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ORIGINAL PAPER

The trade patterns of the South China Sea during the Song period

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Abstract
This paper aims to outline two different trade patterns in the South China Sea during the Song period by examining the distribution pattern of cargos on the Intan, Cirebon, Nanhai No.1 (南海I号) and Quanzhou Bay 泉州湾 wrecks. Through the detailed analysis, it is argued that the voyage of some merchant ships would be conducted at the request of a single authority, from a few available, who handled bulk selling while the remaining spaces on the ship would be leased to some individual traders who did retail business. The major cargo on board would be aimed toward a single directional destination, as is represented by the Inan and Cirebon wrecks. In other cases, the sea-going journey would be a joint operation involving multiple traders and the major cargo would be handled by peddlers and possibly sold at a number of ports-of-call, as is seen with the Nanhai No.1 and Quanzhou Bay wreck.

Keywords Trade patterns · South China Sea · Shipwrecks · Cargo distribution · Song Period

The South China Sea is the first leg of the long-distance tans-Asian trade route that led from China to the Mediterranean. Judging from the recovered shipwreck data and objects brought to the surface, from the late ninth century onward, the trading circle involved merchant ships originating in China, Southeast Asia and the Middle East, and was fed with the manufactured objects as well as raw materials originating from a vast territory (Qin 2007; Li 2001; Manguin 1993). How was the trade of each different types of merchandise managed, and for ships that carried mixed cargos, how was the trade conducted?

So far, twenty-five wrecks and wreck sites from the South China Sea and areas directly to the east and south dating from ninth to thirteenth century have been salvaged or surveyed and published reports or on websites. Besides the Belitung wreck which was an Arabic merchant ship (Flecker 2010: 101–119), the others with identified origins are sourced to China or Southeast Asia. This paper discusses two different trading modes in the South China Sea that we identify during the Song 宋period (AD 960–1279), namely the single authority pattern and the peddler trade pattern. We do this through the analysis of the distribution of cargo on four major shipwrecks—Intan, Cirebon, Nanhai No.1 (南海I号) and Quanzhou Bay 泉州湾 wrecks.

1 The distribution of cargos on the Intan and Cirebon shipwrecks

The Intan wreck, salvaged from the northwest region of the Java Sea (Fig. 1), was an early-mid tenth century Southeast Asian merchant ship carrying a mixed cargo. According to the excavation report of the Intan wreck (Flecker 2002: 29–120), it carried a wide range of Southeast Asian and foreign products. Artifacts include such bronze ritual articles as figurines, vessels, scepters, bells, and molds, some at least of which appear to have been of Indian origin. Finds of Chinese origin include ceramics, copper coins, bronze mirrors and iron articles. Other artifacts include Middle Eastern glassware, Southeast Asian ingots of lead, silver, tin, and bronze, foodstuffs such as candle-nuts, and other organic material including tiger bones, sambar antlers, an elephant tooth and tusk, worked ivory pieces, and pieces of benzoin, with the vast of majority of the recovered artefacts comprised of ceramics (7309 pieces), metal ingots (including bronze (865), tin (793) and copper alloy (479)), door fittings (596) and mirrors (652). Judging from the figures in the excavation report, it is apparent that the distribution of the major cargos mainly follows two different patterns: first, some artefacts occurred

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Fig. 1 The locations of the Intan and Cirebon wrecks

relatively uniformly along the length of the site, such as the door fittings and tin ingots, or second, they were centered around one or several separate regions, such as seen for the mirrors and ceramics. Because of the shapes of the fittings, which were not loose items of cargo but rather were attached to completed doors (but could roll once the door disintegrated) and the buoyancy of the doors them (which allowed displacement by current), the original placement of the door fittings is difficult to conclude (Flecker 2002: 45–51). Therefore, the other three objects will be the main focuses.

The tin and bronze ingots and copper items each feature separate distribution patterns in which each category of object was close to each other. Great quantities of tin ingots, packed densely, were found at the southern end of the wreck, but there were also substantial numbers at the far north as in Grid H, implying that tin was stowed along the full length of the vessel.[1] According to the excavation report, in many cases, pyramidal tin ingots were recovered stuck together, base to base with all edges aligned, which is sufficient to conclude that they were stowed in this manner. Each layer of ingots must have been stacked with alternate ingots placed upright and upside-down in order to fully utilize the hold space (Flecker 2002: 80). An interesting finding regarding the distribution of tin ingots is that there is a U-shaped pattern at the southern end of the site, an indication of tin being stowed around another commodity and at the bottom of the hold (Flecker 2002: 82). The distribution of bronze ingots, on the other hand, peaks in two separate regions: the southern end (Grid C10) and the midship north (Grid F7) (Flecker 2002: 79). Grid C10 is also the same area where tin is concentrated and hence bronze and tin ingots were likely stowed together. When discussing the overall distribution of the bronze ingots, it is important to bear in mind that some 196 kg of bronze ingots were recovered prior to the documented earlier excavation, with their recovery reputedly conducted in Grid E and F: with a mean weight of 2 kg, then around 100 pieces of bronze ingots would supposedly have been located at the central area of the wreck site. If this is true, then there would have been more of a continuum between the two peaks in the distribution. Scrap and sheet copper alloy follows a similar distribution pattern to the bronze ingots, with a higher concentration at the southern end of the site, but also extending to just north of midships, and slightly to the west (Flecker 2002: 80). It is reasonable to conclude that scrap bronze had been stowed down low in the ship, together with the bronze and tin ingots. as their weight stowed at midship instead of at the far ends would serve as ballast to stabilize the ship under sail. The higher concentration at the southern end is more likely due to the fact that the wrecked ship was orientated northwest/southeast.

