminal	2015	Formed a consortium with CMPort and China Investment Corporation – Capital Corporation (CIC Capital) to acquire 65% stake of Kumport terminal in Istanbul, Turkey paying USD940 million in September 2015. Three companies had equity stakes of 40%, 40% and 20% respectively in the consortium.	Eurasia Turkey	26%	Acquisition
SSA Terminals (Seattle)	2008	Established the joint venture company – SSA Terminals (Seattle) LLC (33.33% stake of each party) with SSA and Matson Navigation to lease numbers 25, 28, 30 terminals from Seattle Port Authority.	North America USA	33.33%	Concession (PPP)
Suez Canal Container Terminal	2007	Acquired 20% stake of Suez Canal Container Terminal S.A.E. owned by Egyptian International Container Terminal S.A. as a subsidiary of Maersk in November 2007.	Africa Egypt	20%	Acquisition
Antwerp port	2004	Acquired 25% stake of Antwerp port in Belgium from P&O Ports (acquisition by Maersk Group) and obtained the port operation rights.	Europe Belgium	25%	Acquisition

Note: '—' denotes unknown data.

Source: Authors' compilation based on a wide range of sources

Table 3 Global terminal operators' investment between 2013 and 2017

Company	*2013 Number of port/terminal*	*2017 Number of port/terminal*	*% of increase*
PSA	27	29	7.4%
APM	72	78	8.3%
HPH	51*	52	1.9%
DP World	65	78	20%
Cosco Shipping Ports	6	12	100%

Note: *2010 data.

Source: APM Terminals (2014, 2018); DP World (2014, 2018); Hutchison Ports (2018); PSA International (2014, 2017)

The following four characteristics are found regarding the international port investment undertaken by Cosco Shipping Ports.

Firstly, the company adopted a global strategy with the investment in ports located in Europe, Asia and North America, along with main routes of the global trade. These ports have become the ports of call for Cosco Shipping Lines and its shipping alliance. It is expected that investing these foreign ports would bring more shipping demand for Cosco Shipping and enhance its shipping business.

Secondly, the investment mainly focuses on the operation of existing ports (i.e., brownfield) rather than greenfield. Therefore, the main investment modes, such as joint venture, acquisition and concession, are mostly adopted (ten out of 16 projects).

Thirdly, there are four investment projects extended from existing investments, i.e., acquiring more shares of APMTZ from 24% in 2014 to 100% in 2017, Euromax Terminal Rotterdam from 12.5% in 2006 to 47.5% in 2016, 67% shares of Piraeus Container Terminal in 2016 on the basis of a 35-year concession it received in 2008, and co-investment in three new mega berths at the Pasir Panjang Terminal in 2016 through the joint venture company CPT, formed with PSA in 2003.

Fourthly, ten out of 16 investment projects have occurred since 2013 when the BRI was initiated. The BRI might promote the company's overseas investment, along with the company's rapid business development strategy. When looking at the investments of four major global terminal operators during 2013–2017, i.e., PSA International, Hutchison Ports (HPH), APM Terminals and DP World as in Table 3, they did increase in their global investment at different extents but were not as significant as that by Cosco Shipping Ports. The increased investment in terms of the number of terminals ranged from 1.9% (HPH) to 20% (DP World), while Cosco Shipping Ports increased by 100%. Considering the continuous uncertainty of the shipping market, slowdown in demand and increased risks in investment, global operators have become more cautious in new port projects (PSA International, 2014). On the contrary, Cosco Shipping Ports expanded its global presence very quickly after 2013. It shows that Cosco Shipping Ports attempted to take advantage in the integration of the global port industry due to the global economic downturn, with the stimulus of BRI strongly supported by the government.

2.1.2 China merchants port

CMPort, renamed from CMHI in 2016, is a global terminal operator owned by China Merchants Group. It has a port network portfolio covering five continents, 17 countries and regions, and 32 ports by December 2017. It has initially formed an effective overseas network of ports, logistics, finance and industry zones. In the first half of 2017, the container throughput of CMPort in mainland China reached 3,788 million TEU, up to 9.9% of year-on-year growth. Meanwhile, its total container throughput in Hong Kong and Taiwan was 3.74 million TEU, increased by 20.9% comparing with the throughput at the same period last year. The throughput of overseas ports was 8.54 million TEU, which basically unchanged comparing with the same period last year. This was affected by the sale of an asset of the Terminal Link SAS in early 2017. Two overseas port projects, i.e., Colombo International Container Terminals Limited (CICT) in Sri Lanka and Lome Container Terminal S.A. (LCT) in Togo, increased by 21.2% and 42.2% respectively (see Table 4) (China Merchants Port, 2017). The overseas port business has become an increasingly important part of the company.

