CHAPTER 12

Ship Operation in Transition: Greek Cargo Sailing Ships and Steamers, 1860s–1910s

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1 Introduction

The transition from sail to steam navigation was among the most important revolutionary phenomena of industrialization during the nineteenth century. It had a transformative impact on traditional sectors of maritime industries such as shipping, shipbuilding, and in related port trades. The speed and regularity of the steamship introduced new forms of shipping sectors such as the passenger liner and cargo liner, the precursor of container shipping. In the older sector, tramp shipping, the introduction of the steamship created economies of scale in tonnage capacity and in turnaround times of a voyage. The industrialization of ships, shipbuilding, and ports also necessitated new knowledge from new types of arts and professions working on new materials and processing methods, including engineers, firemen, stokers, boiler makers, and so on. In this transforming environment, shipping enterprises had to adapt to new demands in terms of capital, expertise, management, and skilled labour. Among the many aspects of the shipping firm that have been studied, ship operation constitutes a distinct and fundamental aspect of management that remains unexplored for this period of transition from sail to steam. This paper, therefore, aims at contributing to the study of the evolution of the shipping firm by analysing the ship operation of Greek cargo sailing ships and steamers in the transformative period between the 1860s to 1910s.

The transition to steam navigation was not a uniform process in time and level of development across the world. Great Britain, where the industrial revolution took place, was the most advanced in developments in shipping, shipbuilding, and marine engineering. The United States, France, Germany, and Spain and other western European countries followed far behind.[1] In Greece sail dominated for most of the nineteenth century. Greeks, as Ottoman, Venetian, or British subjects specialized in the transport of cereals already

1 A.N. Kiaer, *Statistiques Internationale. Navigation Maritime,* vol. 2: *Les Marines Marchandes* (Christiania: Bureau Central de Statistique du Royaume de Norvege, 1881), 44, Appendice X.

in the late eighteenth century from the eastern Mediterranean.[2] During the period of the 1830s–1880s, that coincides with the apogee of the Black Sea grain trade, Greek-owned tramp shipping was engaged in it with a fleet of sailing ships, mostly from islands of the Ionian and the Aegean seas. These shipowners collaborated in the transport of cereals with Greek diaspora merchants based in the Black Sea, western Mediterranean, and north-western European ports, who controlled large shares of the traffic of Russian grain trade. Many of these merchants also came from the same Aegean and Ionian islands as the shipowners, thus creating a strong network based on common origin and kinship.[3] This specialization in the grain trade, and more generally in tramp shipping, remained a constant element of Greek-owned shipping throughout the periods of sail and steam as well as up to the present day. The introduction of passenger shipping from the *Hellenic Steam Navigation Company* in 1856 did not bring structural changes in Greek cargo shipping.[4] Greek shipowners began to invest in cargo steamers only from the 1880s, and more systematically from the 1890s. However, already by 1902, the tonnage of steamships in Greece, most of them cargo vessels, surpassed that of the sailing ships.[5] This transition to cargo steamers is divided into two main periods. The first was up to the middle of the 1890s, when wealthy diaspora capitalists from Istanbul, the Black Sea, and western European ports invested in newly built steamers in collaboration with shipowners from traditional maritime communities, such as Syros, Andros, Cephalonia, Ithaki, and Chios, that successfully shifted to the new technology of steam.[6] The second period up to the First World War

2 Gelina Harlaftis, "The 'eastern invasion'. Greeks in Mediterranean trade and shipping in the eighteenth and early nineteenth centuries," in *Trade and Cultural Exchange in the Early Modern Mediterranean: Braudel's Maritime Legacy*, eds. Maria Fusaro, Colin Heywood, Mohamed-Salah Omri (London: I.B. Tauris 2010), 223–52.

3 Gelina Harlaftis, *Creating Global Shipping. Aristotle Onasis, the Vagliano Brothers, and the Business of Shipping, c.1820–1970* (Cambridge: Cambridge University Press, 2019), 35–38; Gelina Harlaftis and Jesús M. Valdaliso, "Business groups and entrepreneurial families in southern Europe: comparing Greek and Spanish shipowners in the nineteenth and twentieth centuries," in *The World's Key Industry History and Economics of International Shipping* eds. Gelina Harlaftis, Stig Tenold, and Jesús M. Valdaliso (Basingstoke: Palgrave Macmillan, 2012), 247–48.

4 Apostolos Delis, "From parallel growth to great divergence: Greek shipbuilding from the late eighteenth to early twentieth centuries," *History of Technology*, no. 33 (2017) (Special Issue: History of Technology in Greece from the Nineteenth to the Twenty-first Century, eds. Stathis Arapostathis and Aristotle Tympas): 37–38.

5 Gelina Harlaftis, *A History of Greek-Owned Shipping. The Making of an International Tramp Fleet, 1830 to the Present Day* (London: Routledge, 1996), 112, 133; Vasilis Kardasis, Από του ιστίου εις τον ατμόν. Ελληνική Εμπορική Ναυτιλία (*1858–1914*) [*From Sail to Steam. The Greek Merchant Marine* (*1858–1914*)] (Athens: ETBA, 1993), 172.

6 Harlaftis, *A History of Greek-Owned Shipping*, Figure 1.1, 3.

was characterized by the transference of shipping headquarters to Piraeus and London and the entrance of many small or single ship owners. In this phase, Greek shipowners bought second-hand British-built steamers due to the low freight rates of the first decade of the twentieth century that also dropped ship prices.[7] British shipowners, who had before the fall of freight rates invested in new and large cargo steamers, faced competition from these old and smaller steamers sold to foreigners in a depressed freight period.[8]

The literature on Greek-owned tramp shipping has focused on many aspects, including the mapping of the Greek shipowners, their places of origin, the areas of operation, their business strategies and networks, their position in the international markets, as well as their relationship with the Greek State.[9] The transition from sail to steam in Greek-owned tramp shipping in the last third of the nineteenth century has also been analysed in terms of business strategies and methods of investment in the new technology.[10] Despite the fact that the organization, structure, and networking of Greek-owned shipping firms have been the subject of analysis by Greek historians, crucial issues,

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7 Gelina Harlaftis, "Pattern of ownership and finance in the Greek deep-sea steamship fleet, 1880–1914," in *Management, Finance and Industrial Relations in Maritime Industries: Essays in International Maritime Business History*. eds. Simon P. Ville and David M. Williams (Research in Maritime History 6) (St. John's, Newfoundland: International Maritime Economic History Association, 1994), 143–45.

8 Robin S. Craig, "Aspects of tramp shipping and ownership," in *Ships and Shipbuilding in the North Atlantic Region*, eds. Keith Matthews and Gerald Panting (St. John's: Memorial University of Newfoundland, 1978), 223.

9 There is an extensive bibliography on these aspects, especially by Gelina Harlaftis, from which we cite a representative selection of works, among them: Harlaftis, *A History of Greek-Owned Shipping; Greek Shipowners and Greece, 1945–1975. From Separate Development to Mutual Interdependence* (London: Athlone Press 1993); idem, *Creating Global Shipping*; Gelina Harlaftis and Katerina Papakonstantinou (eds.), Η ναυτιλία των Ελλήνων, *1700–1821*. Ο αιώνας της ακμής πριν από την Επανάσταση [*Greek Shipping, 1700–1821. The Heyday Before the Greek Revolution*] (Athens: Kedros Publications, 2013); Gelina Harlaftis and Nikos Vlassopoulos, *Pontoporeia, Historical Registry Book of Greek Cargo Sailing Ships and Steamships, 1830–1939* (Athens: ELIA/Niarchos Foundation, 2002); Gelina Harlaftis, Helen Beneki, and Manos Haritatos, *Ploto. Greek Shipowners from the Late 18th Century to the Eve of World War II* (Athens: ELIA/Niarchos Foundation, 2003); Ioannis Theotokas and Gelina Harlaftis, *Leadership in World Shipping: Greek Family Firms in International Business* (Basingstoke: Palgrave/Macmillan, 2009). See also Alexandra Papadopoulou, Ναυτιλιακές Επιχειρήσεις, Διεθνή Δίκτυα και Θεσμοί στην Σπετσιώτικη Εμπορική Ναυτιλία, *1830–1870*. Οργάνωση, διοίκηση και στρατηγική [*Maritime Businesses, Networks and Institutions in Merchant Shipping of the Island of Spetses, 1830–1870. Organization, Governance and Strategy*] (PhD diss., Ionian University, 2010).

