

The concept of the cruise supply chain and its characteristics: an empirical study of China's cruise industry

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Abstract

Purpose – The cruise industry has witnessed steady growth, with passenger volume increasing from 17.8 million in 2009 to 30 million in 2019. In the context of global competition and an uncertain business environment, competition in business has changed dramatically from battles of “firm versus firm” to “supply chain versus supply chain”. Hence, the purpose of this paper is to understand the cruise industry from a chain perspective, which has not drawn widespread research attention.

Design/methodology/approach – This paper brings together the insights, opinions, concepts and frameworks from a literature review of different disciplines (maritime shipping, tourism management, logistics management, operations management and supply chain management) and analysis results from 22 semi-structured interviews to make an early attempt to conceptualise the cruise supply chain (CSC).

Findings – The cruise supply chain is elaborated on the process, the role of each entity and its characteristics by comparing with the maritime supply chain and tourism supply chain. Based on the understanding of the CSC, two specific characteristics of the Chinese CSC are examined, which need further investigation.

Originality/value – The CSC is articulated with detailed processes and characteristics based on the literature review and empirical study. The findings of this paper not only advance the knowledge of the supply chain in the cruise industry but also highlight the importance of further research on the CSC.

Keywords Cruise supply chain, Characteristics, Semi-structured interviews, China, Supply chain management

Paper type Research paper

1. Introduction

Since the late 1960s, the cruise industry has witnessed a constant growth (Pallis, 2015). Even during the 2008 global financial crisis and the unfortunate 2012 Costa Concordia accident, the number of cruise passengers increased (Cruise Lines International Association, 2020). The cruise industry contributes to the global economy by generating significant economic revenues and employment opportunities. For example, in 2019, cruising sustained over US\$154 billion in total output worldwide, with 29.7 million passengers taking cruises and creating 1.16 million jobs (Cruise Lines International Association, 2021).

It has been widely recognised that individual businesses no longer compete as solely autonomous entities but as supply chains (SCs) (Lambert *et al.*, 1998; Ketchen and Giunipero, 2004; Ketchen and Hult, 2007). Any disruption in an organisation may interrupt the whole SC operations (Scheibe and Blackhurst, 2018), which also suits the cruise industry. However, the SC view of cruise operation and management has not received much attention in the cruise industry. The unique characteristics of cruise shipping, including narrow time windows, repositioning cruises, global sourcing for multiple suppliers onboard and inland, high



standard of service quality and customer satisfaction, as well as greater exposure to global uncertainty, necessitate introducing the concept of the SC to the cruise industry. Hence, a better understanding of the concept of a cruise supply chain (CSC) is imperative for a systematic view of managing the cruise business in an uncertain environment. In particular, the cruise industry is currently disrupted by the COVID-19 pandemic severely. These motivate us to investigate the concept of the CSC and its characteristics.

By incorporating the literature and empirical results, this paper contributes to the conceptualisation of the CSC by elaborating its entities, detailed processes and activities, and characteristics. In addition, this paper advances the knowledge of the SC in the cruise industry by comparing the CSC with the maritime supply chain (MSC) and the tourism supply chain (TSC). This paper is beneficial to researchers and practitioners in the cruise industry to understand how the CSC works, the constituents and definition of the CSC and the differences between the CSC and the MSC and the TSC.

The SC concept has been applied to various service industries, e.g. the maritime industry (Lam, 2011) and the tourism industry (Zhang *et al.*, 2009). Disparate SC concepts are provided accordingly, the MSC aims to add value to the goods transported, while the TSC focuses on tourism products and services. Given that the cruise industry has the features of both tourism and maritime sectors, the CSC combines the supply of tourism products and services such as accommodations, itineraries, as well as transporting “cargos” (passengers), and interfacing with various entities (e.g. shipping companies and ports). Therefore, the CSC can be understood as a hybrid of the MSC and the TSC (Figure 1). The main research questions of this study are the following:

RQ1. How is the CSC articulated?

RQ2. What are the characteristics of the CSC compared with the MSC and the TSC?

2. Literature review of the CSC

Although great efforts have been made to examine the literature on cruise shipping, most of the studies focus on economic and policy issues (Vayá *et al.*, 2018; Wang *et al.*, 2020), managing cruise services (Chua *et al.*, 2015; Chiou *et al.*, 2021; Yuen *et al.*, 2021), illness and disease analysis (Li *et al.*, 2021), and itinerary planning (Chen and Nijkamp, 2018; Guo *et al.*, 2021). The literature review reveals that the extant studies were mainly undertaken from the perspective of cruise lines, with limited research from an SC perspective identified by Vaggelas and Lagoudis (2010), Diakomihalis and Stefanidaki (2011), Tsourakis (2012), and Qu *et al.* (2020).

As a pioneering work of the CSC, Veronneau and Roy (2009) defined the supply chain management (SCM) of a cruise ship as “the timely coordination of supply in anticipation of a demand in support to service delivery excellence” (Veronneau and Roy, 2009, p. 135). Also,

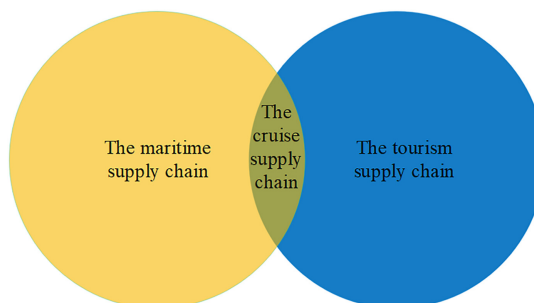


Figure 1.
A basic concept of
the CSC

they identified typical entities in the CSC, including port agents, suppliers' distribution centres, cruise corporations' distribution centres and cruise lines. Types of cruise ship suppliers were identified and classified by [Veronneau et al. \(2015\)](#), and major CSC entities were suggested by [Vaggeles and Lagoudis \(2010\)](#). [Tsourakis \(2012\)](#) elaborated on the cruise SCM with an emphasis on the upstream SC ending in the cruise companies and highlighted the responsibilities and roles of different entities, processes and operations in the CSC, including placing an order, procurement, storage, consolidation, transportation, loading and onboard activities. [Chu and Hsu \(2021\)](#) developed a CSC consisting of a cruise line, intermediaries and customers. Though the CSC was simple, covering only three entities and modified from the TSC, their study underlined the significance of travel agencies as an intermediary in the CSC. [Rodrigue and Wang \(2020\)](#) depicted the CSC from suppliers to a cruise ship with information flow and physical flow. [Qu et al. \(2020\)](#) built a conceptual framework of a simplified CSC, covering three entities only, suppliers, a cruise company and passengers. However, the concept of the CSC in both studies was not validated by an empirical study. Moreover, they focussed on the procurement process of cruise ships but lacked an investigation into other processes associated with providing services in the CSC.

A close inspection of these studies indicates that they focus mainly on a particular part of the CSC or some specific CSC processes, lacking a holistic view of the CSC. For example, [Veronneau and Roy \(2009\)](#) emphasised the operational replenishment only from suppliers to a cruise ship. [Tsourakis \(2012\)](#) focused on the upstream CSC, especially for the food and beverage outsourcing strategy. [Veronneau et al. \(2015\)](#) only examined the relationships between a major cruise line corporation and its suppliers in the CSC. [Rodrigue and Wang \(2020\)](#) concentrated on the procurement of supplies in the CSC. [Chu and Hsu \(2021\)](#) studied the relationship between cruise lines and travel agencies in the CSC. [Table 1](#) summarises the limitations and contributions of the existing literature. The research gap motivates the authors to articulate the CSC based on literature review and an empirical study, aiming at exploring a comprehensive CSC with entities, processes and activities, and interactions between entities. The results of this study help researchers and practitioners obtain a better understanding of the CSC.