Table 4 Container throughput volume of CMPort in the first half of 2017

Terminals	*Regions/locations*	*Throughput* (*in ten thousand TEU*)	*Year-on-year growth rate*	*Percentage of total throughput*
Domestic terminals	Mainland China	3,788	9.9%	75.52%
	Hongkong	291	29.0%	5.80%
	Taiwan – Kaohsiung	83	–1.0%	1.65%
Overseas terminals	Nigeria – Lagos	20	–0.8%	0.40%
	Djibouti – Djibouti City	48	–3.7%	0.96%
	Terminal Link	598	–4.6%	11.92%
	Sri Lanka – Colombo	111	21.2%	2.21%
	Togo – Lomé	36	42.2%	0.72%
	Turkey – Kumport	41	12.6%	0.82%
	Total throughput of overseas terminals	854	0.5%	17.03%
Total throughput of domestic and overseas terminals		5,016	8.9%	100%

Source: Authors' compilation based on information on CMPort website

Table 5 shows CMPort's 13 overseas port investment projects. CMPort started the overseas investment plan in 2008, when it was CMHI. It entered a joint venture agreement, through its wholly-owned subsidiary CM Vietnam, with two Vietnamese companies, i.e., Ben Dinh Sao Mai Port Development Joint Stock Company (BSPD) and Sao Mai-Ben Dinh Petroleum Investment Joint Stock Company (PVSB). The joint venture company is named Vung Tau International Container Port Company Limited (VICP) which constructs and operates the Ben Dinh Sao Mai Deep Seaport in Vietnam. CMHI held, through its subsidiary, 49% shares of the joint venture company, while its partners held the remaining 51%. Subsequently, in 2010, it established a joint venture company with China-Africa Development Fund to acquire 47.5% stake of Tin Can Island Container Terminal (TICT) in Lagos, Nigeria. In addition, between 2011 and 2015, the company invested in the CICT; Lome Container Terminal in Togo; 23.5% stake of Djibouti Port Company in East Africa; 49% stake of Terminal Link owned by CMA CGM; 50% of shares of Newcastle Port in Australia to operate 98 years; Kyaukpyu port in Myanmar; and Kumport Terminal in Istanbul with Cosco Shipping Ports. Recently, it signed the franchise agreement of Hambantota port on 29th July 2017, which is the second major investment project after CICT in Sri Lanka (CPPPC, 2017). In addition, the company signed a binding agreement with the Terminal de Contêineres de Paranaguá (TCP), which allowed CMPort to acquire 90% of TCP's shares for approximately BRL2.9 billion (USD925 million).

A few characteristics of CMPort's international investment can be found from Table 5. Firstly, like Cosco Shipping Ports, CMPort also adopted a global strategy without limiting investment in one continent. Since 2008, CMPort has broadened its business focus from domestic to global market. As a global terminal operator with worldwide businesses, its investment covers the regions including South Asia, Southeast Asia, South America, Oceania, East and West Africa, and Eurasia. Secondly, CMPort applied different investment modes, such as joint venture, acquisition, concession and build-operate-transfer (BOT), among which acquisition has been mainly adopted (eight of 13 projects). Two concession projects, i.e., the projects of Hambantota port and Newcastle port, involved the acquisition of shares. In addition to the port operation of the existing ports (brownfield), there are two greenfield projects through BOT agreement (more details of the concepts of BOT are presented in Section 3), i.e., the projects of CICT and Kyaukpyu port. The projects included not only port operations but also port constructions. Thirdly, similar to Cosco Shipping Ports, a high percentage of investment projects (nine out of 13) have occurred since 2013 when the BRI was initiated. It implies that the BRI may be a driving factor for the company's overseas investment.

2.2 Local port groups

With the global economic downturn and slowing port throughput growth, Chinese local port groups have considered internationalisation as one of their business strategies to increase profits and market shares. Table 6 shows ten overseas port investment projects undertaken by the local port groups, i.e., Guangxi Beibu Gulf Port Group, Shenzhen Yantian Port Group, Rizhao Port Group, Yantai Port Group, Hebei Port Group, Qingdao Port Group, Dalian Port Group and SIPG. Comparing with Cosco Shipping Ports and CMPort, local port groups' commencement in international port investment is late, with most of the investment starting after 2013 except that SIPG acquired 25% stake of APMTZ in Belgium in 2010. From 2013, the local port groups have accelerated the process of overseas port investment, with nine investment cases undertaken. It implies that the BRI might be one of the main stimulus for them to implement their international strategies.

The regions for investment cover Europe, East and West Africa, Middle East and Southeast Asia. Of notice is that Southeast Asia is the main region for investment, particularly Malaysia. It may be related to the promotion of Maritime Silk Road in the BRI. The local port groups invested in international port operation through joint venture, acquisition and concession, among which joint venture is mostly adopted (five out of ten projects). There are two mid-to-long-term concession projects undertaken in the Bayport terminal (port of Haifa, Israel) from 2021 by SIPG for 25 years and in Kuantan Port Malaysia since 2015 by Guangxi Beibu Gulf Port Group for 30 years. For the latter project, another 30 years could be added on subject to the fulfilment of certain obligation required by the Malaysian Government.