10 Harlaftis, *A History of Greek-Owned Shipping*, chapter 4; and Kardasis, Από του ιστίου εις τον ατμόν, 145–181.

such as the operation of the ship, that constitutes the flesh and bones of shipping activity, have not been studied yet. Ship operation in the tramp sector, a neglected subject also internationally, is instrumental for understanding the function and performance of the shipping business.[11] It illuminates key aspects, such as the organization of the firm, the deployment, and management of resources (capital, ships, labour) and the strategies in the shipping markets (the freight and shipbuilding market, suppliers, and the ship services market). The study of ship operation by Greek shipping firms will focus on specific case studies that span from the 1860s to the First World War, namely during the transition from sail to steam.

The period of sail is represented through the case of Ioannis and Stamatios Kaloyannis, father and son from Hydra in the western Aegean, who owned a small fleet of sailing ships from the 1840s to the 1880s. Hydra, from the late eighteenth and throughout to the nineteenth century, was one of the most developed maritime communities in the sailing ship economy, which did not make the transition to steam.[12] The evidence in this case is based on material regarding the Kaloyannis' ships: the schooner *Tripolina* from 1861 to 1864, and the brig *Eleni Koupa* from 1878 to 1887.[13] The period of cargo steamers is studied through the case of shipping firms from the island of Andros in the central Aegean, one of the traditional maritime communities that successfully made the transition to steam.[14] The Andros cases include the steamer *Georgios*

11 Among the few works on ship operation to my knowledge are two of Gordon Boyce, "Edward Bates and Sons, 1897–1915: recession and recovery," *International Journal of Maritime History*, 23 no. 1 (June 2011): 13–50; and idem, *The Growth and Dissolution of a Large-Scale Business Enterprise: the Furness Interest, 1892–1919* (Research in Maritime History 49) (St. John's Newfoundland: International Maritime Economic History Association, 2012).

12 Gelina Harlaftis, "Η 'ναυτική πολιτεία' του Ιονίου και του Αιγαίου. Ναυτότοποι, ναυτικές οικογένειες και επιχειρήσεις" ["The 'maritime city' of the Ionian and the Aegean. Maritime communities, families and enterprises"] in Harlaftis and Papakonstantinou, Η ναυτιλία των Ελλήνων, 353–405; in the same volume: Gelina Harlaftis, "Η 'ναυτική πολιτεία' του Ιονίου και του Αιγαίου. Στόλος και ανταγωνιστικότητα" ["The 'maritime city' of the Ionian and the Aegean. Fleets and competitiveness"], 407–43, and: Alexandra Papadopoulou, "Από το τοπικό στο παγκόσμιο: η ενσωμάτωση των ναυτότοπων του Αιγαίου στο μεσογειακό εμπορικό σύστημα τέλη 18ου–αρχές 19ου αιώνα" ["From local to global: the integration of the Aegean maritime communities in the Mediterranean commercial system, late 18th–early 19th century"], 703–34.

13 Private archive of Evangelos Rafalias, Hydra. I am very much indebted to Minas Antypas (PhD student, University of Crete), a specialist on Hydra's maritime past, for finding, collecting, and sending me this invaluable material.

14 Harlaftis, *A History of Greek-Owned Shipping*, Figure 1.1, 3. The evidence comes mainly from the maritime archives of Kaireios Library in Andros, and to a lesser extent from the Hellenic Literary and Historical Archive (ELIA) in Athens. I would like to thank for their work in the research missions in Andros: Popi Vasilaki, Petros Kastrinakis, Alkiviadis

M. Embiricos (1904–16), owned by Stamatios G. Embiricos, one of the largest and long-lasting Greek shipping companies, founded in 1896, which along with ship owning, provided all kinds of shipping services and management for ships, with offices in Athens and Cardiff.[15] This case is mainly compared with the steamer *Leonardos G. Goulandris* (1902–15) owned by the Goulandris Brothers, also from Andros, a single ship firm that lasted up to 1939, and to a smaller extent with the *s/s Andriana* (1906–10) owned by Alkiviadis Embiricos, a member of the most influential branch of the Embiricos business group in politics and shipping.[16]

The evidence derived from account books and papers, which constitute the common types of records in the archives of both sailing and steam shipping firms, offers the opportunity to study the changes and evolution in the operation of Greek-owned tramp shipping during the transition from sail to steam. The first part of this chapter treats the forms of ownership and the fleet of the firms, including the types and technology of the ships as well as the choices of the shipowners in the shipbuilding market. The second part analyses two hitherto unexplored aspects of ship operation management of the firms. One external: the "ship operation services", namely the suppliers and other professionals that provided all kinds of materials and services in the ports needed during the voyage; and the other internal: the accounting system. These aspects were of paramount importance in ship operation and reflect the level of expansion, market integration, organizational efficiency, and the overall performance of the firm. In the third part of the chapter, the analysis focuses on the operation and the performance of the ships by examining trade routes and cargoes, the turnover of voyages, the operation costs, and profitability. The final part, explores the labour force through an analysis of crew

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Kapokakis, and Thomas Kalesios, all PhD students of the University of Crete and members of SeaLiT.

15 Theotokas and Harlaftis, *Leadership in World Shipping*, 147–48.

16 Leonidas E. Bistis, Ο Ατμήρης εμπορικός στόλος της Άνδρου. Από της συστάσεώς του μέχρι της λήξεως του Β' Παγκοσμίου Πολέμου (*1882–1945*) [*The Steamship Fleet of Andros. From its Beginning to WWII* (*1882–1945*)] (Athens: Union of Andriots, 1982), 45–46, 59, 98, 102; Gelina Harlaftis and Jesús M. Valdaliso, "Business groups and entrepreneurial families in southern Europe: comparing Greek and Spanish shipowners in the nineteenth and twentieth centuries," in *The World's Key Industry. History and Economics of International Shipping* eds. Gelina Harlaftis, Stig Tenold, and Jesús M. Valdaliso (Basingstoke: Palgrave Macmillan, 2012), 243–44; http://www.teesbuiltships.co.uk/view.php?year_built=1896&builder=5027&ref=168757&vessel=CHISWICK, http://www.sunderlandships.com/view.php?official_number=&imo=&builder=&builder_eng=&year_built=&launch_after=&launch_before=&role=&type_ref1=&propulsion=&owner=&port=&flag=&disposal=&lost=&ref=103588&vessel=ANDRIANA (accessed 24 June 2020).

size, specialization, wages, and professional mobility. Labour questions are also examined in combination with the economic performance of the ships (freight rates, profitability).

2 Fleet and Ownership

2.1 *Ships, Maritime Technology and Shipbuilding Markets*

In the Mediterranean, during the period of activity of the Kaloyannis firm, tramp shipping was operated mainly by sailing ships. The fleet of Kaloyannis (Table 12.1) was composed mostly of brigs. The brig was the backbone of the sailing merchant fleet of Greek shipowners in the nineteenth century, and the most widespread type of commercial sailing vessel in the Mediterranean and in northern Europe.[17] Kaloyanni's ships were either built new in Syros, the largest shipbuilding centre in Greece, or bought second-hand in foreign shipyards. During the period 1830–80, Greek shipowners built most of their fleet in Greek shipyards. The shipyards in Syros not only built most of the tonnage in Greece during this period, but also in the middle of the nineteenth century were competitive at a Mediterranean level with entire areas, like Liguria and Provence.[18] According to Chart 12.1, there was a close interdependence between the two industries—shipping and shipbuilding—and Syros's output was very much influenced by the course of freight rates and the economic performance of Greek-owned shipping. In fact, peaks (1839, 1847, 1853, 1857, 1867) and troughs (1837, 1842, 1851, 1861, 1865, 1873) in Syros' shipbuilding output strictly correlate with the path of the freight rates and the shipping income of Greek ship owning firms.