Liebner (2009: 44) once has argued that ownership is reflected by the placement of cargo batches. If the load was owned, managed, and to have been marketed by a number of merchants, then the composition of items found in (any) certain compartments should noticeably vary from the arrangement of objects un-earthed from (any) other sections. Such arrangements would result in a number of individually

[1] The artifact concentrations at the south end, also seen in the distribution of door fittings, is probably due to the orientation of the ship, which means that the south end of the ship hit the seabed first, causing the objects on board to shift to the south. However, if great numbers of items still were located at the far north end of the wreck site, then they clearly were stowed along the full length of the ship.

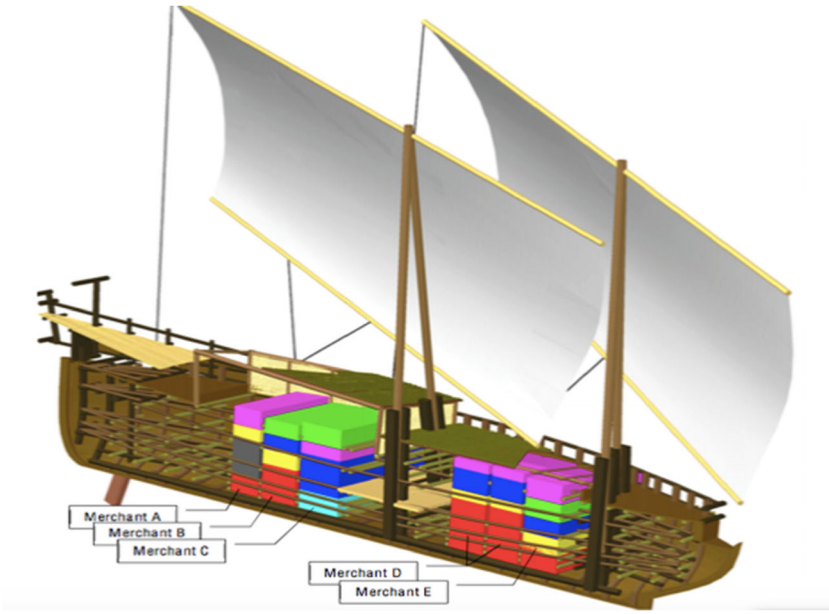

Fig. 2 Proposed "vertical stacks" of cargo consignments (after Liebner 2014: 458, Fig. 4.2-2)

composed "vertical stacks" of cargo consignments (Fig. 2). On the other hand, if the load was owned by a single authority, the stowage design should follow the requirement of seamanship, which would lead to a "horizontal stack" of cargo (Fig. 3). One should question the likelihood of this argument's outcomes. Indeed, under certain circumstances, such as of products were loaded from different ports and from different resellers, the composition of a certain type of cargo handled by a single authority could vary in provenance, quality and quantity between every compartment. On the contrary, for the sake of saving space, cargo belonging to different owners could be packed densely and uniformly with the use of other ownership indicators such as wooden tags or ink marks, instead of relying on location in the ship to mark ownership. Nevertheless, in the case of the metal ingots and copper alloy cargos on the Intan wreck, such indicators were absent, and their stowage pattern, which was along the full length of the vessel or centered around the midship as ballast, seems to support the assumption of the "horizontal stack." Therefore, the trading of these metals was most likely organized by a single merchant or only a few merchants.

The distribution of mirrors (255 Indonesian mirrors, 302 Indonesian mirror handles,[2] and 95 Chinese mirrors) shows quite different patterns. The distribution of Chinese mirrors compares closely to that of Indonesian mirrors. In both cases, there are two separate consignments, one at the end of the site and the other just north of center, and in both cases, the northern concentration is higher (Flecker 2002: 59). In the southern area, Chinese mirrors are concentrated in Grids C8 and C10, whereas Indonesian mirrors are concentrated in Grids B8, B9 and C10. In the northern area, the Chinese mirrors are concentrated around Grid F6, whereas the Indonesia mirrors centered around F7 (Flecker 2002: 59–60). Slight differences in peak concentration may indicate that the mirrors were stored in separate chests, as would be expected, but in the same vicinity. The fact that the Indonesian mirrors and Chinese mirrors were stowed at probably two different consignments respectively suggest that there were at least two merchants trading in the same kind of commodities.

Compared with the cargos mentioned above, the distribution of ceramics is more complicated. The ceramics were spread out in a circular fashion, leaving an area almost devoid of ceramics (Flecker 2002: 119). This unusual distribution pattern is probably a consequence of the wrecking process, during which the ceramics shifted to the west, leaving the area where the vessel once lay relatively empty. As for the longitudinal distribution, overall speaking, the peak concentration occurred in the north and south. However, according to Flecker (2002: 120), during the earlier undocumented recovery, considerable quantities of ceramics had previously been removed from the central grid area. Taking that into account, the concentration would not have been quite so pronounced. On the other hand, the major types of ceramics on board developed different distribution patterns. Brown/green glazed pots, the predominant ceramic type (with 4,855 brown ware pots out of the total of 7,309 pieces of ceramics recorded), were recovered in substantial quantities along the full length of the site. Considering earlier recoveries, they may have been packed fairly uniformly from the south to midships, but a larger number were certainly packed to the north (Flecker 2002: 120). Fine-paste bottles and kendis (pouring vessels), were packed in the bow and stern areas, but not in between (Flecker 2002: 119). A total of 795 Qingbai 青白 wares were

[2] Mirrors and their handles mostly were found separately because the mirrors and their handles were cast separately and then brazed together (Flecker 2002: 58). Only one mirror had its handle still attached.