Table 5 International port investment of China Merchants Port

Foreign port	*Year*	*International port investment project*	*Region/country*	*Share*	*Modality*
TCP	2017	Signed a binding agreement whereby CMPort will acquire 90% of TCP's shares for approximately BRL2.9 billion (USD925 million). TCP manages the Terminal de Contêineres de Paranaguá, one of the largest container terminals in South America, and the logistics company TCP Log.	South America Brazil	90%	Acquisition
Hambantota Port	2017	Got 85% stake of Hambantota port in Sri Lanka, and a 99-year lease paying USD1.12 billion.	South Asia Sri Lanka	85%	Acquisition Concession (PPP)
Kumport Terminal	2015	Formed a consortium with Cosco Shipping Ports and CIC Capital Corporation (CIC Capital) to acquire 65% stake of Kumport terminal in Istanbul, Turkey paying USD940 million in September 2015. Three companies had equity stakes of 40%, 40% and 20% respectively in the consortium.	Eurasia Turkey	26%	Acquisition
Kyaukpyu Port	2015	The CITIC consortium, including China Harbour Engineering Company (CHEC), China Merchants Holdings, TEDA Investment Holding,Yunnan Construction Engineering Group and Thailand's Charoen Pokphand Group (the only non-Chinese state-owned company), was awarded a tender of the BOT project of deep-sea port and industry park of Kyaukpyu special economic zone in Myanmar with the 50 years operation period.	Southeast Asia Myanmar	—	BOT (PPP)
Zarubino Port	2014	The Summa Group has reached an agreement with CMHI on the joint construction of Big Port Zarubino in Primorsky Krai.	Eurasia Russia	—	—
Newcastle Port	2014	Acquired Newcastle port in Australia jointly with the Infrastructure Fund, each own 50%. Got the 98 years lease of Newcastle port with the NSW Government which commenced on 30th May 2014.	Oceania Australia	50%	Acquisition Concession (PPP)
Bagamoyo Port	2013	The framework agreement on the construction of Bagamoyo Port and Special Economic Zone project was signed between CMHI, Oman's State General Reserve Fund and Tanzania government in March 2013. The negotiations were completed to pave the way for implementation of the project in October 2017.	East Africa Tanzania	—	—
PDSA	2013	Acquired 23.5% of Port of Djibouti S.A. (PDSA) in February 2013. The core assets of PDSA included the Port of Djibouti (POD), Doraleh Container Terminal (DCT), off dock depot (DDP) and Doraleh Multi-Purpose Port (DMP).	East Africa Djibouti	23.5%	Acquisition (PPP)

Note: '—' denotes unknown data.

Source: Authors' compilation based on a wide range of sources

Table 5 International port investment of China Merchants Port (continued)

Foreign port	*Year*	*International port investment project*	*Region/country*	*Share*	*Modality*
Terminal Link	2013	Acquired 49% stake of Terminal Link owned by CMA CGM paying EUR0.4 billion. Terminal Link is active in 14 ports of eight countries (including China), such as the US (Houston and Miami), France (Montoir, Le Havre, Dunkirk, Fos), Belgium (Zeebrugge, Antwerp), Morocco (Tangier, Casablanca), Malta (Marsaxlokk), Ivory Coast (Abidjan), South Korea (Busan) and China (Xiamen).	Around the world	49%	Acquisition
Lome Container Terminal	2012	Acquired 50% stake of Thesar Maritime Limited (TML) to take over the development and operation of the Lome Container Terminal (LCT) in Togo for 35 years, which was owned by TML before.	West Africa Togo	50%	Acquisition
CICT	2011	The Colombo International Container Terminal co., LTD. (CICT), as a joint venture between CMPort and the port authority of Sri Lanka with a share of 85% and 15% respectively, won the BOT agreement, was responsible for the construction and 35 years operation of the Colombo container terminal, would return the terminal to the government of Sri Lanka after the expiration of its operation.	South Asia Sri Lanka	85%	BOT (PPP)
TICT	2010	Established the joint venture company with China-Africa Development Fund to acquire 47.5% stake of Tin Can Island Container Terminal (TICT) in Lagos, Nigeria paying USD154 million. CMPort held 28.5% stake. TICT was setup in June 2006 by the government of Nigeria.	West Africa Nigeria	28.5%	Acquisition (PPP)
VICP	2008	Entered the Joint Venture Agreement for the establishment of a joint venture company in Hanoi, Vietnam. The Project is the Group's first overseas port project. The joint venture company named Vung Tau International Container Port Joint Stock Company (VICP) was formed in 2010. CM Vietnam, BSPD and PVSB held 49%, 26% and 25% interest in VICP, respectively.	Southeast Asia Vietnam	49%	Joint venture

Note: '—' denotes unknown data.

Source: Authors' compilation based on a wide range of sources

Table 6 International investment of Chinese local port groups

Chinese company	*Year*	*International port investment project*	*Foreign port*	*Region/country*	*Modality*
Dalian Port Group	2016	Signed the *Djibouti Free Trade Zone Investment Agreement*. The project was operated by a joint venture invested by Chinese enterprises including CMPort, Dalian port as well as the Djibouti government. Planned to invest DMP and jointly conduct port operation.	DMP and Djibouti Free Trade Zone	East Africa Djibouti	Joint venture (PPP)
Guangxi Beibu Gulf Port Group	2017	On 21st February 2017, the joint venture company – Muara Port Co. Ltd (51% stake held by Guangxi Beibu Gulf Port Group) took over the operation of the container terminal of Muara port in Brunei.	Muara port	Southeast Asia Brunei	Joint venture
	2015	Acquired 40% stake of Kuantan Port Consortium Sdn. Bhd. (KPC) and got the concession of Kuantan Port for a period of 30 years plus another 30 years subject to fulfilment of certain obligation by KPC to the Government since 2015.	Kuantan port	Southeast Asia Malaysia	Acquisition Concession (PPP)
	2013	Malaysia-China Kuantan Industrial Park (MCKIP) was jointly developed by both Malaysia and China with 49% stake held by Guangxi Beibu Gulf Port Group.	MCKIP	Southeast Asia Malaysia	Joint venture (PPP)
Shenzhen Yantian Port Group and Rizhao Port Group	2016	Signed the Memorandum of Agreement (MOA) for the construction and development of Melaka Gateway port with KAJ Development Sdn Bhd (KAJD) and POWERCHINA International.	Melaka Gateway port	Southeast Asia Malaysia	Joint venture (PPP)
Hebei Port Group	2016	Setup a subsidiary, Qinhai Port Company in Jakarta, Indonesia, to run a local port project in Jambi industrial park in Indonesia, which is the first overseas port project for Hebei port group.	Jambi industrial park port	Southeast Asia Indonesia	—
Qingdao Port Group	2016	Purchased 9.9% shares of Vado Holding B.V from APM Terminals with EUR17.454 million. It is the first try to invest into foreign terminal business for Qingdao Port.	Vado port	South Europe Italy	Acquisition
Yantai Port Group	2013	China Hongqiao Group, Singapore Winning International Group, Yantai Port Group, Guinea United Mining Supply (UMS) formed a consortium (Winning Alliance Group) to further develop Guinea's bauxite trade. The port project aims to build two bauxite berths, one heavy cargo berth, as well as loading belts.	Guinea Boke port	West Africa Guinea	Joint venture
Shanghai International Port Group (SIPG)	2015	SIPG won the bid for concession of Bayport terminal (port of Haifa, Israel) operations for 25 years from 2021.	Haifa port	Middle East Israel	Concession (PPP)
	2010	Acquired 25% stake of APM Terminals Zeebrugge NV (APMTZ) in Belgium and became the company's second largest shareholder.	Zeebrugge terminal	Europe Belgium	Acquisition