3. Research methodology

After the literature review, semi-structured interviews were conducted to gain valuable perspectives from key stakeholders on the concept of the CSC. The scarcity of existing studies related to the concept of the CSC necessitates acquiring first-hand data and valuable viewpoints from stakeholders directly for an exploratory study. Furthermore, semi-structured telephone interviews enable the authors to collect in-depth information with the advantages of cost effectiveness and time efficiency ([Block and Erskine, 2012](#)). Therefore, this research chose qualitative semi-structured telephone interviews for data collection.

China has been the main driver of cruise passenger growth in Asia for the last few years ([Cruise Lines International Association, 2015](#); [Sun et al., 2019b](#)). Though the Chinese cruise market is developing rapidly, much of the cruising related research is centred on European countries and the Western hemisphere, with limited research focussing on an empirical study in China ([Sun et al., 2014](#); [Hung et al., 2019](#)). Therefore, this research chose China for an empirical study and provided a deep understanding of the Chinese CSC.

The semi-structured interview questions include three demographic questions and three questions related to the process, roles and functions of entities, and the characteristics of the CSC ([Table 2](#)).

A total of 22 telephone interviews with key stakeholders in the CSC (including cruise lines, cruise port operators, the pilot station, the maritime authority, travel agencies, cruise service companies, cruise port agents and the cruise industry association) were conducted. Most

Author	Aim	Contribution to this research	Limitation
Veronneau and Roy (2009)	To propose challenges to and solutions for global cruise supply chain management	<ol style="list-style-type: none"> (1) Defined the cruise supply chain management (2) Provided rich information for an in-depth understanding of the characteristics of the CSC (3) Explained major types of supplies in the CSC, including fuel, corporate, technical and hotel supplies (4) Configured typical entities in the CSC, including port agent, supplier's distribution centre, cruise corporation's distribution centre, cruise line 	<ol style="list-style-type: none"> (1) The CSC starts from a supplier and ends in a cruise ship as the ultimate customer without considering entities in cruise destinations (2) Focus on operational replenishment
Vaggelas and Lagoudis (2010)	To analyse and develop supply chain strategies for cruise lines to achieve a competitive advantage	<ol style="list-style-type: none"> (1) Identified travel agency as a significant CSC entity (2) Involved the service products in the CSC (e.g. cabins and excursions) 	<ol style="list-style-type: none"> (1) Examination of the CSC from the aspects of logistics type, flexibility and complexity (2) Focus on small cruise lines (3) Without articulating the CSC
Diakomihalis and Stefanidaki (2011)	To determine the factors that influence the decision of a cruise line to outsource in the CSC	Helped to investigate the characteristics of the CSC (e.g. the CSC is characterised by high complexity)	Focus on cruise lines' decisions to outsource
Tsourakis (2012)	<ol style="list-style-type: none"> (1) To analyse the SCM in the cruise industry (2) To examine the outsourcing strategy in the case of food and beverage 	<ol style="list-style-type: none"> (1) Elaborated on cruise supply chain management (2) Major entities in the upstream CSC were indicated, including supplier, logistics provider, world distribution centre, regional distribution centre, port agent and cruise ship (3) The responsibilities and roles of these members, the processes and operations in the CSC, from placing an order to loading onboard, were explained 	Focus on the upstream CSC, especially for food and beverage supplies and engine parts and hotel stores supplies

Table 1.
Limitations and contributions of previous CSC studies
(continued)

Author	Aim	Contribution to this research	Limitation
Veronneau et al. (2015)	To describe the nature of the relationships between a major cruise line corporation and its suppliers in the CSC	Provided a taxonomy classifying suppliers in the CSC as hotel suppliers, fuel suppliers, technical suppliers, food and beverage suppliers, transport service providers, and corporate suppliers	Focus on suppliers in the CSC
Rodrigue and Wang (2020)	To investigate the customised procurement practices of the CSC	(1) Depicted the procurement process in the CSC, from suppliers to a cruise ship with information flow and physical flow (2) Investigated the characteristics of the procurement of cruise ships	Concentration on procurement of supplies
Qu et al. (2020)	To investigate the effectiveness of incentive mechanisms between a cruise line and two kinds of suppliers (knowledge-incentive supplier and product supplier)	(1) Built a conceptual framework of the CSC (2) Explained the process of replenishment between a cruise company and its suppliers	Configurates a simplified CSC, covering three entities only (suppliers, a cruise company and passengers)
Chu and Hsu (2021)	To investigate the networks, relationships and power distribution between cruise lines and travel agencies	(1) Developed a CSC consisting of a cruise line, intermediaries and customers (2) Provided an in-depth understanding of the relationship and business between cruise lines and travel agencies	Configurates a CSC modified from a TSC with a focus on principal-agent relationship (between cruise lines and travel agencies)

Table 1.

Content	Research questions	Aims	Examples
Demographic information	–	To collect information on years of working, type of organisation and work position	What type of organisation are you working for?
Identification of components, flows and characteristics of the CSC	What is the concept of the CSC?	To collect information on the definition of the CSC from the processes, entities and services provided To collect information on the definition of the CSC from the roles and functions of entities	Can you explain your understanding of the processes, entities and services of the CSC? From your perspective, what are the roles and functions of each entity in the CSC?
Table 2. An explanation of interview questions	What are the characteristics of the CSC?	To collect information on the characteristics of the CSC	From your perspective, what are the characteristics of the CSC?

Table 2.
An explanation of interview questions

interviewees were senior managers who possessed more than five years' experience (Table 3). These present that these interviewees are likely to produce reliable results in the data collected. The interviews were noted and recorded with participants' prior consents and permissions, then transcribed and analysed by NVivo 12.

The data were analysed using a deductive qualitative content analysis (Elo and Kyngäs, 2008), which is suitable for an exploratory work with limited knowledge (the concept of the CSC) (Vaismoradi *et al.*, 2013). This approach enables the authors to guide the interviews by deriving and developing a structured matrix from the SC concept (Hewitt, 1994; Piboonrungrroj, 2012). Under this matrix, information associated with three categories (processes, roles and functions of entities, and characteristics of the CSC) can be obtained, such as how the SC entities run their business with other partners in the CSC. Furthermore, many participants may only be familiar with the services, processes and roles of entities connected to them. Thus, knowledge about the CSC was gained by combining the qualitative data from different participants, which enables the authors to propose the concept of the entire CSC. The detail of this procedure is shown in Appendix.

4. The concept of the CSC

4.1 Definition of the CSC and its components

As a hybrid concept, the CSC shares some differences and similarities with the MSC and the TSC (Figure 2). A typical MSC starts from shippers, through freight forwarders, shipping companies, ports and land transport operators, to consignees. A typical TSC starts from Tier 2 suppliers (e.g. food suppliers and drink suppliers) and Tier 1 suppliers (e.g. accommodation suppliers and transportation suppliers), through travel agencies/tour operators, to customers.

Referring to the existing literature on cruise studies with findings of the semi-structured interviews, this research develops the CSC shown in Figure 3 that presents major entities, processes and information, financial, physical and service flows.