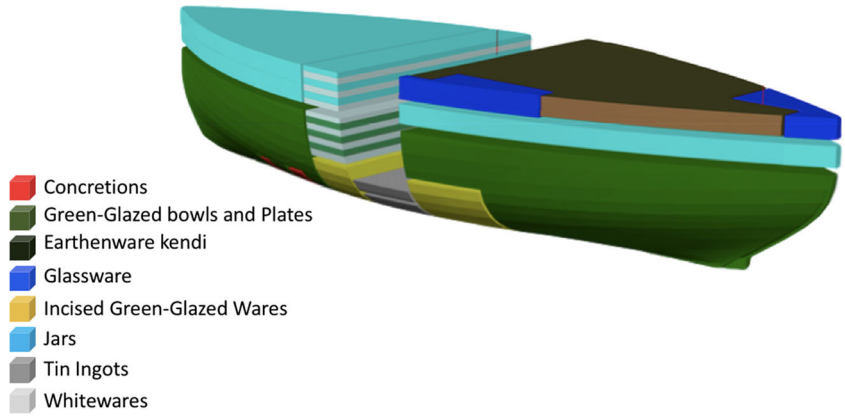

Fig. 3 The "horizontal stack" of the main consignments of cargo on the Cirebon wreck (after Liebner 2014: 458, Fig. 4.2-3)

registered in the excavation report, among which 639 are small and very small dishes (Flecker 2002: 115), but no overall figures are available. The distribution of these Qingbai wares shows a markedly different distribution from the fine-paste wares. The majority of the small dishes were recovered from midships north, although there was an isolated concentration to the south; the very small dishes appear to have been stowed all along the ship (Flecker 2002: 119–120). A total of 1,051 Yue 越 wares were registered in the excavation report, among which 148 are ewers and 297 are jars (Flecker 2002: 106), but no overall figures are available. Yue wares were also found along the full length of the ship, but different shapes varied in their distributions: medium sized ewers were found from midship to south; small size ewers were found exclusively in the very north of the site; jars decorated with a fishbone pattern were found to the very south and from midships north, but none were found in the between; and lotus decorated jars occur fairly uniformly all along the site (Flecker 2002: 119).

Based on the description of the distribution patterns of the ceramics, we know that even though ceramics were found along the full length of the ship, the cargos were not packed uniformly. The stern area (the south end of the wreck site) was loaded with brown ware pots, fine-paste wares, Qingbai wares, Yue-type jars with decoration pattern of fishbone and lotus, and medium sized ewers. At the bow area (the north end of the wreck site), some of the types mentioned above such as the Qingbai small dishes and Yue-type jars with the fishbone pattern were not seen, but the Yue-type small size ewers were found exclusively in this region. Moreover, for the items stowed at both the stern and bow areas such as the brown ware pots, they differed in qualities. The midships area is devoid of fine-paste wares and mainly packed with Qingbai wares, Yue-type jars, and ewers. There is also a difference between the midship north and south. It seems that the composition of ceramics found in certain compartments noticeably vary from the arrangement of objects un-earthed from other sections. Considering that the ceramic cargos were probably picked up at an entrepôt port in south-eastern Sumatra,[3] this difference is likely because the compartments were leased to several merchants who oversaw the trade of different types of ceramics. It indicates that the cargos were owned and marketed by individual merchants, rather than a single authority.

Besides the major merchandises mentioned above, there were also goods for traders in Middle Eastern glass beads and glass wares, as well as 44 human bones found on the wreck. These human bones may be indicative of the ship being used in human trafficking, as usually just one or two people would not be able to escape the sinking ship, so it seems that several people had remained trapped within the ship, and a possible reason for this would be that the ship was carrying slaves (Flecker 2002: 93). It appears that on the ship, the trade of metal ingots and alloys was organized by a single or few authorities, while the other commodities were owned by different merchants. It is reasonable to assume that the metals, tens of thousands of them packed densely at the bottom of the ship, was heading to a fairly limited number of destinations, possible Java, while the other merchandizes including ceramics might be traded at an extensive number of ports-of-call during the voyage to Java or sold at the final destination with the metals as well. Java may have been this final destination because Java is virtually devoid of commercially extractable mineral deposits. Java needed to import all the base metals it needed: gold and silver for currency, iron for tool making and cooking vessels, and copper and tin for casting bronze statues and vessels (Flecker 2002: 81).

Turning to the Cirebon ship, a mid-late tenth century Southeast Asian merchant ship salvaged from the north Java coast (Fig. 1), the overall arrangement of its cargo is similar to that on the Intan ship. Chinese ceramics, which dominate the merchandizes found, accountting for 75% of the ca. 500,000 retrieved items, have been found uniformly along the full length of the ship. Other items, including Fatimid glassware from the Middle East, many thousands of pearls and precious stones probably from Indian Ocean ports, several hundred kg of raw Afghani lapis lazuli, lead and tin ingots, and a wide

[3] This assumption is based on the sinking location, the mixed cargo and the cargo stowage pattern (tin was stowed along the full length of the ship, and beneath the ceramic cargo).

collection of aromatic substances, were distributed around one or several separate consignments (Liebner 2009: 16–23).