Note: '—' denotes unknown data.

Source: Authors' compilation based on a wide range of sources

3 International port investment modalities of Chinese port-related companies

The discussion in Section 2 indicates that Chinese port-related companies adopted four major modalities for international port investment, i.e., acquisition, joint venture, concession and BOT. It is noted that some of the projects can be categorised as public and private partnership (PPP) projects. This section further explains the implementation of these four modalities based on the analysis of collated cases shown in Tables 2, 5, and 6 in Section 2. Table 7 shows the difference of these four international port investment modalities, explained in the following sub-sections.

Table 7 Four major modalities of international port investments

Modality types	*Main features*	*Risk transfers*	*Numbers (out of 39)*	*Main players*
Acquisition	• A company acquires shares from either private entities or state-owned enterprises (SOEs) in host countries. • Partly or wholly of SOEs can be regarded as a PPP, usually called a partial divestiture or total divestiture.	The company is responsible for all aspects hence risks in infrastructure provision.	21	Cosco Shipping Ports (10/16), CMPort (8/13), local port groups (3/10)
Joint venture	• A jointly owned and independent company is setup by two or more organisations, who share the resources, costs, expertise and profits.	All risks are shared between the joint venture partners.	8	Cosco Shipping Ports (2/16), CMPort (1/13), local port groups (5/10)
Concession	• Lease or franchise or affermage brownfield. • A government transfers operating rights to private enterprise, but still retains the ultimate ownership of assets.	No equity risk is borne by the private company, with additional risk of keeping the facility up to certain technical standards.	7	Cosco Shipping Ports (3/16), CMPort (2/13), local port groups (2/10)
BOT	• Private company builds the facility and operates the facility on a concession. • At the end of the concession, the facility is transferred to the government.	Private company assumes equity, construction risk and other commercial risks.	2	CMPort (2/13)

Note: In the last column 'main players', the content in the brackets means the number of projects by using the respective investment modalities to the total number of foreign port investments of that organisation.

Source: Authors' compilation based on PPIAF (2009a, 2009b) and Sections 2 and 3

3.1 Acquisition

An acquisition is a corporate action in which a company buys an equity stake of another firm's ownership stakes. It is the most common approach Chinese port-related companies have used for expanding their business overseas. As shown in Table 7, a total of 21 investment projects were conducted through acquisition of shares (ten from Cosco Shipping Ports, eight from CMPort and three from local port groups). Chinese port-related companies acquired shares from either private business entities (e.g., APM Terminals) or state-owned enterprises (SOEs) (e.g., Newcastle port Australia) in the host countries. The cases of acquisition for SOEs can be regarded as a PPP, usually called a divestiture. It refers to a private entity's purchase of an equity stake of a SOE though a sale of assets or a public offer (PPI Database, 2017). Partial divestiture means a government transfers part of the equity of a SOE to private entities but still maintains some certain ownership, while full divestiture means 100% of the equity of the SOE is sold to private entities (PPIAF, 2009b). Partial divestiture is a normal practice adopted by many countries for private sectors' investment in ports because full privatisation in ports is politically controversial due to national interests (PPIAF, 2007).

Investment projects through such PPP form were mainly undertaken by terminal operators, with one case from Cosco Shipping Ports and four cases from CMPort (see Tables 2 and 5).

- Cosco Shipping Ports: acquired 51% stake of Piraeus port in 2016 and will acquire additional 16% within five years. It has become the largest shareholder of the state-owned Piraeus Port Authority (PPA).
- CMPort:
  1. Formed a joint venture company with China-Africa Development Fund to acquire 47.5% stake of Tin Can Island Container Terminal (TICT), which is a SOE in Lagos Nigeria.
  2. Acquired 23.3% of stakes of state-owned Port De Djibouti S.A.
  3. Acquired 50% of stake of Newcastle port in Australia.
  4. Acquired 85% of Hambantota port in Sri Lanka.

3.2 Joint venture

According to Cass (1988), a joint venture, as a company's organisational structure, usually involves in setting up a jointly owned, independent company by two or more organisations, who share the resources, costs, expertise and profits. Joint venture arrangements can be either public-private or private-private entities. For example, private sectors' involvement in Chinese ports operation generally takes the form of joint venture between private terminal operators and the public port companies. Generally, foreign investors have minority shares in Chinese port terminals.