17 Apostolos Delis, *Mediterranean Wooden Shipbuilding. Economy, Technology and Institutions in the Nineteenth Century* (Leiden and Boston: Brill, 2015), 142–45; idem, "Mediterranean wooden shipbuilding in the nineteenth century: production, productivity and ship types in comparative perspective," *Cahiers de la Méditerranée*, no. 84 (2012): 358–63; Laurent Pavlidis, "La construction navale traditionnelle provençale au XIX^{e} siècle. Sources et méthodes," *Cahiers de la Méditerranée*, no. 84 (2012): 345; Luciana Gatti, *"Un raggio di convenienza". Navi mercantili, costruttori proprietari in Liguria nella prima metà dell' Ottocento* (Genoa: Società Ligure di Storia Patria, 2008); David R. MacGregor, "The wooden sailing ship: under 330 tons," in *Sail's Last Century. The Merchant Sailing Ship, 1830–1930, Conway's History of the Ship*, ed. Robert Gardiner (London: Conway Maritime Press, 1993), 48; David R. MacGregor, *Merchant Sailing Ships, 1850–1875, Heyday of Sail*, (AnNapless: Naval Institute Press, 1984), 73–79.

18 Apostolos Delis, "Modern Greece's first industry? The shipbuilding center of sailing merchant marine of Syros, 1830–70," *European Review of Economic History*, 19, no. 3 (August 2015): 263; and idem, "Mediterranean wooden shipbuilding," 353–58.

TABLE 12.1 The Kaloyannis fleet

Ship Name	Ship Type	Tonnage	Place of Construction	Year of Construction	Period of Ownership
Θεοφάνεια (*Theofania*)	brig	216	Syros	1841	1841–55
Τριπολίνα (*Tripolina*)	schooner/ brig (1865)	186	London	1845	1855–65
Καμίτα (*Camita*)	brig	117	Danube	1845	1855
Κουντουριώτης (*Coundouriotis*)/ex *Lucia*	brig	299	Capo d'Istria	1853	1866–81
Παναγία της Ύδρας (*Panaya tis Ydras*)	brig	220	Syros	1867	1867–79
Ελένη Κούπα (*Eleni Koupa*)	brig	276	Syros	1878	1878–87

SOURCE: PROCESSED DATA FROM GELINA HARLAFTIS AND NIKOS VLASSOPOULOS, *PONTOPOREIA, HISTORICAL REGISTRY BOOK OF GREEK CARGO SAILING SHIPS AND STEAMSHIPS, 1830–1939* (ATHENS: ELIA/NIARCHOS FOUNDATION, 2002); PRIVATE ARCHIVE OF EVANGELOS RAFALIAS, HYDRA, ACCOUNT BOOK AND LOGBOOK OF *ELENI KOUPA* AND LOGBOOKS OF *COUNDOURIOTIS* AND *PANAYA TIS YDRAS*; *ANNUARIO MARITIMO PER L'ANNO 1854*, VOL. 4, (TRIESTE: LLOYD AUSTRIACO, 1854), 174; AND *1867*, VOL. 17, 82

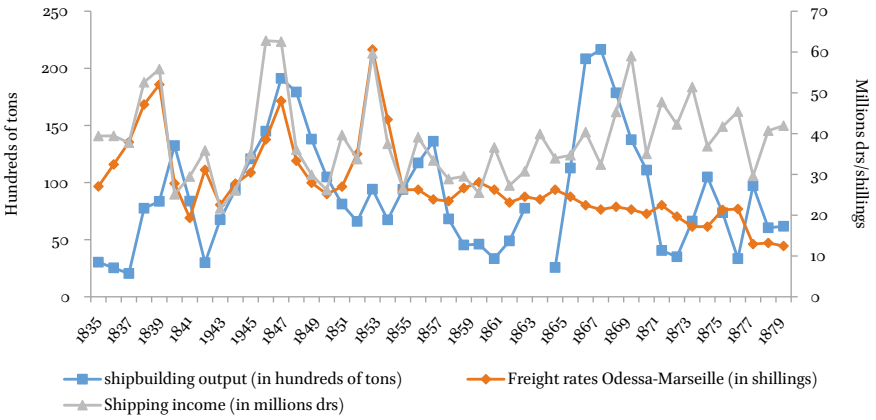

CHART 12.1 Syros shipbuilding output/shipping income (in drachmas)/freight rates Odessa-Marseilles

SOURCE: APOSTOLOS DELIS, *MEDITERRANEAN WOODEN SHIPBUILDING. ECONOMY, TECHNOLOGY AND INSTITUTIONS IN THE NINETEENTH CENTURY* (LEIDEN AND BOSTON: BRILL, 2015), 63

During the same period, the steamship was under continuous technical evolution. Up to the 1840s, it was a paddle-driven wooden vessel of limited tonnage capacity, employed in river and coastal routes, specialized in the transport of mail, people, and light cargo. Gradually from the late 1830s in Britain, steamers began to expand to longer and oceanic routes, but always carrying passengers, mail, and some cargo. From the 1850s up to the 1880s, technical developments in the engines and boiler, in the propulsion system from paddle to screw, and in the hull material from wood to iron, industrialized the steamship, which enabled her to capture the market in tramp shipping.[19] It was after the 1880s, when the steamship was in the most advanced stage of its technical development, that Greek shipowners began to shift from sailing ships to cargo steamers.

The building of the fleet of S.G. Embiricos is a typical example of this process. Georgios Michail Embiricos (1837–1902), father of Stamatios, was already an owner of sailing ships. He was also one of the first Greek shipowners who built an iron cargo steamer, the *Constantinos*, in the UK in 1884.[20] Before his death in 1902, he bought two more second-hand steel cargo steamers: the *Michail* and *Asimina*.[21] His son Stamatios Embiricos (1868–1934) established his own firm, S.G. Embiricos, in Cardiff in 1896, and was the major shareholder in his father's firm and carried the management of the fleet. In the years up to the First World War, Stamatios expanded the fleet only with newly-built steel screw steamers, among which there was the *Georgios M. Embiricos*, the first of a series of five built between 1904 and 1914. All vessels were ordered at Short Broers Ltd. of Sunderland, a medium-sized, but very long-lasting shipbuilding

19 The literature and sources on this subject are very extensive. We can cite some representative works such as: Robert Gardiner (ed.), *The Advent of Steam. The Merchant Steamship before 1900. Conway's History of the Ship* (London: Conway Maritime Press, 1993); John Armstrong and David M. Williams, *The Impact of Technological Change. The Early Steamship in Britain* (Research in Maritime History 47) (St. John's, Newfoundland: International Maritime Economic History Association, 2011); Anthony Slaven, "The shipbuilding industry," in *The Dynamics of Victorian Business*, ed. Roy Church (London: Routledge, 1980), 110–11; Anthony Slaven, "Modern british shipbuilding, 1800–1990," in *The Shipbuilding Industry: a Guide to Historical Records*, ed. L.A. Ritchie (Manchester: Manchester University Press, 1992), 2–3; Anthony Slaven, *British Shipbuilding: a History, 1500–2010* (Lancaster: Crucible Books, 2013); Crosbie Smith, *Coal, Steam and Ships. Engineering, Enterprise and Empire on the Nineteenth-Century Seas* (Cambridge: Cambridge University Press, 2018).