Analysis and reconstruction of the wreck assumed that the Cirebon ship's hold was divided by crossbeams into sections similar to the compartments apportioned to individual merchants described in Chinese sources and seen in Chinese wrecks, such as the Quanzhou Bay and Nanhai No.1 (Liebner 2009: 33). However, the available data of the distribution of ceramics cargos on the Cirebon ship indicates that the stowage pattern followed the requirements of seamanship, instead of reflecting the different ownerships. Most of the ceramics (75%) on the Cirebon wreck were various types of green-glazed bowls and plates (Liebner 2009:42): these were packed densely in the lower hold. According to the excavation report, the vast majority of the various kinds of bowls was found inside the area delimitated by the hull's remains, and thus initially must have been stored in the deeper sections of the ship's hold, while the bulk of the other types of ceramics were unearthed in areas surrounding the wreck, and hence most probably had been loaded on top of the tightly stacked bowls (Liebner 2009: 38). Thus, the green-glazed bowls and plates were topped by the lighter, less compact consignments of jars, ewers, and kendis (Fig. 3). There is no significant difference on the longitudinal direction as we have observed in the Intan ceramic distribution. The only identifiable "vertical stack" of specific pottery that might indicate an individual consignment is the concentration of white wares stowed behind the "tween-deck" (the space between the upper deck and the lower cargo hold in the hull of a vessel) (Fig. 3) (Liebner 2014: 301–302). However, Liebner argues that this pattern could also indicate an "opportunistic" use of the cargo space still available after the green-glazed wares had been taken aboard (Liebner 2014: 302). In the absence of other ownership indicators, the overall arrangement of the ceramic cargos suggests that the ceramics were handled by a single authority.

Another argument to support the assumption that the purchase and handling of the ceramics on the Cirebon wreck was organized under a single authority is the highly uniform character of the ceramics. 46% of the various types of green-glazed bowls belongs to the < bowl 001 > category (Liebner 2009: 42). Moreover, not only the vast majority of the green-glazed stonewares, but also much of the white wares and earthenwares are comprised of a limited number of general shapes (Liebner 2014: 303). One indeed would expect a cargo assembled by a number of individual merchants to exhibit a much greater diversity of shapes and types of ceramics, collected from a much wider range of producers, as can been seen on the Intan ship.

On the other hand, the distribution of the consignments of the "Western" merchandises in the ship's cargo confirms the concept of peddler trade, meaning that a certain type of products was owned by several small merchants each of whom marketed a limited amount of items. There were traders in Middle Eastern glass wares who had packed their batches of beakers and bottles on the vessel's foredeck, and dealers in the fine scents of Persia, whose flasks were stowed somewhere on the starboard deck (Liebner 2014: 168–169). The jewelry found came in at least three different consignments, marked by contrasting proportions of the precious stones retrieved from distinct quarters of the site (Liebner 2014: 183–184). The several hundreds of ingots were placed in the deep center of the hull and are assumed to have been taken aboard after the hold had been filled with the Chinese trade ceramics to the fore and aft (Fig. 3) (Liebner 2014: 201–202).

According to Liebner (2009: 42), the Cirebon ship was heading toward the island of Java, mainly due of the lack of exploitable deposits of metal ores in Java, and also because it is not logical that traders would carry cargoes composed out of Chinese, Indian, and Middle Eastern goods toward the direction of the Straits of Malacca, where these commodities were traded. The reasoning is the same that for the metal ingots on the Intan wreck, and the intended market for the ceramics on the Cirebon ship would have been fairly limited, too, while other products might be sold at several ports of call during the voyage to Java. The fact that the lower hold was filled with Chinese ceramics and Chinese metal wares while non-Chinese cargo was only found in either the vicinity of the 'tween-deck or above the stacks of green-glazed ceramics, indicates that the ship took on all of the Chinese merchandise first at a Chinese port, possibly Guangzhou 广州, and then other products at some Southeast Asian ports. The distribution of cargo suggests that all of the cargo was not loaded together because the pragmatics of judicious loading demands that loading begin at the hold's two extremities, gradually filling sections of cargo space to the fore and aft until the ship's center is reached (Liebner 2014: 297).

Based on the distribution pattern of the recovered objects from the Intan and Cirebon wrecks, it can be concluded that the primary cargos were loaded uniformly in the lower hold of the ship, while other merchandise such as the "Western" products on both wrecks, was either stowed in a few separate compartments, or distributed widely, but the composition of certain compartments showed distinct differences, such as the ceramics on the Intan wreck. It is likely that the voyage of the ships was mainly conducted at the request of one or only a few authorities with abundant assets who could carry out bulk selling, and the remaining space was leased to some individual traders who did retail business.

2 The distribution of cargo on the Nanhai No.1 and the Quanzhou Bay wrecks

The available data indicates that in contrast to the Intan and Cirebon wrecks, the major cargos of the Nanhai No.1 and Quanzhou Bay wrecks, were owned or marketed by various merchants.