The information and financial flows start from passengers booking cruises and shore excursions after obtaining information about cruise products. Passengers generate booking demand directly via the cruise lines' websites or indirectly with travel agencies or tour operators. Subsequently, cruise lines, travel agencies or tour operators gather and quickly respond to this booking information to request service information on transport, accommodation, catering, recreation etc. These SC entities, with other service providers, share and communicate information to integrate the whole procedure. Cruise lines consolidate service and product information to suppliers, vendors, cruise port operators and logistics providers to arrange schedules and facilities for cruises. Travel agencies or tour

Entities	Cruise line	9	Position	Junior manager	Cruise industry association	1
	Cruise service provider	3		Cruise port operator	1	
	Travel agency	2		Cruise line	1	
	Cruise port operator	2		Cruise service provider	1	
	Maritime authority	2		Port agent	1	
	Pilot station	1		Maritime authority	1	
	Cruise industry association	2		Senior manager	Cruise line	8
	Port agent	1		Travel agency	2	
	Working experience	0–5 years		8	Cruise service provider	2
		6–10 years		5	Cruise industry association	1
11–15 years		5	Cruise port operator	1		
16 years and above		4	Pilot station	1		
			Maritime authority	1		

Table 3.
Interviewees' profile

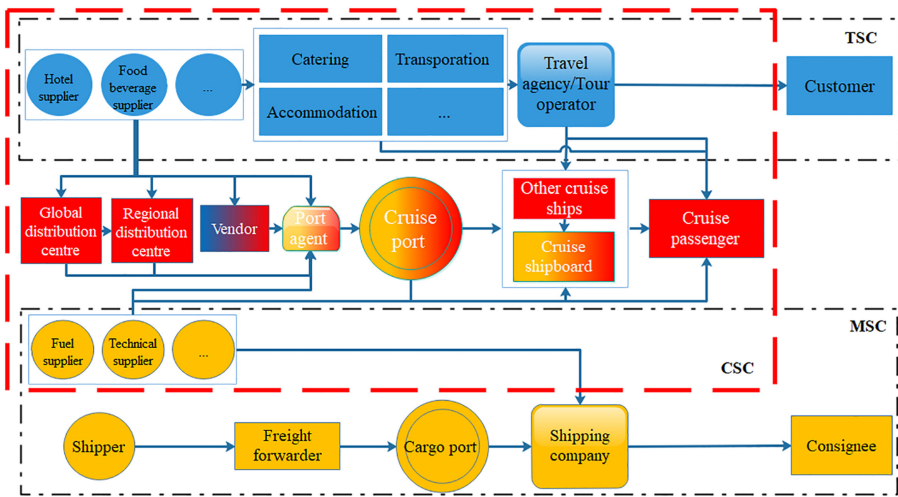


Figure 2.
A comparison of the
CSC, TSC and MSC

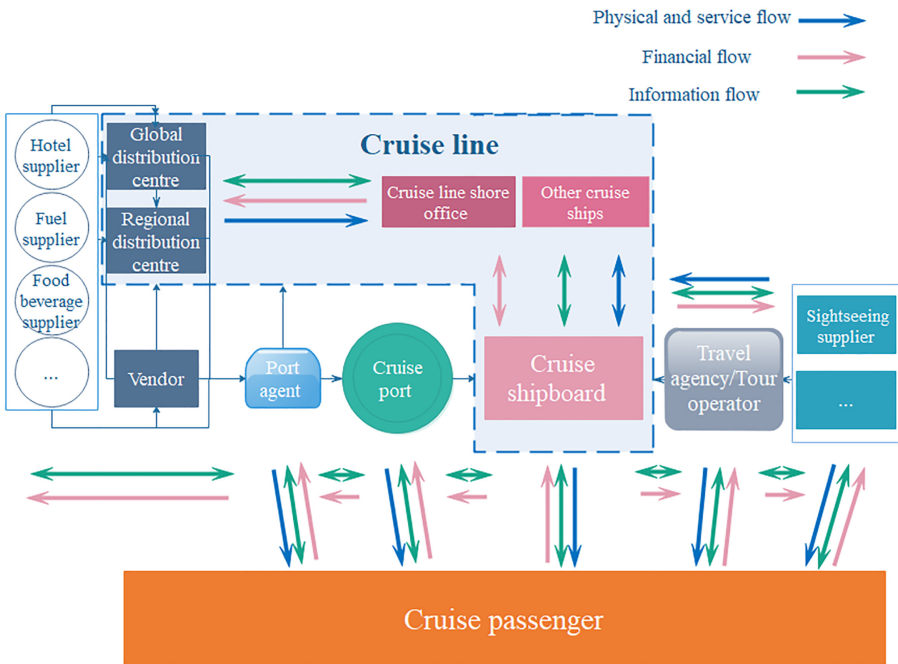


Figure 3.
A typical CSC

operators may also contact transport companies or tourist attractions for shore excursions. After cruising, passengers provide feedback on the cruise experience, which can be part of decision-making information (e.g. on the improvement of future shore excursion activities) for some SC entities such as cruise lines and port operators. Through the SC, the value of information is added.

The physical and service flow moves typically from suppliers to cruise passengers. Financial flow is usually directed in reverse to that of physical and service flow, while information flow is bi-directional. As the CSC is based on the movement of passengers and provision of cruise products/services to them, the process of the CSC can be articulated in detail based on the physical and service flow, i.e. distribution service, port service and onboard and shore service, explained as follows:

(1) Distribution service

The distribution service starts with cruise lines placing an order to suppliers or vendors. Confirmed by interviews, there are six kinds of suppliers in the CSC, including hotel, food and beverage, technical, corporate, concessionaires' products and fuel suppliers (Tsourakis, 2012; Veronneau *et al.*, 2015). Each kind of supplier may provide their products through different entities. For example, the high-value and essential products (such as spare engine parts) are directly shipped from suppliers to cruise ships via port agents (Tsourakis, 2012) rather than through distribution centres (Figure 3). Although the CSC involves both suppliers from MSCs and TSCs, the flexibility and reliability of suppliers are highly valued in the CSC to meet urgent and timely SC requests (Veronneau *et al.*, 2015). More specifically, the CSC suppliers are required to have buffer inventory and quantity-flexible contracts that are generally signed between cruise lines and suppliers, because cruise lines often revise their orders until calling at the loading port (Rodrigue and Wang, 2020).

Vendors contact suppliers and cruise lines to provide supplies as per request. As explained by an interviewee from a cruise line, vendors provide cruise lines with the latest products either from their own productions or from the local market and vendors source new or specific products as per determined by cruise lines' brand promise and promotional execution.

The interviews indicated three types of distribution networks in the CSC: (1) shipment from global or regional distribution centres; (2) direct shipment from suppliers in local markets; and (3) shipment from other cruise ships. Global and regional distribution centres are unique in the CSC. In comparison to TSCs, a luxury hotel usually can only accommodate 1,000 customers; however, it is common for a modern cruise ship with a capacity of 4,000 passengers and 1,500 crews. Such a significant number of customers would constantly consume large volumes of supplies, bringing pressure to smooth and continuous supply and requiring the establishment of cruise lines' distribution centres in the CSC. Also, the necessity of distribution centres is due to cruise lines' requirements to ensure a certain uniformity of products and maintain a high level of quality control. As revealed from the interviews, cruise lines source globally through their headquarters to gain cost reduction and quality guarantees and concentrate storage products in their distribution centres. Global distribution centres are mainly located near cruise lines' headquarters (e.g. Miami), while regional distribution centres are located in particular regions (e.g. Busan for East Asia). Containers are widely used for the shipment of products in the cruise industry. From distribution centres, cruise supplies are packed into containers as requested by different cruise ships and then delivered to the port to be loaded aboard. An explanation of this network was provided during an interview:

Containers of lobsters are shipped from Chile; containers of chicken are shipped from Argentina; containers of crabs are shipped from Russia. All these goods are imported and stored in the regional distribution centre. After confirming the purchase order placed by one ship, a container packed with a mix of these goods (of the same shipping condition) is delivered to the ship as requested.

As revealed from the interviews, direct shipment from suppliers in the local market in China consists of four types of products, food and beverage, hotel supplies, corporate or office supplies, and spare parts. After cruise lines initiate a procurement process, local suppliers or

vendors send their products to the cruise port, which bypasses the distribution centres of cruise lines (Figure 3).