There are eight international port investment projects undertaken through the joint venture approach by Chinese port-related companies (Table 7). Among them two were adopted by Cosco Shipping Ports, one by CMPort and five by local port groups. If the joint venture partners of Chinese port-related companies are public entities in the host countries, the investment cases can be categorised as a PPP. Among the eight joint venture cases, three projects undertaken by local port groups were in a PPP modality (Table 6). These include:

- Dalian Port Group in Djibouti DMP and Free Trade Zone
- Guangxi Beibu Gulf Port Group in MCKIP Malaysia
- Shenzhen Yantian Port Group and Rizhao Port Group in Melaka Gateway port Malaysia.

3.3 Concession

A concession is the grant of specific privileges by the public sector. The concession is also referred as franchise or lease (also known as 'affermage') (PPIAF, 2009a). It is a contract and legal technique by which the grantee gets the right to finance, build and operate a facility for a long period of time. Concessions, a PPP modality, are widely used in the port sector. A port concession is a contract in which a government transfers operating rights to private enterprise. Governments retain the ultimate ownership of assets (especially land), are responsibility for licensing port operations and construction activities and safeguard public interests; however, they transfer a major part of the financial and operational risks to the private sector (PPIAF, 2007).

There are two main forms of concession used in ports: operation and maintenance concessions (lease or franchise contracts) and BOT concessions. BOT concessions, as in Section 3.4, are normally used in greenfield projects, where the operator covers investment costs and bear all commercial risks (PPIAF, 2007, 2009a; Cass, 1998). Operation and maintenance concessions are used in brownfield projects, where an operator enters a long-term lease on the port land and usually is responsible for superstructure and equipment. These concessions enable the public sector to transfer the commercial risk to the private sector and to create incentives for the private sector to ensure efficient revenue collection and to undertake regular maintenance to increase the reliability of facilities and postpone their renewal (PPIAF, 2007, 2009a; Cass, 1998).

A total of seven cases of port investment were through a concession approach (Table 7). Among them, three were undertaken by Cosco Shipping Ports, two by CMPort, and two by local port groups, i.e., Guangxi Beibu Gulf Port Group and SIPG (Table 6). These include:

- Cosco Shipping Ports acquired the 35 years franchise of number 2 and 3 container terminals of Piraeus port; leased number 25, 28 and 30 terminals from Seattle Port Authority; and signed a 35-year concession agreement with Abu Dhabi Ports for operating Khalifa Port Container Terminal 2.
- CMPort, jointly with the Infrastructure Fund, got a 98-year concession of managing Newcastle port in Australia. In addition, it signed the franchise agreement with Hambantota port in Sri Lanka to receive a 99-year concession by paying USD1.12 billion.
- Guangxi Beibu Gulf Port Group got the concession of Kuantan Port for a period of 30 years plus another 30 years subject to fulfilment of certain obligation by KPC to the Government.

- SIPG won a concession bid for terminal operation in Haifa new harbour Israel for 25 years, which will take effect from 2021.

3.4 BOT

BOT refers to a private sector builds a new facility and operates the facility, then transfers the facility to the public sector at the end of the concession period (Partnerships Kosovo, 2009). The BOT modality is very common for new greenfield projects. A government or public sector grants a concession to a private consortium for a pre-determined period to finance, build, operate, maintain and manage the project. Sometimes the private consortium is called concessionaire or special purpose company (SPC). It recoups its investment costs and makes a profit through user payments. At the end of the concession period, it transfers the project to the government in a condition defined in the concession contract (PPIAF, 2009b). This method has been used commonly in the port industry, particularly as a means of port privatisation.

A BOT project structure is very complex, involving many stakeholders who are contractually bound. The concessionaire or SPC procures the PPP project from the government or local government or other public entity though a BOT concession agreement. It also takes the responsibility of developing (designing, financing and constructing), maintaining and operating the infrastructure. It contributes equity finance to the project as the owner during the concession period. Debt financing is obtained from capital markets though shareholders agreement and loan agreement, supplied by the private sector and investors including both shareholders and lenders.

Among the 39 collected investment cases, BOT approach is the least used approach by Chinese port-related companies. There were only two cases undertaken by CMPort (see Table 7) as follows:

- The BOT project of the CICT Sri Lanka. It is responsible for the construction and 35-year operation and will return the terminal to the government of Sri Lanka after the expiration of its operation (China Merchants Port, 2017).
- The BOT project of deep sea port and industry park of Kyaukpyu special economic zone in Myanmar with the 50 years operation period.

4 Key findings

According to the analysis in Sections 2 and 3, this section discusses four key findings.

4.1 BRI as a driving factor of international port investment

This study finds that 28 out of 39 projects occurred in or after 2013, when the national strategy BRI was initiated. Cosco Shipping Ports, CMPort and local port groups, as Chinese SOEs, have the mission to implement the national strategy through foreign port and terminal investment. This is evident by several investments are along with the maritime silk road (see Figure 1), such as ports in Vietnam, Malaysia, Sri Lanka, Djibouti, Egypt, Malta, Greece, France and the Netherlands. In addition, Chinese private companies have been involved in international port investment projects, such as

Shandong Landbridge Group, mainly specialising in the infrastructure and energy industry. In 2004, Landbridge Group funded Landbridge Port, and started the port logistics business. In 2015, the company won the bid for the 99-year lease of Port of Darwin, Australia. Subsequently, in 2016 it acquired the Margarita Island Port in Colón Free Trade Zone, Panama. International port investment can not only improve the international shipping network to secure the import supply of energy resources, but also promote the development of foreign trade. In addition, it can also drive port engineering and port equipment manufacturing companies to go abroad together, such as China Harbour Engineering Company (CHEC) and Shanghai Zhenhua Heavy Industries (ZPMC).