The Nanhai No.1 wreck was a mid-thirteenth century Chinese merchant ship destined for Southeast Asia, but which sunk shortly after its renovation at Guangzhou (Fig. 4) (Nanhai No.1 2011). The ship structure of Nanhai No.1 is well preserved, with fourteen crossbeams that divided the Nanhai No.1 wreck into fifteen compartments (Wang and Xiao 2016). The consignments in each compartment varied. According to the 2016 excavation report of the Nanhai No.1 wreck, the bulk of the cargos was Chinese ceramics and iron wares, such as pots and nails (Wang and Xiao 2016). The ceramics were placed inside the cabin while the iron wares were mainly located on the deck with some on top of the ceramics, which indicates that ceramics were loaded first. Ceramics and iron wares were found along the full length of the ship but were not loaded uniformly. Due to the lack of available data regarding the other findings on the deck and the total weight or volume of the iron wares, it is difficult to conclude whether the placement of the iron wares was a reflection of different ownership or was in order to maximize the usage of space. Therefore, I will mainly address the distribution of the ceramic cargos.

Compared with the ceramic cargos on the Intan and Cirebon wrecks, which as mentioned above are each mainly dominated by one specific type of vessel, the ceramics cargo on the Nanhai No.1 wreck displays a much more diverse composition. According to the excavation reports, so far, the recovered ceramics are mainly assigned to six kiln complexes: Jingdezhen 景德镇, Longquan 龙泉, Dehua 德化, Cizao 磁灶, Minqingyi 闽清义 and Jian kiln 建窑, which nearly covers all of the Chinese ceramics types exported to the Southeast Asian region during the Southern Song dynasty (Nanhai No.1 2011, 2018). Overall speaking, ceramics shape found include bowls, plates, jars, bottles, vases, boxes, cups, and small dishes. The ceramic cargos from each cabin vary in vessel shapes and types, as seen in Table 1. It is worth noting again that variation in the cargo amongst compartments is not necessarily caused by different ownership. There are two other explanations. First, it could be because the cargo was picked up at different ports. For example, hypothetically, if products from kiln sites near Fuzhou, such as Longquan, Jingdezhen, Minqingyi and North Fujian, were loaded at Fuzhou while ceramics made at regions adjacent to Quanzhou, such as Dehua and Cizao, were loaded at Quanzhou, then cargos in (any) certain compartments would differ in provenance and vessel shapes. In such a case, it is reasonable to assume that merchandise from the same production sites would be packed in the same vicinity. However, on the Nanhai No.1 wreck, besides the Jian wares and Minqingyi wares, ceramics from the same kiln complexes tend to be distributed dispersedly (Table 1), which indicates that such an explanation does not fit into the ceramic distribution pattern of the Nanhai No.1 wreck.

The second explanation is that a single authority purchased ceramic cargos from various resellers who handled products originating from different kiln sites, which would lead to variation in provenance, quantity, quality, vessel shape and decoration between certain compartments. The Nanhai No. 1 wreck does