Notably, the interview results revealed an interesting network associated with the process of “ship-to-ship” supply service. As merges and acquisitions within the cruise industry have resulted in a variety of cruise brands belonging to a few large cruise line groups, products are transported and delivered by other cruise ships of the same brand due to convenience (e.g. two vessels will load cargo at the same port) or because an order is urgent. The following quote from an interviewee gives an example:

For instance, M ship departs from Japan, and N ship departs from Southeast Asia. As both ships will call at Hong Kong, N ship may ask M ship to deliver some Japanese sake and give M ship some Singapore Bak kut teh.

This process is popular due to timesaving without customs clearance. After being approved by headquarters of cruise lines, the “ship-to-ship” process is usually billed by cash.

As revealed from the interviews, port agents are primarily responsible for husbanding and logistics services for cruise ships and passengers. They usually assist cruise ships to book the berth, arrange the quarantine inspection, immigration inspection, and customs clearance, and help coordinate and organise the schedule for the ship getting in and out of port, bunkering, freshwater and shore-side power service. In addition to port agents, the interview results identified a unique business entity called supply agent in China. As stated by an interviewee, supply agents own a special licence issued by the Chinese government, allowing them to transport goods onboard cruise ship in China. From the interviews, the distinction between port agents and supply agents is that port agents deal with the issues of cruise passengers and cruise ships, while supply agents concentrate on the issues related to products.

Taking into consideration the addition of supply agents, the flows in the CSC in China are revised accordingly. As shown in Figure 4, there is no direct financial flow that links vendors with cruise lines. Correspondingly, supply agents sign the contract of provisions with vendors directly. In other words, supply agents, instead of cruise lines, buy cruise supplies, indicating that cruise lines pay supply agents according to contracts. It is noted that supply agents rarely own transshipment warehouses in China; thus, vendors typically deliver supplies directly to the port, reflecting that the physical and service flow usually bypasses supply agents.

(2) Port service

Unlike a cargo port in the MSC that places value on the efficiency of handling cargos and the berthing capacity of terminals (Ugboma *et al.*, 2006), a cruise port values the connectivity of different forms of passenger transfer service, the efficiency of passenger clearance

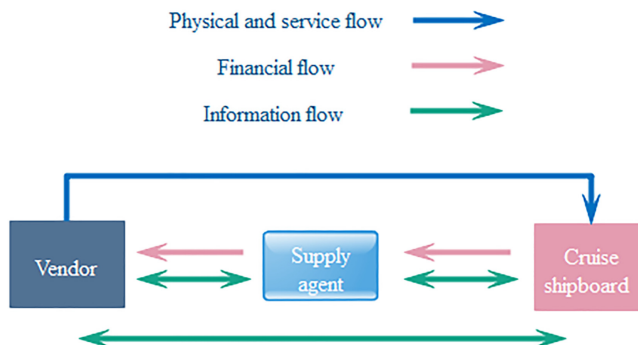


Figure 4.
Partial flows in SC with
supply agents

procedures and the capability of providing a pleasing environment for cruise passengers (Marti, 1990; Sun *et al.*, 2019; Papachristou *et al.*, 2020; Tseng and Yip, 2021). Particularly, cruise homeports need to be able to handle thousands of embarkation and disembarkation passengers from around the world, and cruise ports of call need to be able to convey disembarkation passengers taking shore excursions by reliable and convenient local transportation systems. As a result, the distance from a cruise port to a city downtown or tourist attractions (Castillo-Manzano *et al.*, 2014) and the convenience of transportation for passengers gathering and distributing are the most important factors for cruise lines' decisions on both a homeport (Lekakou *et al.*, 2009) and a port of call (Wang *et al.*, 2014); thus, these factors are of importance to generate economic activities for cruise destinations. Another difference in port services between the CSC and the MSC lies in the roles of ports. That is, a cruise port not only acts as a transshipment hub but also provides retail and entertainment services, which have a significant impact on a cruise line's decision on itineraries (Vaggelas and Lagoudis, 2010). In addition, unlike many MSCs (e.g. bulk shipping), advance bookings play a predominant role in the CSC. Thus, much of the operations information (e.g. schedule, plan, number of ships and itinerary) can be pre-determined ahead of time. As stated by Silva (2021), cruise ship information is available three years in advance; its future location, itineraries and even onboard menus are planned in advance. Accordingly, many problems in MSCs, i.e. insufficient ship berths or merchant ships queuing to dock at the port, would be less concerning to the CSC.

In comparison to TSCs, advanced logistical services of a cruise port are especially valued due to the narrow time window for turnaround. As revealed from the interviews, on the loading day, dozens of suppliers are waiting on the dock with various pallets of products. Between 4 and 10 h are usually allowed at a cruise port for the timely delivery of millions of kinds of products, while baggage handling, embarking and disembarking for 3,000–5,000 passengers should also be processed. Furthermore, it is essential that there are no supply shortages, as the cruise ship will not have the opportunity to re-supply until the next port. Such a narrow time window for turnaround requires higher efficiency of procurement and re-supply in a cruise port. As a result, even if many existing mass tourism destinations have good connectivity to airports and hotel amenities, ports in these areas would not be considered for cruise lines, because they cannot provide efficient logistics services for cruise ship turnarounds (Rodrigue and Wang, 2020).

(3) Onboard and shore service

In comparison to MSCs, a series of onboard activities and services (e.g. shows, bars, hotel accommodation, art auction and catering) are provided by cruise lines in the CSC. The cruise ship is not only a form of transport but the destination itself (Wood, 2004). As revealed from the interviews, cruise passengers spend most of their time onboard cruise ships, and cruise lines earn most from onboard activities such as gambling, drinking, and shopping. By enhancing opportunities for onboard revenue, cruise lines can even compete directly with land-based operators (Thomas, 2015), and this is regarded as one of the secrets of the cruise industry's success (Vogel, 2009). Cruise staff members can directly deliver these services to passengers, which means that cruise lines play a predominant role in the success of the CSC.

Shore excursions represent another significant source of income for cruise lines and an essential section of itinerary attractiveness (Johnson, 2006; Navarro-Ruiz *et al.*, 2019). Cruise passengers only have 6–8 h for onshore activities, but they place exceptional value on the services and arrangements related to shore excursions (Tseng and Yip, 2021). Though shore service is important for the holistic cruise experience (Navarro-Ruiz *et al.*, 2019), the problem is that complaints about the poor quality of shore excursions are common (Esteve-Perez and Garcia-Sanchez, 2015). To improve passengers' satisfaction, CSC players may work together

to diversify and enhance cruise onshore tourism programs (Wang *et al.*, 2014; Tseng and Yip, 2021) and provide sufficient time for sightseeing (Sun *et al.*, 2019).

Compared to MSCs, the interaction phase of the relationship between the service providers (e.g. cruise lines) and passengers is vital in the supply and delivery of services in the CSC. The perceived service is often different from the received service for cruise passengers in the CSC. Therefore, the quality of output (delivered service) in the CSC is sometimes directly linked to passengers' participation (e.g. passengers' feedback).

Compared to TSCs, issues associated with the CSC onboard and onshore service receive more media attention (Veronneau and Roy, 2009; Holland *et al.*, 2021). To cite an example, Norovirus happens anywhere in the tourism industry, but a case of cruise onboard food poisoning would significantly shadow the safety image of a cruise ship. Such an incident destroyed the industry's reputation and economic well-being. From the perspectives of passengers, safety and security concerns have a great impact on cruise passengers' cruising intentions (Bowen *et al.*, 2013; Pan *et al.*, 2021), destination selection (Brida *et al.*, 2013) and overall satisfaction (Andriotis and Agiomirgianakis, 2010; Ozturk and Gogtas, 2016). As a result, CSC players should take extraordinary measures to protect the word of mouth of the cruise industry. Any service failure may cause negative social media, which is much more severe than TSCs.

(4) An analysis of the CSC

Based on the discussion above, this research defines the CSC as follows:

A network of entities that engage in three stages of the process (distribution service, port service and onboard and shore service) through the supply of cruise products, financial and information services to the delivery of these services to cruise passengers.