20 According to Bistis, Ο Ατμήρης εμπορικός στόλος, 90, *Constantinos* was owned by K.L. Embiricos based in Braila, and Georgios M. Embiricos was her captain and co-owner.

21 http://www.steniotes.gr/plegma/4/1/6005.html (accessed 31 March 2020).

yard (1850–1964), and was engined by J. Dickinson & Sons, a close collaborator of them (Table 12.2).[22]

TABLE 12.2 The *S.G. Embiricos* fleet up to the First World War[a]

Ship Name	Tonnage	Shipbuilder, Place of Construction/Engine Builder	Year of Construction	Engine details	Period of ownership
Constantinos	1727 grt/ 1109 nrt	McIntyre & Co, Hebburn/Blair & Co Ltd, Stockton-on-Tees	1884	C2cyl (32 & 60 × 39in), 188hp	1884–1900
Fulweel/ ***Michail***	2514 grt/ 1595 nrt	J.L. Thompson & Sons Ltd., North Sands/J. Dickinson, Monkwearmouth, Sunderland	1890	T3cyl (22, 36, 59 × 39in), 222nhp	1899–1916
Beechley/ ***Asimina***	2878 grt/ 1852 nrt	CS Swan & Hunter, Wallsend, Newcastle/ Westgarth, English & Co Ltd, Middlesbrough	1894	T3cyl (23, 37 & 61 × 39in), 250nhp	1899–1918
*Ardova/****Andros***	3139 grt/ 2012 nrt	Blyth Shipbuilding Co. Ltd., Blyth/Blair & Co. Ltd, Stockton-on-Tees	1896	T3cyl (24, 40, 65 × 42in), 281nhp	1901–13
Georgios M. Embiricos	3636 grt/2324 nrt	Short Brothers Ltd., Sunderland/J. Dickinson & Sons Ltd, Monkwearmouth, Sunderland	1904	T3cyl (25, 42, 68 × 45in), 324nhp	1904–16

a The firm purchased another nine steamers after the First World War, from 1920 up to 1938: Bistis, Ο Ατμήρης εμπορικός στόλος, 53; Kaireios Library, Inventory of the Maritime Archives of S.G. Embiricos.

22 L.A. Ritchie (ed.), *The Shipbuilding Industry: a Guide to Historical Records* (Manchester: Manchester University Press, 1992), 140–41; "Short Brothers of Sunderland", *Grace's Guide to British Industrial History*: https://gracesguide.co.uk/Short_Brothers_of_Sunderland (accessed 29 April 2020); and "John Dickinson and Sons", https://gracesguide.co.uk/John_Dickinson_and_Sons (accessed 29 April 2020).

TABLE 12.2 The *S.G. Embiricos* fleet up to the First World War (*cont.*)

Ship Name	Tonnage	Shipbuilder, Place of Construction/Engine Builder	Year of Construction	Engine details	Period of ownership
Eugenie S. Embiricos	4139 grt/ 2670 nrt	idem	1907	T3cyl (25, 42 & 70 × 48in), 364nhp, 1 Screw	1907–17
Ellin	4577 grt/ 2780 nrt	idem	1913	T3cyl (25.5, 42.5 & 72 × 48in), 386nhp	1913–36
Vasileus Konstantinos	4070 grt/ 2489 nrt	idem	1913	T3cyl (25, 42.5 & 69 × 45in), 353nhp	1913–17
Dorothy T. Short	4494 grt/ 2674 nrt	idem	1914	T3cyl (25.5, 43 & 72 × 48in), 386nhp	1915–17

SOURCE: PROCESSED DATA FROM HTTP://SHIPPINGANDSHIPBUILDING.UK/ 10 JULY 2021. IN ENGINE DETAILS COLUMN C STANDS FOR COMPOUND, T FOR TRIPLE EXPANSION ENGINE. THE NUMBERS IN PARENTHESIS STAND FOR THE ATMOSPHERIC PRESSURE OF THE CYLINDER AND THE NUMBER FOLLOWED BY IN, INDICATED THE LENGTH OF THE STROKE OF THE ENGINE. THE NUMBER OUTSIDE THE PARENTHESIS FOLLOWED BY THE NHP STANDS FOR THE NOMINAL HORSEPOWER OF THE ENGINE

The preference towards British shipyards is because Britain throughout the nineteenth and part of the twentieth century, was the biggest producer of steamships worldwide, and areas like the Clyde, the Thames, and north-east England were the most advanced in industrial shipbuilding and marine engineering. British shipyards produced steamships for domestic and foreign shipowners alike, and between 1856 and 1875, 24% of steam tonnage was produced for foreign flags. In the last two decades before the First World War, British shipyards built 60 to 80% of world production, out of which 25 to 30% was for foreign flags.[23] The few Greek shipbuilding establishments, one in Syros and

23 Slaven, "The shipbuilding industry", 124; Simon Ville, "Introduction," in *Shipbuilding in the United Kingdom in the 19th Century: a Regional Approach*, ed. Simon Ville (Research in Maritime History 4) (Saint John, Newfoundland: International Economic History Association, 1993), vii.

TABLE 12.3A Areas of construction of Greek (new and second-hand) steamers over 100 tons registered on 1 January 1912 (number of vessels)

Clyde	Wear	Tyne	Tees	Rest of UK (including eastern Scotland and Ireland)	Mediterranean	Northern Europe
59	58	50	64	23	8	12

SOURCE: PROCESSED DATA FROM *Δελτίον της Ελληνικής Ναυτικής Ενώσεως* [*BULLETIN OF THE HELLENIC SHIPPING UNION*] (ATHENS, 1912), 20–45.

TABLE 12.3B British areas of construction of newly-built Greek steamers over 100 tons up to 1939 (number of vessels)

Clyde	Wear	Tyne	Tees	Rest of UK (including eastern Scotland and Ireland)
32	72	24	46	7

SOURCE: PROCESSED DATA FROM HTTP://SHIPPINGANDSHIPBUILDING.UK/, 10 JULY 2021

two in Piraeus, were unable to compete in technological and economic terms, and they focused instead on small engineering and repair work. Thus, Greek shipowners sought in the British shipbuilding market either new or second-hand steamers, which caused a divergence between the two sectors of the shipping industry. Shipping and shipbuilding in Greece no longer, like in the age of sail, advanced hand-in-hand one depending on the other.[24]

Greek shipowners were oriented towards the shipyards of north-eastern England, which include the areas around the rivers Tyne, Wear, and Tees. Table 12.3a shows that 254 out of the total 274 steamships, purchased either new and second-hand, were built in Britain, and from them the 172 of the total 274 Greek Steamers (63%) were built in the north-eastern yards of Wear, Tyne, and Tees. Greek shipowners (Table 12.3b), including those of the islands of Chios and Oinousses integrated into Greece after the Balkan Wars, built their steamships at north-eastern yards in 142 out of 181 cases, with Wear shipyards receiving the highest number of orders (72 or 40%). This preference of Greek shipowners for north-eastern shipyards is related to the character of

24 Delis, "From parallel growth", 29–40.

both industries. Greek-owned shipping was specialized in tramp shipping and north-eastern shipyards were specialized in the period of steam in the construction of tramp cargo vessels; this was in contrast to Clyde, which was more specialized in liner ships and cargo-liner shipbuilding. This specialization was more profound in Wear and Tees, which perhaps explains why Greek shipowners built most of their steamers in those two areas.[25]

2.2 *Forms of Ownership*

The advent of steam brought changes in the form of ownership of vessels. In Greece after 1830, sailing ship ownership was based on the 24 shares (*carati*) system, which was also in use in the Italian peninsula, and had its origins back in the late medieval/early modern period. Shareholders enjoyed limited liability and the right to sell their shares without the consensus of the rest of shareholders. In a period of limited investment opportunities in Greece, ship shares were a flexible, moderate cost, and often-profitable investment option for investors outside the shipping industry, thus creating the distinction between active and passive shareholders.[26] The shift of Greek shipowners to cargo steamers from the 1880s, and the necessity to create joint shipping ventures to raise the necessary capital, changed the traditional way of ship co-ownership of 24 shares to that of 100 shares.[27] This change was influenced perhaps by the Company Act of 1862 in Britain, that introduced limited liability and led some British tramp shipowners to form limited single ship companies not in the traditional 64ths system, but in smaller denominations.[28] In fact, in the case of Andros cargo steamers in the early twentieth century, archival evidence reveals that the steamship ownership there was divided into 100 shares.[29] However, also in the steamship period it seems that certain fundamental characteristics of ship partnership were preserved from the sailing ship era, such as the flexibility and limited liability of shareholders, as well as the distinction between active and passive shareholders.