Despite BRI is a driving factor, the downturn of the international shipping and maritime industry (including China) and port privatisation initiates in other countries have provided investment opportunities for Chinese port-related companies. After the financial crisis, the shipping industry has been experiencing slow growth with the global economic slowdown. Internationally, some ports and terminal have financial challenge and require investment from outsiders. In emerging countries, they demand inputs of capital, technology and expertise of port development and management. In addition, the growth of domestic port throughput has slowed down. With overcapacity and limited market growth, Chinese port-related companies have been looking for new market opportunities and consider foreign port business investment as a new market for making profits, particularly those countries and regions along the Belt and Road. Therefore, BRI, coupled with these factors may accelerate the speed for Chinese port-related companies to undertake international port and terminal investment.

4.2 Adopting PPP models

The discussion in Section 3 shows that 15 out of 39 international port investments were related to PPP, i.e., collaboration between Chinese companies as private entities and public sectors in host countries. Among the 15 projects, six were undertaken by CMPort, five by local port groups and four from Cosco Shipping Ports. Among Cosco Shipping Ports, CMPort and local port groups, local port groups' investment projects are of the highest percentage of PPPs (50%), followed by CMPort (46%) and Cosco Shipping Ports (25%). These PPP models include concession, BOT, public-private joint venture, and acquisition for partial port assets owned by SOE in host countries (i.e., partial divestiture). These models are among those common PPP models used in the port sector (Farrel, 2010). As discussed in Sections 3.1–3.4, a total of five partial divestiture projects were undertaken by CMPort and Cosco Shipping Ports only, while three joint venture in PPP mode were only undertaken by three local port groups. CMPort is the only company implementing overseas investment through BOT. As for concession, Cosco Shipping Ports, CMPort and two local port groups local ports are involved in projects through this modality.

It is not unusual that the port investment model is decided by the hosting country, depending on their culture, business environment, regulation, etc. However, this research suggests Chinese port-related companies, as investors, to compare the different PPP forms through the analysis of the key characteristics and details of different PPP models in the port sector, such as financial modes and risk allocation, to choose appropriate PPP models by integrating their own expertise and investment objectives. For example,

Table 7 shows acquisition is the most popular mode adopted by Chinese port enterprises especially by port and terminal operators, while BOT approach is the least used. This may be the reason that greenfield projects, to which BOT approach is normally applied, have relatively high risks compared to other PPP models. Particularly, port/terminal operators are facing a dynamic market with increased risks and challenges in terms of returns. Nevertheless, a company's investment objectives may also influence the selection of investment models. If expanding the market share is the company's main short-term objective, investing existing ports/terminals through merger and acquisition or lease/concession would enable the company to achieve the goal quickly compared to BOT.

4.3 Partnership for investment

It is noted that forming consortia with other companies for international port investment is a common approach adopted by Chinese port-related companies, particularly for local port groups. Port groups can contribute to the project with their technical expertise and experience in port construction, operations and management, as well as their extensive network of shipping lines and alliances around the globe. Partnership benefits each company and allows them to share risks. The following projects are the examples.

- The deep-sea port and industry park of Kyaukpyu special economic zone in Myanmar. CITIC consortium consists of CHEC, CMHI, TEDA Investment Holding, Yunnan Construction Engineering Group and Thailand's Charoen Pokphand Group (the only non-Chinese state-owned company).
- Kumport terminal in Istanbul, Turkey. Cosco Shipping Ports, CMPort and CIC Capital Corporation (CIC Capital) formed a consortium to acquire 65% stake of the terminal.
- Guinea's bauxite trade. Yantai Port Group with other domestic and international companies, i.e., China Hongqiao Group, Singapore Winning International Group, and Guinea United Mining Supply (UMS) formed a consortium (Winning Alliance Group) to build two bauxite berths as well as loading belts (China Mining, 2017).
- Free trade zone project in Djibouti Africa. Dalian Port Group, CMPort and the Djibouti Government formed a joint venture company to invest in.
- Melaka Gateway Port project. Yantian Port Group and Rizhao Port Group collaborated with POWERCHINA International and Malaysian company KAJ Development Sdn Bhd (KAJD).

4.4 Involvement in integrated development of Port-Park-City

The concept of Port-Park-City (PPC) has been applied in international port projects to develop industrial parks in port vicinity areas. PPC, also called 'Shekou' mode, is derived from CMPort's 30 years' experience of developing 'Shekou' industrial park. The investment is not only in ports but industrial parks and cities, which allows the joint interaction between ports and urban areas. An example of the application of 'Shekou' mode in foreign ports was the Djibouti Free Trade Zone Investment undertaken by CMPort, Dalian port as well as the Djibouti government (China Merchants Port, 2017). In addition, CMPort was involved in the BOT project of deep sea port and industry park of Kyaukpyu special economic zone in Myanmar and Bagamoyo Port and Special Economic Zone project in Tanzania. The PPC concept is also applied in two projects in Malaysia which local port groups are involved in, i.e., Malaysia-China Kuantan Industrial Park (MCKIP) and Melaka Gateway port project. The projects promote regional economic growth through the integrated development of the ports, parks and cities, aimed at bringing more shipping demands.