A simplified CSC is depicted in Figure 5. The upstream CSC includes two groups of suppliers, suppliers for cruise ship operations and suppliers for passengers' accommodation, catering, recreation etc.

Cruise lines are focal firms in the CSC. They send requests to vendors or suppliers for replenishment related to passenger consumption and ship operations. Cruise lines provide accommodation, catering, shopping and recreation aboard, and design and arrange cruise

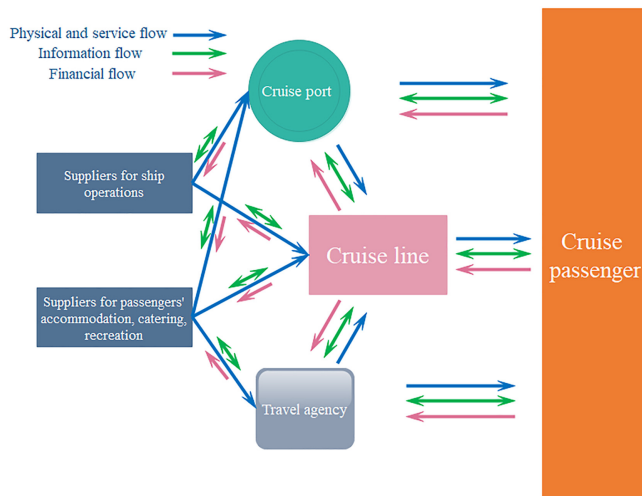


Figure 5.
A simplified CSC

products to meet personalised demands of passengers gathered by travel agencies or tour operators. They draw support from cruise ports to meet the requirement of passengers' embarkation and disembarkation, berthing, bunking, replenishment etc. Cruise lines also connect with cruise destinations, and passengers generate demand and economic contribution by shore excursions for local tourist attractions, local restaurants, traffic and others.

As focal firms, cruise lines should make good use of their predominant role in the CSC. Although cruise destinations and cruise ports are acquainted with local resources (e.g. scenic spot operation conditions), facilities and local traffic systems, they rely heavily on cruise lines to bring passengers. Therefore, cruise lines may aid destination areas and ports to provide suitable services by sharing the latest cruise market information and their passengers' profiles.

4.2 Characteristics of the CSC

To better understand the CSC, a detailed discussion of its characteristics is of great importance. The characteristics of the CSC in terms of demand-driven and supply-driven, globalisation, complexity and flexibility distinguish it from the MSC and the TSC, requiring particular attention.

(1) Demand-driven and supply-driven

The demand-driven characteristic widely exists in many SCs, e.g. make-to-order SCs and make-to-stock SCs. Like most industries, the demand-driven characteristic exists in the CSC, primarily associated with cruise supplies. The physical and service flow for cruise supplies (e.g. food and beverage) is activated by predicted or actual demands. As revealed from the interviews, the cruise shipboard team requests supplies of food and beverage based on the actual consumption and predicted stockout. This demand information is then sent via the cruise shore office to vendors or suppliers for production and package. This is a typical demand-driven phenomenon in the CSC, as widely witnessed in other SCs.

This study used the theory of [Hull \(2005\)](#) to explain the supply-driven characteristic of the CSC from four perspectives, product characteristics, resilience, a reverse bullwhip effect and matching supply and demand through a pricing mechanism.

First, cruise products are a type of perishable service, i.e. the service provided onboard and onshore in the CSC cannot be stored for future use ([Hauser and Truong, 2012](#)). On the sailing date, all unsold cruise cabins "perish". This perishability results from time constraints, product characteristics and deliverability driven by cruise lines and travel agencies to fill the cabins shortly before sailing to avoid unsold cruise cabins.

Second, business resilience within the CSC is managed by covering multiple cruise markets and global deployment, e.g. the Caribbean, Eastern Mediterranean and Asian markets. These multiple markets enable the CSC to have alternative markets to assure its supply continues at full operation rates if demand disappoints. As defined by [Hull \(2005\)](#), when demand falls, a resilient supply-driven chain would shift flows to other markets to maximise profits instead of adjusting operation rates. A classic example can be seen from the cruise ship *Norwegian Joy* that pulled out of China in 2018. As revealed by an interviewee, although the ship was specially built for China, Norwegian Cruise Line still moved it to America as they believed Alaska was a better market. Meanwhile, unlike other SCs, the CSC operates global deployment to ensure the success of a season. Like many other tourism products, cruise products have seasonality issues by nature. However, cruise lines use the re-positioning itineraries strategy to avoid off-seasons; for example, cruise lines deploy ships to the Northern Hemisphere in the summer peak season while moving ships to the Caribbean during winter.

Third, the reverse bullwhip effect of the CSC results from the fear of demand limitations (too few customers or inability to access customers). As passengers are highly significant to the CSC, the threat of their absence can trigger the reverse bullwhip effect. A simple example would be that cruise lines offer last-minute booking discounts to fill as many of their cabins as possible. In supply-driven chains, information sharing could be inefficient and exacerbate the reverse bullwhip effect (Hull, 2005). If the downstream SC entities are aware of the potential demand limitation from upstream entities, they could use this information to negotiate the price. On the other hand, if upstream entities realise customers' high demand for this product immediately, they can use this information to raise the price of the product (Hull, 2005). As revealed from the interviews, an example is the improper relationship between cruise lines and travel agencies when cruise lines charter their cabins to travel agencies in China. Not only could charterers re-negotiate the price after the cabins were sold, but also small secondary travel agencies could force primary travel agencies to lower their prices to fill the cabins. As described by an interviewee from a travel agency, the fear of demand limitations results in such abnormal relationship in practice

There are many small and medium-sized travel agents in the current cruise market in China. When the market condition is challenging, they may force the purchaser (the primary travel agency or wholesaler) [to lower the price]. For instance, we [as a wholesaler] purchased the cabin [from cruise lines] at a price of ¥3000. Typically speaking, we may sell [the ticket] at ¥3100 or ¥3200. However, someone [small and medium-sized agents] would tell you that now they have 200 customers willing to cruise, and those customers only would like to pay ¥2500. Do you want to sell it to us [at ¥2500] or not? Ironically, customers may also pay ¥3000 for the tickets.

The fear of unsold cruise cabins emphasises supply (maintaining flow) instead of demand (customer response). In other words, this fear of demand limitation starts from the upstream CSC instead of from customers, which differs from many SCs. It amplifies the power of information, which in turn empowers those entities which use this information to extract price concessions.

Fourth, decreasing price is a common way to activate product flows in supply-driven chains (Hull, 2005). Demand in the cruise business is created by marketing, pricing, branding and discounting strategies (Rodrigue and Notteboom, 2013). The trend of the present cruise industry is moving towards larger ships (Lau and Yip, 2020). Cruise lines increase their economies of scale and reduce per-passenger costs to shift the cruise products from the exclusive domain of the wealthy to be affordable to a broader customer base (Dowling, 2006; Thomas, 2015). Discounting cruise ticket prices in the CSC not only necessitates maintaining high occupancy rates but also helps to gain access to a new market. As stated by Sun *et al.* (2016), the ticket price of the SkySea Cruise Line's flagship Golden Era continued to decrease after entering the Chinese market, with prices down by 56%. As revealed in the interviews, cruise lines and travel agencies frequently reduced the price of cruise tickets to attract more customers and gain more revenue.

(2) Globalisation

The CSC exhibits the characteristic of globalisation. Globalisation is a vision of one world unit (Luthans and Doh, 2018), and the CSC is an excellent example of this vision. Thousands of passengers stay on a cruise ship, with everything from shopping malls, restaurants, hotels, bars, gyms and casinos. A cruise ship is no longer seen as a means of transport but as a floating resort or even a floating country. It could be regarded as a small world.