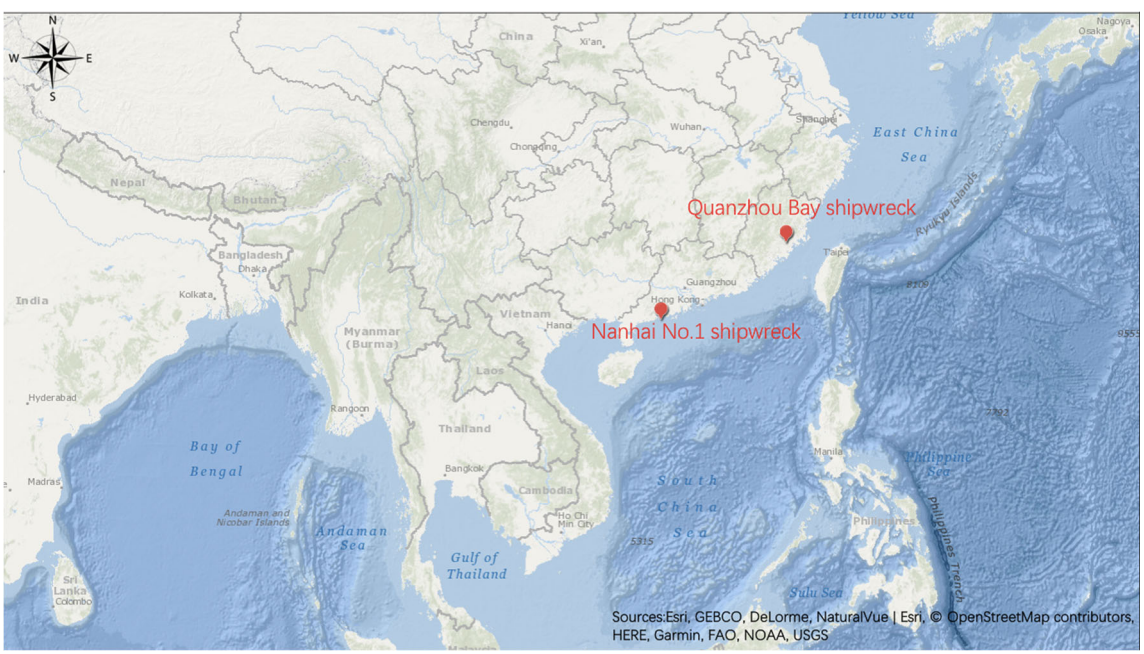

Fig. 4 The locations of the Nanhai No. 1 and Quanzhou Bay shipwrecks

Table 1 The distribution of ceramics on the Nanhai No.1 wreck

Cabin	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10	No.11	No.12	No.13	No.14	Stern (left)	Stern (right)
Jingdezhen Qingbai ware (bowls)	√	√		√											
Jingdezhen Qingbai ware (plates)					√										
Jingdezhen Qingbai ware (cups)							√								√
Longquan celadon (bowls/plates)	√	√	√	√		√	√		√				√		√
Longquan celadon (dishes)							√								
Longquan celadon (cups)							√								
Dehua white wares (bowls/plates)	√	√	√	√	√	√	√			√	√		√	√	
Dehua white wares (vases with flared rim)	√	√					√								
Dehua white wares (boxes)	√	√		√	√				√						
Dehua white wares (double gourd vases)		√													
Dehua white wares (bottles)				√			√		√						
Dehua white wares (jars with two handles)					√		√								
Dehua white wares (jars with four handles)							√						√		
Cizao brown wares (jars)	√	√					√	√							
Cizao brown wares (meiping vases)	√	√	√	√			√								
Cizao green wares (dishes)							√								
Cizao green wares (vases)									√						
Minqingyi green wares (bowls)			√					√	√	√	√	√			
Jian black wares (cups)						√									

source: Wang and Xiao 2016

include some variation in vessel decoration between cabins. For example, a lobed rim is a decoration seen on all of the Qingbai bowls from the Nanhai No. 1 wreck, but ones with concentric rings of petals and incised with the "children at play figure" are exclusively found in cabin 5. The same goes for the green-glazed bowls of the Longquan kiln complex: while incised plants and flowers are the most commonly seen design, small bowls with raised lines on the exterior were only found in cabin 8. Under this assumption of single ownership of the cargo, when loading the ship, the major consideration would have been to maximize the use of cabin space, to reduce the cargo breakage rate, and balancing the ship for safe sailing, in which case the densely-packed bowls and dishes would be placed together at the bottom hold as ballast and then topped by other vessels just as what has been observed on the Cirebon wreck. However, on the Nanhai No.1 wreck, the arrangement does not follow this pattern: some compartments were only found to contain bowls (as in cabins 11, 12, 13) while others also comprised vessels of various forms, such as cabin 8, which included small dishes, big and small jars, bottles, and vases along with the bowls (Fig. 5). Therefore, the most plausible theory to explain the cargo variation between (any) certain compartment on the Nanhai No.1 wreck is that the ceramics were owned by multiple traders who marketed different types of products. And the difference in ceramic types and vessel shapes among cabins, and the appearance of some unique decoration in a specific compartment are likely due to the choices of individual merchants.

Further analysis on the placement of the ceramic cargos on the Nanhai No.1 suggests the possible existence of two merchant groups who marketed products of different quality. The fine Jingdezhen wares were mainly discovered in the fore cabins (cabin 2 to 8). One stern cabin also had find

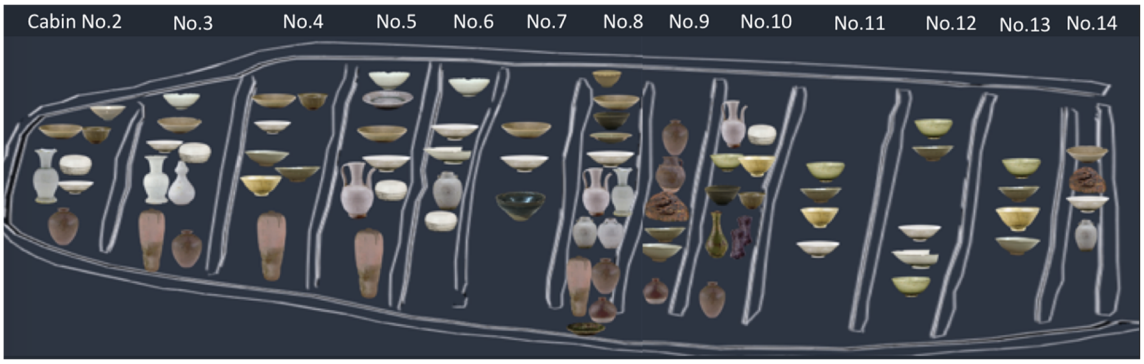

Fig. 5 The distribution of ceramic cargo in each cabin of the Nanhai No.1 wreck, modelled after the 2014 excavation report (Wang and Xiao 2016)

Fig. 6 Dehua white wares with the "Linshang" ink mark from the Nanhai No. 1 wreck (after Nanhai No. 1 2011: 56, 61, 62, 72)

Jingdezhen wares, but this might have been the living chamber, and the ceramics stacked there could have been used for display or daily utensils for the rich on board. In support of this, some golden ornaments were also discovered in the stern cabin, which probably were the personal belongings of the rich merchants, as well as some delicate lacquered boxes and plates (Wang and Xiao 2016). These findings all suggest that people of wealth were on board, and it is reasonable to assume that they could and would choose the ceramics of higher quality for their daily use. The aft hold (cabins 9 to 14), on the other hand, was mainly composed by wares from Fujian kilns. Moreover, in terms of the vessel's types and decorations, the ceramic cargos of the fore compartments are more diverse than those of the aft regions (Table 1). If more investment in craftsmanship results in higher value and hence higher price, then ceramics of the bow and stern cabins were supposed to cater to consumers of different purchasing power. The former were sold to the rich, while the latter were intended for the common folks. Why there was such separate arrangement is unclear. But it is reasonable to assume that if the combined value of the ceramic cargos in the fore cabins is higher than that of the aft cabins, then merchants who owned the cargos of higher value tended to be richer and of higher status. Hence, there were two different merchant groups on board and the hold was assigned accordingly.