5 Conclusions

This paper is developed mainly based on and furthering Professor Goss' works (1990b, 1990c, 1995). In Professor Goss' works, he addressed a port's economic functions, and the public port authority's role and strategies in managing ports. He questioned and discussed whether public port authorities are necessary concerning 'market failure' and 'government failure'. He provided several management strategies for public port authorities' consideration, including port authorities undertaking minimal activities and leaving major port operations to the private sector, i.e., the landlord approach. This approach has been popular and adopted by many ports globally in their privatisation process. Moreover, many public landlord port authorities have been restructured as public port companies or groups and gradually separated their regulatory and business functions with an entrepreneur role in managing ports. This development trend has laid the fertile ground for ports to conduct various investments outside of ports domestically and internationally. Therefore, Professor Goss has provided the authors with a solid theoretical background to develop this paper to explore how public port authorities and related port enterprises expand their business internationally in collaboration with other international ports.

The devolution of Chinese port governance since 1990s has resulted in not only the private sectors' involvement in Chinese port investment and development but also allowing local port groups and terminal operators to implement international strategies. The BRI further promoted overseas port investment and operation through acquisition, joint venture, concession, and BOT. This paper found that the two terminal operators, Cosco Shipping Ports and CMPort mainly adopted acquisition for their international port investments, while local port groups mainly adopted a joint venture approach. Among those investment projects, some of them are PPP projects, including five partial divestiture projects by Cosco Shipping Ports and CMPort, three public-private joint venture projects by local port groups, two BOT projects by CMPort, and seven concession projects by Cosco Shipping Ports, CMPort and local groups. It also found that the companies mainly formed a partnership for investment. Some of the investment projects involved an integration of development of ports, industrial parks and cities.

This paper provides the reference and draws implications for similar overseas port investment of other companies through the analysis of international port investment projects and discussion of four key findings. The overseas expansion of the Chinese port industry is expected to bring positive benefit to China and the Chinese related port businesses. However, there are risks and challenges faced them, such as political, economic, legal and ecological risks. For example, there has been considerable interference and resistance associated with both Hambantota port and Piraeus Port projects, conducted by CMPort and Cosco Shipping Ports respectively. Sri Lankans held a protest for the Hambantota port project as they are afraid of losing lands and threatening their national security. The Greek government ever called off the Piraeus Port acquisition program by Cosco in 2015. Therefore, in the process of overseas expansion, Chinese port-related companies need to analyse the risks of different investment models, prepare a risk management plan, and establish a good monitoring mechanism in collaborating with all partners.

It is necessary to analyse the potential risk and compare the cost and benefit of the investment activities, however some of the international investments are driven by governments. Due to the difficulties of economic appraisal of international port investments, many of the investments have been made because of representations from interested parties, and stem from vague and unquantified considerations of 'public need' rather than from any explicit calculations of economic advantages (Goss, 1967). Based on the target of profit maximisation, it is necessary for Chinese port-related companies to conduct the comprehensive economic appraisal.

This paper contributes to academic research by analysing international investment strategies of port companies and terminal operators. In practice, it draws implications on the risk management and economic appraisal associated with international port investments. However, very little research focusing on how to conduct the risk management and economic appraisal of international port investment. This provides a meaningful direction for future research. In addition, data in this paper were collected mainly from secondary information. It might be a limitation in achieving details inside of investigated cases. Further studies can focus on evaluating the results of international investments through in-depth case studies.

References

APM Terminals (2014) Media Kit [online] http://webcache.googleusercontent.com/search?q=cache:7Nv9DA7T99sJ:www.apmterminals.com/en/~/media/719570728F20489CB8D41B459F911ED4.ashx+&cd=1&hl=en&ct=clnk&gl=au (accessed 26 July 2018).

APM Terminals (2018) *About Us* [online] http://www.apmterminals.com/en/about-us (accessed 2 June 2018).

Cass, S. (1998) *World Port Privatisation*, IIR Publications Ltd, London.

Chen, S.L. (2009) 'Port administrative structure change worldwide: its implication for restructuring port authorities in Taiwan', *Transport Reviews*, Vol. 29, No. 2, pp.163–181.

China Merchants Port (2017) [online] http://www.cmport.com.hk/Default.aspx (accessed 20 November 2017).

China Mining (2017) *Yantai Port Co-Invests in GUINEA BAUXITE PORT* [online] http://en.chinamining.com.cn/Investment/2015-04-16/1429152499d71868.html (accessed 27 November 2017).

China Public Private Partnerships Center (CPPPC) (2017) *'The Belt and Road' PPP Project Case – Colombo Port City Project of Sri Lanka*, in Chinese [online] http://www.cpppc.org/zh/ydylal/5482.jhtml (accessed 20 November 2017).

Cosco Shipping Ports (2017) [online] http://www.coscopac.com.hk/cn/ (accessed 20 November 2017).

Dooms, M., Van der Lugt, L. and de Langen, P.W. (2013) 'International strategies of port authorities: the case of the Port of Rotterdam Authority', *Research in Transportation Business & Management*, Vol. 8, pp.148–157.

DP World (2014) *Annual Report and Accounts 2013* [online] http://web.dpworld.com/wp-content/uploads/2014/05/2013DPWorldAnnualReportAccounts.pdf (accessed 26 July 2018).

DP World (2018) *Annual Report and Accounts 2017* [online] http://ar.dpworld.com/2017/ (accessed 26 July 2018).