Also, Wood (2006) used "deterritorialised destination" to evidence this globalisation characteristic. The cruise ship is a tourist destination *per se*, not to mention the destinations that each cruise port calls. For the CSC, the world is a global destination, as most regions are also included on cruise itineraries (Perucic, 2007). Cruise lines geographically re-position

vessels to exploit complementarity between different destinations (Charlier and McCalla, 2006). The re-positioning ability enables the CSC to enter new markets and exit saturated markets with incredible speed and minimum cost, which is dreamt of in many TSCs as infrastructure investments are primarily huge and fixed (Veronneau and Roy, 2009).

The CSC covers disparate cruise destinations and cruise markets in the world by cruise ships calling at ports around the world. The degree of globalisation of the CSC is much higher than MSCs and TSCs because the SC operates worldwide both on the procurement and the sales side (Hauser and Truong, 2012). Cruise ship fleets either operate globally or change itineraries at intervals. Each cruise market has varying demographics, requiring specific procurement and sales. This dramatic relocating of all the service delivery, and retail and production capacity in the CSC (Veronneau and Roy, 2009) is less common in MSCs or TSCs. The cruise ships are like moving factories, showing the characteristic of deterritorialised destination- globalisation in the CSC. Taking procurement as an illustration, for each market, cruise lines source globally based on passengers' profiles. As revealed from an interview

Brazilian beef is of high quality, so we import Brazilian beef. Australian milk is the best, so we import Australian milk. We do the cruise business globally, from procurement, delivery, to payment.

A common phenomenon of a CSC is that the cruise ship is built in Europe, with its company headquartered in America, registered in Panama, crewed by citizens of various countries, cruising that generally follows the sun, and makes communication worldwide. To illustrate, firstly, unlike merchant ships, cruise ships can only be built in three to four European cruise shipyards (Statista, 2016). Secondly, the cruise industry is more sensitive to labour conditions compared to cargo shipping. Compared with the shipping industry, the Flag of Convenience is much more pronounced in the cruise sector. Despite the predominance of US-headquartered lines in the Caribbean, not a single large cruise ship operating in the Caribbean flies the US flag (Wood, 2000). Perucic (2007) agreed that there was a remarkable disproportion between national flag and flags of convenience: the USA has only three cruise ships under its own flag. Thirdly, unlike other ships, crews of a cruise ship could be from up to 50 countries, representing a "mini-United Nations". A cruise ship can be easy with a capacity of 4,000 passengers and 1,500 crews from various countries. Such a multi-national atmosphere is often marketed as a kind of cruise experience (Perucic, 2007) but is rare in MSCs or TSCs. As a result, the CSC involves supplying a broad range of products and services for different passengers from different countries, creating an international environment onboard and onshore.

Globalisation in the CSC also leads to the internationalisation of ownership. The pace of mergers and acquisitions in the CSC moves much faster compared to MSCs or TSCs. Transnational corporations can cover almost all cruise regions, which are rarely witnessed in other SCs. These amalgamations in the cruise sector decrease the territorial links to their countries of origin (Wood, 2000). This proves globalisation, as culture, social life and economic activity, is no longer rooted primarily in the physical geography of a place.

In SCs, the product of globalisation – global sourcing, separates factories (manufacturing production) from others across nations; whereas in the CSC, cruise ships are like "moving factories", deterritorialised destinations, representing globalisation as huge moving chunks of multi-national capitals.

(3) Complexity

The CSC is neither pure transportation-oriented nor pure manufacturing-oriented, making it highly complex. It provides various goods and services, with a combination of mobility and amenities, ranging from transportation akin to the MSC to the provision of accommodation, dining and entertainment akin to the TSC. The CSC not only requires the timely and safe

transport of passengers from one place to another and delivery of a variety of shore-based activities (Diakomihalis and Stefanidaki, 2011), but also a luxury onboard stay (e.g. stockout unacceptable and a strive for service quality) (Veronneau and Roy, 2009) and an array of businesses (e.g. running private ports or destinations), which are uncommon in MSCs or TSCs. As stated by an interviewee:

The cruise business derives from transporting goods and accommodating passengers. It includes running duty-free stores, casinos, and even owning private islands.

In terms of the variety of products, the CSC exhibits the characteristic of complexity. An interviewee described that:

The variety of products in the CSC is extensive, and the capital spent on cruise supplies is excessive.

The size of ships is steadily increasing, and the consumption of onboard services has become more diversified (Rodrigue and Wang, 2020). Tons of food and beverage are stocked aboard to keep thousands of cruisers constantly supplied, and storerooms aboard typically reserve a day or two's additional provisions to ensure that there will always be a sufficient margin on hand. Even purchasing tenderloin can be up to three million pounds (Veronneau and Roy, 2009). The complexity exists not only in the large economy of scale, but also in the requirement of provisions. A cruise ship needs to continually purchase tons of products with the same specification; after all, a cruise ship requires uniformity of supplies with high-quality control and food safety. This complexity in procurement is more significant than MSCs or TSCs.

The complexity in handling wastes can be seen as another viewpoint to show the complexity of the CSC. A medium-size cruise ship with 3,600 passengers can generate 2,358 m³ of greywater and treated sewage, 84 m³ of oily waste and 266 m³ of solid waste weekly (Kotrikla *et al.*, 2021). Even though cruise ships are less than 1% of the world merchant fleet, they produce 25% of waste produced by merchant ships (Butt, 2007). The management of these wastes is far more complex, and cruise port reception facilities should be able to handle all these waste types (Slišković *et al.*, 2018).

A cruise ship is similar to a floating community. With thousands of people isolated together, all kinds of issues may occur to disrupt the best service delivery, from airlifting supplies to the port of call due to late arrival at the turnaround port to altering itinerary due to a medical emergency. This complexity is rarely witnessed in MSCs or TSCs because the CSC requires to handle all these complex situations to ensure perfect guests experience. Furthermore, the re-deployment of cruise ships increases the level of planning complexity (Diakomihalis and Stefanidaki, 2011). A CSC needs to ensure a smooth operation under a continuous shifting of supply requirements within different geographical areas. This complexity in SC planning due to frequent re-deployment based on market demand is more common than MSCs or TSCs.

(4) Less flexibility

As revealed from the interviews, less flexibility can be explained from two perspectives. First, the time frame for replenishing cruise supplies and cruise ship schedules for the CSC is less flexible, given the fixed itinerary and short turnaround window (Qu *et al.*, 2020). In each port, cruise ships only have 4–10 h of loading time. Given loading activities can involve more than 100 different stakeholders (Ros, 2019), late arrival at ports reduces the time available for provisioning and may cause dissatisfaction amongst the shore-going passengers (Hauser and Truong, 2012). One interviewee agreed with this characteristic for replenishing cruise supplies and commented that space limitations around ports, as well in loading bay areas only allow specific time frames for each vendor or forwarder to deliver their products. Any delay may cause spoilage, jammed loading areas or even delay of a ship.

The quality, quantity and safety of cruise ship supplies have to be choreographed as planned. There will be no opportunity to change supplies once a cruise ship departs from the turnaround port (Rodrigue and Wang, 2020), which is much different to MSCs and TSCs. As argued by Veronneau and Roy (2009), there is more flexibility for mistakes in other tourism settings, but a cruise ship moves constantly and has no second chance to fix mistakes if missing the delivery. One interviewee from a cruise line agreed with this opinion:

A cruise ship is self-contained once sailing out; if we do not have what we want, we may never ever have it until the next port (in some cases, we might only have it in certain ports).