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25 Simon Ville, "Shipbuilding in the northeast of England in the nineteenth century," in *Shipbuilding in the United Kingdom*, 10; Slaven, "Modern British shipbuilding", 8.

26 Georgios A. Rallis, Ερμηνεία του Ελληνικού Εμπορικού Δικαίου [*Interpretation of Greek Commercial Law*], vol. Β′ (Athens: 1865), 73–74.

27 Vasilis Kardasis, Από του ιστίου εις τον ατμόν. Ελληνική Εμπορική Ναυτιλία*, 1858–1914* [*From Sail to Steam. The Greek Merchant Marine, 1850–1914*] (Athens, 1993), 158; Dimitra Kardakaris, draft chapter of an ongoing PhD thesis, at the Ionian University.

28 Gordon Boyce, "64thers, syndicates and stock promotions: information flows and fundraising techniques of British ship owners before 1914," *The Journal of Economic History* 52, no. 1 (March 1992): 189.

29 Kaireios Library, Andros, Νηολόγιο Άνδρου, 1878–1947 [Andros Port Registry], vol. B.

Family ties were an integral and diachronic component of the Greek ship owning firm, and rightfully Greek shipping can be characterized as a family business. Stamatios Kaloyannis served as captain on the *Tripolina* and on the *Coundouriotis*, both owned by his father Ioannis and Dimitrios Kaloyannis, while he owned the *Panaya tis Ydras* and the *Eleni Koupa*. Georgios Embiricos, father of Stamatios, in 1873, built the *Moscha* in Syros, a 439-ton barque, in partnership with his father Michail and three members of the extended Embiricos family, one of which was also the captain. Therefore, the partnership in the sailing ship era between family members extended beyond ownership, and into the operation of the vessel, and in key functions, such as that of captain, first or second mate, or back in the office. This was also the case in the early twentieth century with the Goulandris Brothers (Aristidis, Georgios, and Alkiviadis), alternating as captains, first, and second mates of their steamer the *Leonardos G. Goulandris*. All of these shipowners and partners that practised the maritime professions most of their lives, belonged to the seafaring people of their own communities. They were distinguished from the class of merchants who owned ships for carrying their cargoes, like those of the Greek Diaspora, since they were specialized exclusively in shipping.

Stamatios G. Embiricos on the other hand was a new type of ship operator of the steamship era, who, despite the fact that he belonged to this milieu of seafarers, never worked at sea and followed a different path, which also marked the type of management of his firm. After being trained in his uncles' Alciviades and Leonidas shipping firm in Braila, he set up a shipping office in the UK. This was the third Greek shipping management office established in Britain after the Vagliano Brothers and Zorzis Michalinos. The shipping management offices played a pivotal role in the modernization and development of Greek-owned shipping. They managed their own ships as well as those of other Greek shipowners by providing credit, capital, market information, and mediation for the purchase of new or second-hand steamers, the supervision of the construction, and guarantee of the payment, along with all kinds of operational services, such as chartering, insurance, etc. In the first decade of the twentieth century, other similar London offices were opened by previous close collaborators of the Vagliano Brothers, who set up the first Greek shipping management office in the 1860s. On the eve of the First World War their number grew to seventeen, among them the most important was the Rethymnis and Kulukundis from Kassos (R&K). The difference in ownership between these two contemporary steamship firms, Goulandris Brothers and S.G. Embiricos, is also illustrative through the list of shareholders. Aristidis and Georgios Goulandris held 42.5% and 39% respectively among eleven shareholders, two of which were their brothers who held together 8% and

the remainder came from their extended family or from other investors from Andros. In the Georgios M. Embiricos firm instead, there were in total 43 shareholders, of which Stamatios G. Embiricos was the managing owner holding 45.5%; members of his family held another 8%, 21 shareholders, mostly from Andros, had 24%, and seventeen foreign shipping professionals, mostly British, collaborating with S.G. Embiricos, had 22.5%. The social basis of the shareholders of S.G. Embiricos, clearly more cosmopolitan and wider in numbers, marks the deeper integration of the firm in the British and international markets. The establishment of the firm in a British port facilitated this integration, and demonstrates the expansive strategy of certain Greek shipping firms in the steamship era.

3 Ship Operation Management

3.1 *The Ship Operation Services Network*

Ship operation services are an unexplored, but fundamental aspect of shipping. Ship operation services were, since the age of sail, and have been up to now, a *sine qua non* component of the mechanism of the shipping industry. These services include the supply of food, bunkering, working materials and equipment, freight and insurance agency, ship repairing, towing, piloting, and everything else related to shipping operation.[30] The professions and businesses engaged in these services encompass specialized merchants in maritime stores, known as ship chandlers, as well as ship agents, coal/fuel merchants, ship repairing and engineering firms, tugboat companies, water suppliers, and stevedores among the most important. Ship operation services, an industry within an industry, played a vital role in the operation and economic performance of a ship, and occupied an important share of the operation costs. Despite that, the subject seems much neglected by historians and maritime economists alike.[31]

30 The term "ship operation services" was adopted here as the most appropriate to describe these types of services provided within the shipping industry. There is no established term for this to be found in scholarly works nor on business websites, except the term "ship side services" used in the website https://www.maritimeinfo.org/en/Maritime-Directory/ship-side-services (accessed 20 June 2021).

31 No mention of such businesses, not even those of the well-known profession of ship chandlers, can be found in reference works such as John J. Hattendorf (ed.), *The Oxford Encyclopedia of Maritime History* (New York: Oxford University Press, 2007); nor in Martin Stopford, *Maritime Economics* (London and New York: Routledge, 1997), or in any other publication. Among the very few publications to my knowledge that mention them are: Fritz Redlich, "Some remarks on the business of a New York ship chandler in the 1810s," *Business History Review*, 16, no. 5 (November 1942): 92–98; Orhan Emre Elma and Ahmet

The evidence for *s/s Georgios M. Embiricos* provides detailed information of the businesses and professionals the ship transacted during 33 voyages, from 22 July 1908 to 6 June 1916, when she visited 50 ports and carried out transactions with 257 firms of this sector.[32] Some of the professionals that served the ship maintained their collaboration throughout her working life, especially in regularly visited ports, like Cardiff, which were also the UK headquarters of the firm. These business ties were enhanced by the fact that some of these professionals, or members of their families, purchased shares in the ship. In fact, a list of shareholders of the *s/s Georgios M. Embiricos* includes foreign professionals who collaborated with the ship in the period 1908–16 such as: Pitman & Deane Ltd, London Underwriters and Brokers at Lloyds (5 shares), Short Brothers of Sunderland, the shipbuilders of the ship (3 shares), along with their family members Dorothy Thompson Short, Dora T. Short and Edith M. Short (1 share each), the ship chandlers Frazer & Co. of Cardiff (3 shares), the shipbroker W.H. Muller & Co of Rotterdam (1 share), the coal merchants Cory Brothers & Co. Ltd. of Cardiff (1 share), and F.H. Lambert of the coal exporters Lambert Brothers Ltd. of London (1 share).[33] This practice applied to all ships of the S.G. Embiricos as well as in ships of the extended family, like on the *s/s Leonidas* of Alkiviadis Embiricos, also built in 1896 by Short Brothers of Sunderland.[34] The purchase of shares of a ship by shipbuilders, contractors, or suppliers was not a novelty in the shipping industry; it existed already in the age of sail. However, the network of shareholders in some of the Greek ships—that included professionals and firms from ports ranging from the Black Sea to the Mediterranean and up to northern Europe and the UK—indicates the degree of integration of certain Greek ship-owning firms with their advent within the steamship economy.