Another interesting finding regarding the placement of the ceramics cargo is that in every cabin, Qingbai bowls from the Jingdezhen kiln complex are not found together with Qingbai bowls of Minqingyi kiln complex (Table 1). The Minqingyi kiln products, though named green-glazed wares in the 2014 excavation report, in my opinion, more resemble the glaze colour of Qingbai wares.[4] In terms of the purity of the clay, the gloss of glaze, the smoothness of the surface, and the finish touch of the edge, Jingdezhen Qingbai wares exceed Minqingyi wares. The distinct placement of these two types indicates that in maritime ceramic trade during the Southern Song Dynasty, even the peddlers had specialized in products of different types and quality and aimed for different markets.

The analysis of the ink marks found on some vessels further supports the assumption drawn from the cargo distribution that the ceramics on the Nanhai No.1 wreck were owned by multiple merchants. Several studies show that ink marks served the purpose of labelling ownership rather than as advertising or for anti-forgery.[5] Multiple vessels on the Nanhai No.1 wreck bear ink marks on their bases, and the majority of the marks are names of merchants, among which "Lin Shang 林上" is commonly seen (Nanhai No.1 2011: 71–73). "Lin" should be the surname and "Shang" could be an indication of the position of the cargo in the cabin or the given name of the merchant. The wares with the "Lin Shang" mark on their base were all surfaced from one location, which is said to be the front left compartment (Chen 2013). Moreover, despite of the fact that green wares and brown wares were also found at the same location, the mark only appeared on ceramics of Dehua kilns, including big plates, bowls, and small boxes (Fig. 6). It indicates that Lin was a merchant specially dealing with Dehua white wares, and his cargo was all placed together. These findings further support my conclusion that the ceramics on the Nanhai No.1 wreck were owned by multiple mer-

[4] The major products of the Minqingyi kiln during the period of Southern Song Dynasty, according to the kiln site excavation report, are Qingbai wares with only a few green glazed and brown wares were recovered (Yang 2016). Other works on the ceramics cargo of Nanhai No.1 wreck all refer the Minqingyi kiln wares as Qingbai instead of green glazed (Nanhai No.1 2018). More importantly, during my own visit to the wreck museum, I also could confirm the fact that compared with the Longquan celadon, the glaze color of the Minqingyi kiln wares is more similar to the Jingdezhen Qingbai wares.

[5] The domestic findings of ceramics in China with ink marks are mainly from town sites and temples rather than kiln sites (Zhang 2016), which indicates that inks marks mainly appear on consumed objects instead of newly produced products. The characters in the marks mostly refer to names and titles, while others indicate location or blessing words. It appears that writing ink marks on the purchased items was a common behavior among consumers. The discovery on the Tanjung Simpang shipwreck further supports this assumption. On the Tanjung Simpang wreck, same marks are found on ceramics as well as on one stack of gongs (https://maritimeasia.ws/tsimpang/marks.html, accessed on 17/03/2020). It suggests that the set of marks identifies not the potter but rather the owner or merchant, who would need to identify his own goods at the ship's destination.

Fig. 7 The Quanzhou Bay wreck when first recovered (after Quanzhou 1975: plate 6)

chants, and some of these merchants might have specialized in one specific types of products.

The Quanzhou Bay wreck, unlike the wrecks above which sank during their way to the next ports and were found with all their cargos on board on the seabed, was unearthed in the cultural layer of the Houzhu 后渚 port site in Quanzhou (Fig. 4) and the majority of the cargo was absent (Quanzhou 1975). According to the reconstruction of the ship conducted by Green and Burningham (1998), the bottom was relatively intact while the upper hull was deliberately removed (Fig. 7). It seems that after making it back to Quanzhou, the ship was caught into some accident. The consideration of historical records and the discoveries of valuable spice and timber on the shipwreck leads Chen and Wu (1978) to posit that the ship was destroyed during warfare at Quanzhou in 1277. They argue that before the siege of Quanzhou, the majority of cargo on board had already been sold, and when war broke out, since the ship was still berthed at the port, the ship was destroyed and the remaining cargo lost. Hence, even though most of the cargos had been off-boarded, some were still left behind when the ship was destroyed, to be recovered on the wreck. The intact bottom of the Quanzhou wreck reveals that there were originally twelve crossbeams and thirteen compartments.

From the shipwreck, 2350 kg of wood incense (not dehydrated, originating from the Malay region including gharuwood, sandalwood, and lakawood), spice (mainly pepper), 504 coins, and dozens of ceramics were recovered (Quanzhou 1975). But the most interesting finds are ninety-five pieces of the wooden tags which were discovered in every cabin except cabins 4, 8, and 10, as seen in Table 2. The wooden tags were found among the remains of the cargo, some with strings still attached to them (Fig. 8). It is obvious that they were once fastened to the cargos and used to label the ownerships. Among the identified characters on the wooden tags, Nanjia 南家 is the one that the most common, and seen seventeen times, mainly in cabin 6. Fu (1989) interprets the characters as referring to Nanwai zong zheng si 南外宗正司 (the Southern Exterior Imperial Branch Household).[6] The rest of the names can be divided into three groups: job titles, individual merchants or shops, and imperial clans. There are three types of job titles found, senior officers, crew members and servants working for the big house (Fu 1989). It is of note that the wooden tags with the same characters tended to be closely distributed and mainly in cabins 5 and 6. For example, among the seventeen wooden tags with Nan jia ji hao 南家记号, sixteen were located in compartment 6 and one in compartment 5. Of the eleven wooden tags with Ceng gan Shui ji 曾幹水记, six were found in compartment 5, four in compartment 6, and one in compartment 3 (Table 2). But the majority of the names on the wooden tags appear only one time each, such as the names of crew members and individual merchants or shops, and they usually located quite separately (Table 2). Crew members' names might appear in what could have been spare space in the compartments given for use by the crew as payment for working on the ship. The distribution of the tags for the individual merchants or shops may have been because they did not have sufficient money to organize their own seagoing journey, or for the sake of risk assessment, they rented some space in other people's ships to conduct their business.