Freshness factors also impose limitations on CSCs. Products should be pre-planned to avoid perishing and contamination. The procurement and delivery process for perishable products needs to be carefully monitored to ensure quality and safety (Rodrigue and Wang, 2020). The long replenishment lead time for supplies' procurement exacerbates this characteristic. Most supplies are shipped out from distribution centres not only to strengthen safety and security but also to provide standardisation of experiences for passengers (Weaver, 2005). As supplies are transported in the shape of containers, it may take months to deliver these supplies aboard. One interviewee agreed with this opinion and commented that many products need to be shipped from America. Another interviewee from a cruise line explained further as follows:

For supplies, we basically place an order in containers. It takes 90–120 days from ordering to receiving these containers of products. Forgetting to order means you would not have these products in the following 90 days. Then you have to pay an extra US\$5000–10000 for the express service (e.g. airlifting).

The long booking window in terms of procurement of the CSC is unparalleled to MSCs or TSCs. As for both MSCs and TSCs, supplies would not have to be primarily delivered from a centralised hub, while cruise ship procurement is much more stringent (Zhang *et al.*, 2009).

Second, in terms of replenishment procedures, cruise supplies are highly fixed. As cruise supplies are generally under strict control and accessibility, rigorous regulations should be passed before being delivered aboard. When faced with order changes or miss supplying, cruise supplies are restricted by time and procedures for customs clearance, inspection and quarantine. An interviewee explained such highly fixed and less flexibility of cruise supplies as follows:

Authorisation is needed for storage as most of the storage areas are in either port areas or bonded areas. Moreover, these places usually have limited access requiring a pre-application process. Supplies cannot just change if there is any wrong or missing order.

Table 4 presents the commonalities and differences among the three SCs, which provide a better understanding of the CSC.

5. Specific characteristics in the Chinese CSC

5.1 *The complicated procedure of cruise supplies transshipment*

Several policies and regulatory systems hinder the smooth operation along the CSC in China. A typical example is the complicated procedure of cruise supplies transshipment, concerned by interview participants. On the one hand, the fast-developing Chinese cruise market requires a considerable number of cruise supplies, and dozens of products are manufactured in China. On the other hand, the mode of “import in full and supply in batches” is forbidden in China, which leads to cruise lines choosing South Korea or Japan instead of China for replenishment and transshipment. In simple terms, this mode means cruise lines purchase products in advance, import them into warehouses for storage as a whole, and finally supply them to cruise ships separately as per request by cruise lines. Under the current circumstance,

Commonalities and differences	CSC	MSC	TSC
Entities	Suppliers for cruise ship operations, suppliers for passenger service, distribution centres, vendors, port agents, cruise port operators, cruise lines, travel agencies or tour operators	Shippers, freight forwarders, shipping companies, ports, land transport operators and consignees	Tier 2 suppliers (e.g. food supplier and drink supplier), Tier 1 suppliers (e.g. accommodation suppliers and transportation suppliers), travel agencies or tour operators and customers
Distribution service	Highly value the flexibility and reliability of suppliers	–	Value relationship with travel agencies or tour operators
Port service	<ul style="list-style-type: none"> Value the connectivity of different forms of passenger transfer service, the efficiency of passenger clearance procedures and the capability of providing a pleasing environment for cruise passengers Not only act as a transshipment hub, but also provide retail and entertainment services With an advance booking for a fixed schedule months or even a year early Advanced logistical services are especially valued 	<ul style="list-style-type: none"> Value the efficiency of handling cargos and the berthing capacity of terminals Act as a transshipment hub There is relatively less advance booking; thus, shipping companies face problems of insufficient ship berths or merchant ships queuing to dock at the port 	Many ports in mass tourism destinations are not considered for cruise lines because they cannot provide efficient logistics services for cruise ship turnaround
Onboard and shore service	<ul style="list-style-type: none"> The interaction phase of the relationship between the service providers (e.g. cruise lines) and passengers is vital in the supply and delivery of services in the CSC Issues associated with the CSC, onboard and onshore service are under incomparable media attention 	–	<ul style="list-style-type: none"> The quality of output (e.g. delivered service) in the TSC may also be directly linked to customers' participation (e.g. customers' feedbacks) A case of Norovirus would not significantly shadow the safety image
Supply-driven and demand-driven	Relatively robust to the disturbance of the economic environment	Shipping activities are derived from trade and demand	High demand derived and being sensitive to the economic situation

Table 4. The commonalities and differences between the CSC to the MSC and the TSC

(continued)

Commonalities and differences	CSC	MSC	TSC
Globalisation	<ul style="list-style-type: none"> • The re-positioning ability enables the CSC to enter new markets and exit saturated markets with incredible velocity and minimum cost • Dramatically relocating all the service delivery, retail and production capacity in the CSC • Cruise ships can only be built in three to four European cruise ship shipyards • The Flag of Convenience is much more pronounced • More sensitive to labour conditions • The pace of mergers and acquisitions in the CSC moves much faster 	<ul style="list-style-type: none"> • Not relocating all the service delivery, retail and production capacity • Merchant ships can be built in several shipyards • The Flag of Convenience is common but incomparable to that in the CSC 	Relatively difficult to enter and exit markets because infrastructure investments are primarily huge and fixed
Complexity	<ul style="list-style-type: none"> • A CSC not only requires the timely and safe transport of passengers from one place to another and delivery of a variety of shore-based activities but also a luxury onboard stay and an array of businesses (e.g. running private ports or destinations) • The consumption of passengers is diversified • Need to continually purchase tons of products with the same specification • A cruise ship is similar to a floating community • Needs to ensure a smooth operation under a continuous shifting of supply requirements within different geographical areas 	Requires the timely and safe transport of cargo from one place to another	Delivery of a variety of recreation service

(continued)

Table 4.

Commonalities and differences	CSC	MSC	TSC
Less flexibility	<ul style="list-style-type: none"> • Less flexible given the fixed itinerary and short turnaround window for both passengers and cruise ship supplies • Less flexible because the ships move constantly, and there will be no second chance to fix mistakes • Cruise supplies are highly fixed in terms of replenishment procedures • Long-term arrangement in terms of procurement from a centralised hub 	<ul style="list-style-type: none"> • Relatively flexible time for loading and unloading cargos with fewer stakeholders involved • Do not need a long-term arrangement for shipment from a centralised hub 	Have a second chance to fix mistakes if missing the delivery

Table 4.

only the mode of “import and supply in full container load” is permitted in China, which means containers of supplies cannot be opened and mixed before being delivered aboard. One interviewee explained with an example as follows:

There is one container of beef, and three ships are waiting for the beef. The reason why a cruise line still prefers shipping the beef to Japan or South Korea instead of China for replenishment is that once this container is opened, it is regarded as an import business in China. This means that the import procedure should be followed including quarantine inspection [and customs clearance] for the beef that requires extra time. Subsequently, the beef in this container has to be separated into three units [for three cruise ships]. But when these three units are delivered aboard, it is regarded as an export business; thus, an export procedure needs to comply with.

Although China also launched a pilot scheme in Xiamen for bonded supplies to international cruise ships in 2018, as an interviewee indicated, this is only a single case and this scheme has not been expanded around the country. The procedures are still complex for cruise lines.

5.2 The wholesale model

As explained previously, cruise lines are focal firms in the CSC. However, the leading role of a cruise line is exceptionally weak in China because of the so-called wholesale model or charter model. This model means that cruise lines charter their ships’ cabins to one to several travel agencies. Then, travel agencies sell the cabins directly to customers, which bypass cruise lines. In most parts of the world, cruise voyages are sold by travel agencies on commission or direct sales from cruise lines’ websites. However, in China, more than 90% of cruise voyages are distributed through chartering (Sun and Ni, 2018; Chu and Hsu, 2021).

The wholesaler model has brought many problems. Under this model, most communication and marketing to customers are out of cruise lines’ control. Cruise lines shift the marketing power to travel agencies, and travel agencies sign contracts with customers directly. As an interviewee described

Cruise lines are unable to touch customers, especially in the early years. From customers’ embarkation to disembarkation, the whole process is handled by travel agencies.