3.2 *The Accounting System*

The condition of the account books of both sailing and steam ship firms from the 1860s to the 1910s reflects the level of organization, efficiency, and size of each firm. It shows not only the evolution of accounting during the transition

Hakan Özkan, "Turkish ship chandler companies: a marketing success or a disappointment?," *International Journal of Business and Management Invention*, 6, no. 6 (June 2017): 29–34.

32 A virtual reconstruction of the ship operation services network, created in the framework of the project SeaLiT (714437), is available at: http://www.sealitproject.eu/digital-seafaring http://isl.ics.forth.gr/FastCatTeam/templates/ship_chandlers.html.

33 Kaireios Library, Andros, Ναυτικά Αρχεία Εμπειρίκου, Folder Εξοφλήσεις [Quittances].

34 Kaireios Library, Andros, Νηολόγιο Άνδρου, 1878–1947, [Andros Port Registry], vol. B, αύξων αριθμός νηολογήσεως, reg. n. 1, 5, 6, 7, 8, 66, 67, 81 (in digitized form).

from sail to steam, but also the level of sophistication between contemporary firms. The book keeping of the examined case studies was based on a double entry system, including cost category and revenues-expenses analysis. The voyage was the unit of accounting analysis in tramp shipping. Its origins lay in the single ship voyage venture of the late medieval or early modern period, where ship partners and capital investors in the cargo at the end of the voyage cleared the accounts and divided profits and losses.[35] The voyage remained, however, the unit of accounting analysis also in tramp shipping in the period of steam, and dividends to shareholders were paid on this basis.[36] The expenses were calculated per each port the ship touched during the voyage and, according to Boyce, shipowners could compare the costs of using individual ports.[37]

In the accounts of the sailing ships *Tripolina* and *Eleni Koupa* the expenses per port were grouped in: wages; food expenses; equipment and repairs for the vessel; port, sanitary and consular expenses; extraordinary expenses, comprising commissions, brokerage, telegrams, steam ferries transfers, currency exchange costs, ballast costs, and sundry expenses, namely consumables like firewood, coal or matches, tools for cooking and cleaning, etc. Loading and unloading expenses were included within the extraordinary expenses, while insurance is completely missing. In the steamers, new cost categories were added, such as coal and insurance, as well as loading and unloading, shipping and agency costs, currency exchange costs, while hull and engine equipment and materials and repairing were listed as distinct categories. Only on the *s/s Georgios M. Embiricos* as in all ships of S.G. Embiricos, running costs (namely wages), coal, equipment, material and repairs, insurance, telegrams, administration, and dispatch were also calculated on a per day basis. This type of calculation of running costs, according to Boyce, permitted some British shipowners after 1900 to provide "the means to relate operating variables to financial plans".[38]

The comparison of the accounting systems between the two contemporary steamers *Georgios M. Embiricos* and *Leonardos G. Goulandris* shows the great

35 Gordon Boyce, "Accounting for managerial decision making in British shipping, 1870–1918," *Accounting, Business and Financial History*, 5, no. 3 (1995): 364–65; Giovanni Pellegrini (ed.), *'Salariato' della nave Girarda-San Nicolò per il viaggio da Venezia alla Sardegna (1594–1595)* (Rome: Viella, 2012); Robert Luther, "Uniform accounting periods: an historical review and critique," *Accounting History* 8, no. 5 (2003): 81.

36 Kaireios Library, Andros, Ναυτικά Αρχεία Εμπειρίκου, [Maritime Archives of Embiricos (S.G. Embiricos)], Μπαούλο ν. 1, [Box n. 1], α/π Γεώργιος Μ. Εμπειρίκος (1904–16), [ss Georgios M. Embiricos (1904–16)], Folder Μερισματαποδείξεις αρ. 35–38 (1913), αρ. 46, 48–49 (1916) [Receipts of paid dividends]; Boyce, "Accounting for managerial", 365–66.

37 Boyce, "Accounting for managerial", 368.

38 Boyce, "Accounting for managerial", 367.

differences in business organization and efficiency. The accounting system of the S.G. Embiricos was by far the most up to date, sophisticated, transparent, and complete, even by today's accounting standards. Captains and first engineers were provided with three types of standardized sheets to compile: one for the crew list and payroll, one log of the revenues-expenses, and one called the "abstract of sailing and engine logs", which included the route, the distance and time from port to port, weather conditions, and the performance and consumption of the engine. This information, along with the charter party, and all the receipts of the expenses made at each port, were processed in the offices of the firm and produced typed balance sheets, one in English and one in Greek. The balance sheets contained the period of the voyage, the time spent at sea and at shore, the freight, revenues and expenses per port and per category of cost, the profit and loss account, the reserve amount, and the dividends for each voyage. In the *Leonardos G. Goulandris* however, the registration of the accounts is in handwritten form in ledgers and books, and does not differ from those of the *Tripolina* and *Eleni Koupa* a few decades before. In addition, the accounts of this steamer are written in a disorganized and confusing manner. Vital cost categories, such as insurance (written in separate parts of the ledger) and sometimes even coal, were not included in the calculation of the voyage expenses. Profit and loss per voyage are registered among other calculations in various random parts of the books.

4 Operation and Performance

4.1 *Trade Routes and Voyage Turnover*

In the nineteenth century, Greek-owned ships operated mainly from the Black Sea to western Mediterranean ports carrying cereals and other bulk cargoes.[39] The two sailing ships of Kaloyannis also followed this same pattern. In four out of the six documented voyages of the *Tripolina* from 1861 to 1864 it carried cereals from the Danube, mainly Braila, to Naples, Livorno, Castellammare di Stabia, and Marseilles, one from Taganrog to Marseilles, and in one instance from Burgas to Castellammare di Stabia. The *Eleni Koupa*, in seventeen voyages from 1878 to 1887, carried cereals from the ports of Azov, mainly from Berdyansk (ten times), Yeysk (three times), Kosa Sazal'nikskaya (twice), and twice from Nikolayev (today Mykolaiv). The destination ports were principally Marseilles (eleven times), Tarragona (three times), and once to Messina, Malta, and Piraeus. It seems that early cargo steamers followed the same routes:

39 Harlaftis, *A History of Greek-Owned Shipping*, chapter 1.

the *Thiresia*, a rather small steamer of 580 tons, built in 1869, and bought by Foscolo & Mango in 1887, sailed exclusively within the Mediterranean and Black Seas between 1888 and 1890 (see Map 12.1a). However, at the turn to the twentieth century, Greek cargo steamers expanded their routes to the North Sea and UK ports, and occasionally beyond to South American ports.[40] The new pattern that emerged during the first two decades of the twentieth century (as in the trade routes of the *s/s Leonidas* of 1,748 tons, of Alkiviadis Embiricos in Map 12.1b) was the carrying of cereals from the Black Sea to north-western ports (Bremen, Rotterdam, Antwerp) and then with coal from UK ports, mainly Welsh ones (Cardiff, Newport) to the Mediterranean (Genoa, Marseilles, Piraeus). This pattern of the transport of Welsh coal (the best quality) to the bunkering stations in the Mediterranean was already operative in the last quarter of the nineteenth century. Evidence from recent research has also shown that sailing ships from the Italian port of Camogli were involved in the import of Black Sea cereals and the export of Welsh coal from Britain by the 1860s.[41] According to Robin Craig, the linkage between the Welsh coal trade to the Mediterranean and the Black Sea trade, played a vital role in the sustainability and growth of British tramp shipping, not only by eliminating intermediary voyages on ballast, but also by increasing profitability.[42]