The wooden tags suggest that, just as the ceramics were on the Nanhai No.1 wreck, the main cargo on the Quanzhou Bay

[6] Besides Fu (1989), other interpretations of the tags come from Chen and Wu (1978), Zhuang and Zhuang (1980). The biggest difference between their opinions concerns the name "Nanjia". Chen and Wu believes that Nanjia was a discriminatory word used by the Northerners to refer to the Southerners during the Jin and Yuan dynasties (Chen and Wu 1978). However, I find this interpretation not convincing. Because the ship was damaged due to the counterattack of the Song army against the Yuan army in 1277, by which time even though the ruling of the Song court was bound to end, the discrimination policy against the Southerners conducted by the Yuan dynasty would not be widely implemented and accepted yet. Zhuang and Zhuang (1980) argue that Nanjia was the abbreviation for the merchants or shops that sold Southeast Asian products (Zhuang and Zhuang 1980). Considering that almost all the merchandise recovered from the shipwreck originated from Southeast Asia, this interpretation does not make much sense either. By comparison, Fu's argument that Nanjia refered to Nanwai zong zheng si is more logical. Moreover, under this interpretation, other names, such as *Zhuku guoji* 朱库国记, *Chousi* 稠司, *Anjun* 安郡ect., all have a reasonable explanation as well.

Fig. 8 Wooden tags from the Quanzhou Bay wreck (photo courtesy of the Quanzhou Maritime Musuem Fujian)

wreck—the incense wood–was owned by a number of different merchants, some of whom organized relatively larger volumes of trade while the majority being peddlers. This assumption is drawn from the fact that the wooden tags for each name varied in number. The close distribution of the wooden tags with the same characters indicates that the cargos owned by a single merchant or shop were probably loaded at a single port, some would have imported large amounts of products from one place. One indeed could propose the existence of well-established relationships between some production sites and their "bulk clients," which allowed for regular supply, transport and initial marketing of substantial amounts of products.

Table 2 The distribution of wooden tags on the Quanzhou Bay Wreck

Cabin Names on the wooden tags	No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10	No.11	No.12	No.13
Chang Jun 昶郡			1			4							
He Jun 河郡	1												
Zhao Jun 兆郡	1												
An Jun 安郡	1												
? Jun ?郡						1							
Dahe Jun? 大和郡?													1
Xihe Jianggua 西河酱瓜	1												
Cenggan Shuiji 曾幹水记			1		6	4							
Lingan Shuiji 林幹水记			1		2	2							
Zhanggan Shuiji 张幹水记										1			
Gan Ji 幹记										1			
Wuxing Shuiji 吴兴水记						1							
Wuxing 吴兴					1	3							
Qiuding Shuiji 丘碇水记					1								
?? Shuiji ??水记						3							1
Zhuku Guoji 朱库国记													1
Chengong Xiaoji 陈工小记										1			
Li ?Xiangji 礼?香记			1										
Nanjia Jihao 南家记号													1
Nanjia 南家					1	16							
Goujian Jihao ?? 狗间记号??												1	
Jihao 记号										1			
Ceng Gan 曾干					1	2							
Zhang Gan 张干										1			
Ya Li 哑哩										1			
Xiao Cheng 小陈	1												
Zhang Shi 张什										1			
Zhang Ban 张绊										1			
Wang Mei 王美										1			
Yang Gong 杨工												1	
You Gong 尤工												1	
Sanjiu Gong 三九工													1
Liu Shi 六十													1
Shan Zhong 山中	1												
Anchu Ji 安厨记							1						
Chou Si 稠司(Probably)									1				
Unidentified character						6				2		2	
No words	1	3				1			1			2	

source: Quanzhou 1975

3 Conclusion

Between the tenth to thirteenth centuries, the mode of maritime commerce and trade in the South China Sea changes. In the tenth century, as represented by the Intan and Cirebon shipwrecks, the trade of major cargo was organized by a few or a single authority, possibly the state government, with ships heading toward limited destinations. During the later period, as the case studies of the Nanhai No.1 and Quanzhou Bay wrecks show, the sea-borne journey was mainly a profit-oriented adventure participated in by individual merchants whose identities were not limited to traders with an official background or abundant assets—they could include those of lower social status such as sailors, small merchants, or plain citizens who wished to earn additional income by investing in this risky business. The shipwrecks carrying cargos of various types and different quality and handled by multiple owners were more likely to have had planned voyages with calls at a number of ports, rather than just heading toward an entrepôt. It was a peddler trade, and some of the peddlers would have specialized in a specific type of product. The development of sea-borne trade and the change in identities of the maritime merchants involved in it also influenced the traded ceramic industry, which experienced a shift in the center of production from Zhejiang to Guangzhou and then to Fujian during the Song period.

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