Except for the onboard service, all the shore-based activities, marketing and promotion highly rely on travel agencies. This model dampers cruise lines’ proper strategic deployment

and cruise product design, which may result in cruise lines misjudging the market condition and over-deploying ship fleets to the Chinese cruise market. As an interviewee from a cruise line indicated

Take the sales information as an example, we lose control of customers, because this information is controlled by travel agencies. We do not know the customers' profiles. We even do not know how many tickets were sold on each day before sailing. Besides, we do not know at what price did the customers buy these tickets.

Moreover, passengers cannot receive sufficient information (e.g. price information) from cruise lines in China but choose the cheapest cruise products offered by travel agencies in the market, which accelerates the price war in China.

The price war caused by the wholesaler model lowers the quality of products and services in China. Cruise lines sign contracts with travel agencies for securing the cabins months ago before sailing. As revealed from the interviews, either these contracts are non-refundable, or travel agencies have to pay a fine if they fail to meet the pre-determined requirement. As a result, travel agencies frequently reduce the price of cruise products, aiming to sell out their booked cabins as many as possible. An extremely low cruise fare may even reach US\$ 7 per person per day (Chu and Hsu, 2021). With such a low price for a cruise ticket in China, food and service quality would be decreasing. This low-price competition destroys high-end features of cruise products and leads to a disappointing experience (Lv *et al.*, 2018).

To solve this problem, cruise lines may try to reduce their reliance on this model by increasing the percentage of their direct sales. As argued by a senior manager in a cruise line

Royal Caribbean International opens a few stores on land, specialising in selling their cruise products to customers directly. It devotes every effort to direct selling.

Furthermore, travel agencies may return to the real intermediate role in the CSC – merely assisting cruise lines to sell tickets instead of gaining too much market power. Meanwhile, cruise lines may take the leading position back to the roles of focal firms in the CSC – determining the price and the market rules.

6. Conclusion and implications

Through reviewing the existing literature and conducting an empirical study in China, this research conceptualises the CSC by examining its key entities, processes, activities and characteristics with a comparison with MSCs and TSCs in the discussion and provides a better understanding of the CSC. Two specific characteristics faced by the CSC in China are also identified, which need further investigation.

The findings of this research have several managerial and academic implications. This research is a starting point for looking at the cruise industry from an SC perspective. It is beneficial to practitioners in the cruise industry to better understand the concept of the CSC. By comparing the CSC with MSCs and TSCs, this research draws interest to practitioners to view a CSC not only from the perspective of the cruise industry but also from tourism and transport.

The academic implications of this research lie in three aspects. First, as supply-driven characteristic is rarely studied in the SC literature, future research could investigate the properties of supply-driven chains. Apart from four perspectives (i.e. product characteristics, resilience, a reverse bullwhip effect, and matching supply and demand through a pricing mechanism) proposed in Hull (2005), it is necessary to examine whether secrecy can be the additional property of a supply-driven chain. Although information sharing is deemed as a common SCM strategy, secrecy is common in the CSC. For example, in the aforementioned improper relationship between primary and secondary travel agencies, primary travel agencies may keep the secrecy of sales information instead of sharing it with other SC entities (e.g. secondary travel agencies) to avoid this issue. Thus, researchers could investigate the use of

secrecy in supply-driven chains. On the other hand, previous studies have identified that supply saturation, as opposed to demand saturation, can restrict the development of a CSC (Rodrigue and Notteboom, 2013). As evidenced, creating more ship capacity is one of the key factors to increase the number of cruise passengers, and cruise business growth is limited more by capacity than demand (Rodrigue and Notteboom, 2013; Micallef, 2018). As a result, further research may validate whether supply saturation could be regarded as an additional proposition of supply-driven chains, which may enrich the understanding of supply-driven chains.

Second, there is an inconsistent view on demand uncertainty of the CSC between literature and the finding of the empirical study. Scholars such as Papathanassis *et al.* (2012) and Tsourakis (2012) argued that demand uncertainty is a unique characteristic, while interviewees disagreed. Most processes of the CSC need to be pre-scheduled. The total number of passengers is acknowledged weeks ahead because the passenger list needs to be inspected by the immigration office in advance. The itinerary, as well as the port of call, is pre-set, and the cruise ship berth is usually booked half a year ahead. Also, the maximum number of expected passengers is limited by the ship capacity. The demand could be expected as many processes are determined in advance; thus, the demand uncertainty is a characteristic of the CSC that remains to be discussed.

Third, as a variety of risks disrupt the CSC severely (e.g. COVID-19), future research could focus on applying risk management in the CSC, for instance, through an empirical study or a quantitative method to evaluate significant risks in the cruise industry from an SC perspective.

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Appendix

Categories	Codes	Interviewees	Numbers of interviewees
Entity	Supplier	TIP04, TIP06, TIP07, TIP08, TIP09, TIP11, TIP14, TIP15 and TIP22	22
	Distribution centre	TIP07, TIP08, TIP09, TIP15, TIP18 and TIP20	
	Vendor	TIP08, TIP09 and TIP22	
	Port agent	TIP04, TIP06, TIP07, TIP09, TIP11, TIP15 and TIP16	
	Cruise port	TIP01, TIP03, TIP04, TIP05, TIP06, TIP07, TIP09, TIP11, TIP12, TIP15, TIP17, TIP18, TIP20 and TIP22	
	Cruise line	TIP01, TIP04, TIP05, TIP06, TIP07, TIP09, TIP11, TIP12, TIP13, TIP14, TIP15, TIP16, TIP20 and TIP22	
	Travel agency	TIP01, TIP05, TIP07, TIP08, TIP09, TIP11, TIP13, TIP14, TIP15, TIP18 and TIP20	
	Cruise service provider	TIP01, TIP02, TIP04, TIP12, TIP15 and TIP19	
Process and activity	Local authorities (the maritime authority, customs, the immigration and quarantine authority etc)	TIP01, TIP03, TIP09, TIP10, TIP11, TIP16, TIP20, TIP21 and TIP22	11
	Distribution service	TIP04, TIP06, TIP07, TIP08, TIP09, TIP11, TIP15, TIP16, TIP18, TIP20 and TIP22	
	Port service	TIP01, TIP03, TIP04, TIP05, TIP07, TIP09, TIP10, TIP11, TIP12, TIP13, TIP14, TIP15, TIP17, TIP18, TIP19, TIP20, TIP21 and TIP22	
	Onboard and shore service	TIP01, TIP04, TIP05, TIP08, TIP09, TIP11, TIP13, TIP15, TIP18, TIP19 and TIP20	

Table A1.
The interview analysis results

(continued)

Categories	Codes	Interviewees	Numbers of interviewees
Characteristics	Demand-driven and supply-driven	TIP01, TIP04, TIP05, TIP08, TIP09, TIP12, TIP13, TIP14, TIP16, TIP17 and TIP18	11
	Globalisation	TIP01, TIP04, TIP06, TIP07, TIP08, TIP09, TIP11, TIP12, TIP13, TIP15, TIP19 and TIP20	12
	Complexity	TIP01, TIP03, TIP04, TIP05, TIP06, TIP07, TIP08, TIP11, TIP13, TIP16, TIP20 and TIP22	12
	Less flexibility	TIP03, TIP07, TIP08, TIP09, TIP10, TIP11, TIP12, TIP14, TIP15, TIP16 and TIP22	11
<i>Specific characteristics in the Chinese CSC</i>			15
The complicated procedure of cruise supplies transhipment		TIP01, TIP02, TIP06, TIP08, TIP09, TIP11, TIP13, TIP18, TIP20 and TIP22	10
The wholesale model		TIP01, TIP04, TIP05, TIP08, TIP11, TIP12, TIP13, TIP14, TIP17, TIP18, TIP19, TIP20 and TIP22	13

Table A1.

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