The routes of the *s/s Leonardos G. Goulandris*, however, show a somehow different pattern. Most of the destinations of the cereals from the Black Sea were Mediterranean ports, as in the period of sail. Only once did the ship carry cereals to Rotterdam, and in eighteen voyages out of a total of 78 of the documented period 1902–15 did the ship sail to and from a British port (Map 12.2a). The routes of the *Georgios M. Embiricos*, on the other hand, not only correspond to the general pattern of the transport of cereals from the Black Sea to north-western European ports and of coal from UK ports to the Mediterranean, but also in some voyages expanded far beyond them. In fact, as Map 12.2b

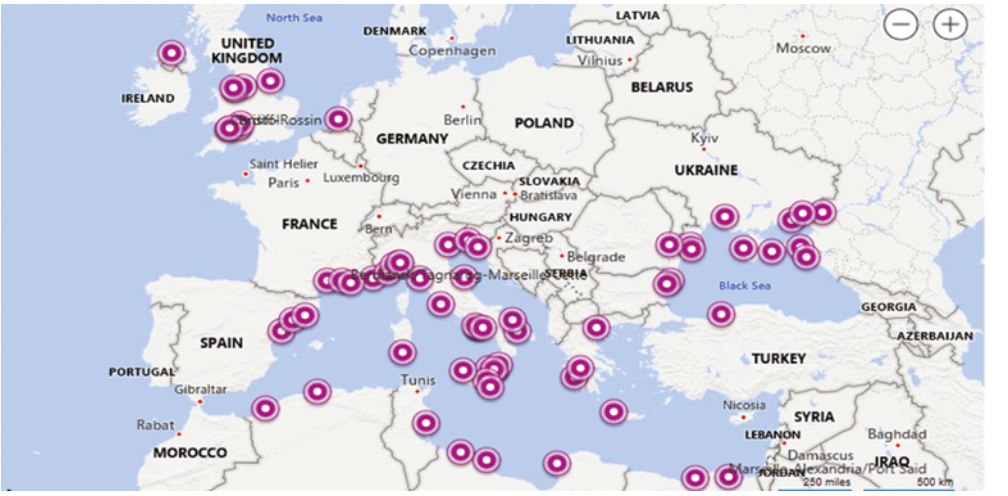
40 Hellenic Literary and Historical Archive, Athens, Αρχείο Σύρμα [Syrmas Archive], 4, Ημερολόγιο ΚΑΡΔΙΦ-ΡΙΟ ΙΑΝΕΡΙΟ-*BUENOS AIRES*-ΛΟΝΔΙΝΟ, Πλοίαρχος Αναστάσιος Σύρμας *18/2/1896–30/12/1896* [Logbook Cardiff-Rio de Janeiro-Buenos Aires-London, Captain Anastasios Syrmas], 5, Ατμόπλοιον Δ .Σ. Σκυλίτσης Βιβλίο Εσόδων Εξόδων *28/9/1895–19/10/1896*, 6, Ταμείον Ατμοπλοίου Δ .Σ. Σκυλίτσης 3/10/1898–16/5/1900, 7, Ταμείον Ατμοπλοίου Δ .Σ. Σκυλίτσης 8/5/1900–13/3/1903 [Account Books of the Steamer *Demetrio S. Schilizzi*, 1895–1903].

41 Leonardo Scavino, *The Mediterranean Maritime Community of Camogli: Evolution and Transformation in the Age of Transition from Sail to Steam (1850s–1910s)* (PhD diss., University of Genoa, 2020), 113, 116–18.

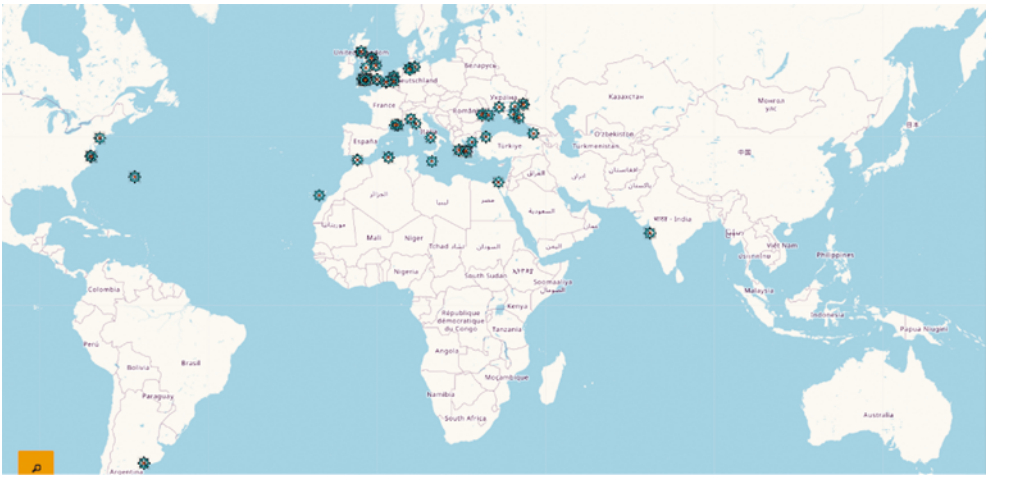
42 Craig, "Aspects of tramp shipping," 216–17. This pattern of cereal-coal freight is already attested in the 1860s.

MAP 12.1A Routes of the steamer *Thiresia*, 1888–1890

MAP 12.1B Routes of the steamer *Leonidas*, 1904–1906
SOURCES: PROCESSED DATA IN HTTPS://ISL.ICS.FORTH.GR/FASTCATTEAM/TEMPLATES/SHIP_MAP.HTML FOR THE *S/S THIRESIA*: MARIA KONSTANTINIDIS, *Δυο Ναυτικά Ημερολόγια του τέλους του 19ου αιώνα. Του Ιστιοφόρου* «Αλέξανδρος Γ΄» (*1884–1888*) από το Ναυτικό και Ιστορικό Μουσείο Γαλαξειδίου και του Ατμοπλοίου «Θηρεσία» (1888–1890) από τη Βιβλιοθήκη «Ο Κοραής» της Χίου» [*TWO SHIP LOGBOOKS OF THE LATE 19TH CENTURY. THE SAILING SHIP* ALEXANDROS THE THIRD (*1884–1888*) *FROM THE MARITIME AND HISTORICAL MUSEUM OF GALAXIDI AND THE STEAMSHIP* THIRESIA (*1888–1890*) *FROM THE KORAIS LIBRARY OF CHIOS.*] (MA DISS., IONIAN UNIVERSITY, 2007). FOR THE *S/S LEONIDAS*: HELLENIC LITERARY AND HISTORICAL ARCHIVE, ATHENS, Αρχείο Σύρμα [SYRMAS ARCHIVE], 9, Ημερολόγιον του ελλ. Ατμοπλοίου Λεωνίδας κυβερνούμενου παρά του Πλοιάρχου Λεωνίδα Κονδύλη [LOGBOOK OF THE STEAMER LEONIDAS, OF THE CAPTAIN LEONIDAS KONDYLIS], 17 JULY 1904–4 MAY 1906



MAP 12.2A Routes of the steamer *Leonardos G. Goulandris* 1902–1915
SOURCE: PROCESSED DATA FROM KAIREIOS LIBRARY, ANDROS, Ναυτικά Αρχεία, *Ισολογισμοί και Ταμείον Ατμοπλοίου Λ.Γ. Γουλανδρής* [BALANCE SHEETS AND GENERAL LEDGER OF THE SS *LEONARDOS G. GOULANDRIS*] AND *LEDGER* [A BOOK BELONGING TO THE *SS LEONARDOS G. GOULANDRIS* CONTAINING THE INVENTORY OF SHIP OPERATION SERVICES FIRMS, VOYAGE BALANCE SHEETS AND OTHER ACCOUNTS]



MAP 12.2B Routes of the steamer *G.M. Embiricos* 1908–1916
SOURCE: HTTP://ISL.ICS.FORTH.GR/FASTCATTEAM/TEMPLATES/SHIP_CHANDLERS.HTML

indicates, during the period 1908–16, the geographical areas of operation of the ship included the Black Sea (nine ports), the Mediterranean (thirteen ports), north-western Europe (21 ports), the North Atlantic (five ports), South Atlantic (one port) and India (one port).