Farrel, S. (2010) *Observations on PPP Models in the Ports Sector* [online] http://ppp-ukraine.org/wp-content/uploads/2015/10/PPPs-in-the-Port-Sector.pdf (accessed 20 December 2017).

Goss, R.O. (1967) 'Towards an economic appraisal of port investments', *Journal of Transport Economics and Policy*, Vol. 1, No. 3, pp.249–272.

Goss, R.O. (1990a) 'Economic policies and seaports: the economic functions of seaports', *Maritime Policy & Management*, Vol. 17, No. 3, pp.207–219.

Goss, R.O. (1990b) 'Economic policies and seaports: are port authorities necessary?', *Maritime Policy & Management*, Vol. 17, No. 4, pp.257–271.

Goss, R.O. (1990c) 'Economic policies and seaports: strategies for port authorities', *Maritime Policy & Management*, Vol. 17, No. 4, pp.273–287.

Goss, R.O. (1995) 'The new role of port authorities', *Proceedings of UK Port Privatization Conference*, Scottish Transport Studies Group, Edinburgh, 21 September.

Huo, W., Zhang, W. and Chen, P.S-L. (2018) 'Recent development of Chinese port cooperation strategies', *Research in Transportation Business & Management*, Vol. 26, pp.67–75.

Hutchison Ports (2018) *Company Profile* [online] https://hutchisonports.com/en/about-us/company-profile/ (accessed 30 June 2018).

Lee, P.T-W. and Flynn, M. (2011) 'Charting a new paradigm of container port development policy: the Asian doctrine', *Transport Reviews*, Vol. 31, No. 6, pp.791–806.

Lee, P.T-W. and Lam, J.S.L. (2017) 'A review of port devolution and governance models with compound eyes approach', *Transport Reviews*, Vol. 37, No. 4, pp.507–520.

Liu, J. (2017) *The Strategy of Foreign Development of Chinese Port Companies*, Shipping Bulletin, in Chinese [online] http://info.chineseshipping.com.cn/cninfo/TodayTopNews/201706/t20170628_1291296.shtml (accessed 20 November 2017).

Liu, N., Gong, Z. and Xiao, X. (2018) 'Disaster prevention and strategic investment for multiple ports in a region: cooperation or not', *Maritime Policy & Management*, Vol. 45, No. 5, pp.585–603.

Notteboom, T. and Yang, Z. (2017) 'Port governance in China since 2004: institutional layering and the growing impact of broader policies', *Research in Transportation Business & Management*, Vol. 22, pp.184–200.

Partnerships Kosovo (2009) *Public-Private Partnerships: Bridging Kosovo's Infrastructure Gap* [online] http://www.pppkosova.org/repository/docs/public_private_partnerships.pdf (accessed 20 November 2017).

PPI Database (2017) *Glossary of Terms*, World Bank [online] https://ppi.worldbank.org/methodology/glossary (accessed 20 November 2017).

PSA International (2014) *Annual Report 2014* [online] https://www.globalpsa.com/assets/uploads/AR2014-Around-The-World-With-A-Trusted-Partner.pdf (accessed 30 June 2018).

PSA International (2017) *Annual Report 2017* [online] https://www.globalpsa.com/ar/ (accessed 30 June 2018).

Public-Private Infrastructure Advisory Facility (PPIAF) (2007) 'Module 3: alternative port management structures and ownership models', *Port Reform Toolkit: Effective Support for Policymakers and Practitioners*, 2nd ed., World Bank [online] https://ppiaf.org/sites/ppiaf.org/files/documents/toolkits/Portoolkit/Toolkit/pdf/modules/03_TOOLKIT_Module3.pdf (accessed 10 November 2017).

Public-Private Infrastructure Advisory Facility (PPIAF) (2009a) 'Main types of PPP', *Toolkit for Public-Private Partnerships in Roads & Highways*, World Bank [online] https://ppiaf.org/sites/ppiaf.org/files/documents/toolkits/highwaystoolkit/6/pdf-version/1-13.pdf (accessed 20 November 2017).

Public-Private Infrastructure Advisory Facility (PPIAF) (2009b) 'PPP modalities', *Toolkit for Public-Private Partnerships in roads & Highways*, World Bank [online] https://ppiaf.org/sites/ppiaf.org/files/documents/toolkits/highwaystoolkit/6/pdf-version/5-36.pdf (accessed 20 November 2017).

Sislioglu, M., Celik, M. and Ozkaynak, S. (2018) 'A simulation model proposal to improve the productivity of container terminal operations through investment alternatives', *Maritime Policy & Management*, 5 July [online] https://doi.org/10.1080/03088839.2018.1481544 (accessed 15 September 2018).

Wu, S., Li, K.X., Shi, W. and Yang, Z. (2016) 'Influence of local government on port investment: implications of China's decentralized port governance system', *Maritime Policy & Management*, Vol. 43, No. 7, pp.777–797.

Xie, Z., Liu, W. and Zhang, H. (2017) 'The thinking of 'the Belt and Road' strategy and overseas port investment', *Pearl River Water Transport*, Vol. 15, pp.82–83.

Xu, M. and Chin, A.T.H. (2012) 'Port governance in China: devolution and effects analysis', *Social and Behavioral Sciences*, Vol. 43, pp.14–23.

Zhang, L. (2014) 'Analysis on overseas ports investment of Chinese ports and shipping companies', *Port Economy*, Vol. 3, pp.49–52.