Voyage turnover, usually calculated by the number of voyages per year, was a determining factor of a ship's performance. However, what was considered a complete voyage varied in each of the examined case studies. In the two sailing ships, the *Eleni Koupa* and *Tripolina*, a voyage started and terminated from the port where the ship did the necessary preparations: Hydra, Piraeus, or Istanbul. In fewer occasions, a voyage terminus was considered the port where the cargo was unloaded: Marseilles or an Italian port. On the *Georgios M. Embiricos* route, for example, from Britain to the Mediterranean and another from the Black Sea to northern Europe was counted as one voyage. On the *Leonardos G. Goulandris*, on the other hand, one voyage was considered a route from a Black Sea or British port to a Mediterranean port. This explains the fact that during their working lives the *Georgios M. Embiricos* registered 50 voyages and the *Leonardos G. Goulandris* 79 voyages.

The advent of cargo steamers greatly increased the performance of ships in the voyage turnover. The average duration of the voyages of the two sailing ships *Eleni Koupa* and *Tripolina*, was approximately 172 days, which means roughly two voyages per year. On the *Leonardos G. Goulandris* the average duration of the voyage was 45 days, which makes 7.5 voyages per year in peace time. In 1913, during the Balkan Wars, the *Leonardos G. Goulandris* made only two voyages, the rest of the year it was twice requisitioned by the Greek Navy and twice was under repair, whereas in 1914, after four voyages, it was damaged and under repair again. After five voyages, on 6 December 1915 the ship was torpedoed by the U-boat 39, 150 miles off Alexandria in Egypt.[43] The *Georgios M. Embiricos* made approximately four voyages per year lasting on average 90 days, double that of the *Leonardos G. Goulandris*, but this is due, as explained above, to the way the voyage was calculated. The *Georgios M. Embiricos* was also requisitioned in December 1912 for 21 days, and from May 1914 up to her last voyage in October 1916, when it was torpedoed by U-boat 29 on 22 October 1916 off the south-west coast of England, while carrying coal to Greek and Mediterranean ports from British and US ports, which was related perhaps to the war effort.[44]

43 http://www.teesbuiltships.co.uk/view.php?year_built=1896&builder=5027&ref=168757&vessel=CHISWICK ; https://uboat.net/wwi/ships_hit/3421.html (accessed 29 June 2020).

44 https://uboat.net/wwi/ships_hit/2429.html (accessed 19 September 2020).

4.2 *Voyage Operation Costs*

The importance of ship operation costs experienced structural change in the transition from sail to steam in Greek-owned shipping (Table 12.4). In the two sailing ships from 1861 to 1887, wages were by far the most important expense, reaching almost 40% of all expenses in the case of the *Tripolina*. In the two steamers, however, wages decreased to the fifth-most important expense, with less than 15% of all expenses. The decrease in the percentage of wages on steamers is even more remarkable since crew size on tramp steamers was almost double that of a sailing ship with the addition of the engine crew. In addition, food costs, which are related to the labour force, occupied a high share in both sailing ships; in the steamers, it took only a small percentage. The category of "extraordinary expenses", which comprised a variety of expenses in the sailing ship accounts, diminished considerably in the accounting of steamers, since many of these expenses, like commission costs, constituted a distinct category. In the new reality of the steamship economy, coal, and then insurance, occupied the highest percentage of the total cost. The case of coal in particular demonstrates the importance of energy as the most determining cost factor in ship operation up to the present day. In fact, coal was the highest voyage cost for British tramp shipping firms as well in the same period, with percentages very close to those of the Greek steamers in Table 12.4.[45] Insurance, on the other hand was totally absent as a cost in the case of the two sailing ships. Furthermore, the high percentage of loading and unloading costs in the accounts of the steamers, which occupied a small part of the extraordinary expenses in the sailing ship's costs, shows the further specialization and professionalization of the port services towards the necessity for higher turnover of ships in the steam era. In absolute numbers, the voyage operation costs increased enormously from the sail to the steam economy. The steamer *Leonardos G. Goulandris* had on average two-and-a-half times (23,585.50 francs), and the *Georgios M. Embiricos* (97,606.25 francs) ten-times higher operation costs, than the brig the *Eleni Koupa* (*c.*9,493 drachmas).

45 Boyce, "Edward Bates and Sons," 29. In the firms of Bates and Johnson's tramp operations, coal accounted for 27% and 23.6% respectively.

TABLE 12.4 Cost structure of the schooner *Tripolina* (*TR*) 1861–1864, of the brig *Eleni Koupa* (*EK*) 1878–1887 and of the steamers *Georgios M. Embiricos* (*GME*) 1904–1916 and *Leonardos G. Goulandris* (*LGG*), 1903–1915

Type of Expense	TR	EK	GME	LGG
Coal			22.7	21.53
Insurance Costs			16.8	16.19
Loading and Unloading			16.4	14.41
Port Expenses and Agent Costs	12.5	15.5	13.5	17.30
Wages	39.4	33.9	10.3	13.45
Commission Costs			8	5.60
Vessel Maintenance	17.2	13.2	5.6	5.28
Food Costs	18	14.1	3.6	4.20
Extraordinary Expenses	13.4	18.6	0.3	0.87
Currency Exchange Costs			0.2	0.69
Dispatch			1.7	
Administration Expenses			0.3	
Sundries	4.4	4.7		

SOURCE: PROCESSED DATA FROM PRIVATE ARCHIVE OF EVANGELOS RAFALIAS, HYDRA, «Κατάστιχον των εξόδων και εσόδων της ελληνοεμπορικής γολέτας Τριπολίνα» AND «Μισθοδοσίαι του πληρώματος της ελληνοεμπορικής γολέτας Τριπολίνα», [ACCOUNTS AND PAYROLL OF THE SCHOONER *TRIPOLINA*]; JOURNAL (ACCOUNT BOOK OF THE BRIG *ELENI KOUPA*, 1878–87; KAIREIOS LIBRARY, ANDROS, Ναυτικά Αρχεία Εμπειρίκου, Μπαούλο ν. 1, SS GEORGIOS M. EMBIRICOS (1904–16); Ναυτικά Αρχεία, *Ισολογισμοί και Ταμείον Ατμοπλοίου Λ.Γ. Γουλανδρής* AND *LEDGER*.

4.3 *Profitability*

Tramp shipping was a profitable business for both the sailing ships and the steamers in the examined case studies (Charts 12.2, 12.3a and 12.3b). The profit trend lines in all cases are clearly upward. The least upward trend is that of the *Tripolina*, of which there is evidence for only six voyages. However, it is important to note that both sailing ships in all but one voyage of the *Eleni Koupa*, made profits. During the years of available documentation for the *Eleni Koupa*, 1878–87, freight rates were in slight decline, on average 2.78 francs/kilo Istanbul,[46] and rose considerably only on two voyages from October 1881 to

46 1 Kilo of Istanbul equals 0.025 of a metric ton, according to Tryfonas Konstantinidis, Καράβια, καπεταναίοι και συντροφοναύται, *1800–1830*. Εισαγωγή εις την ιστορίαν των ναυτικών

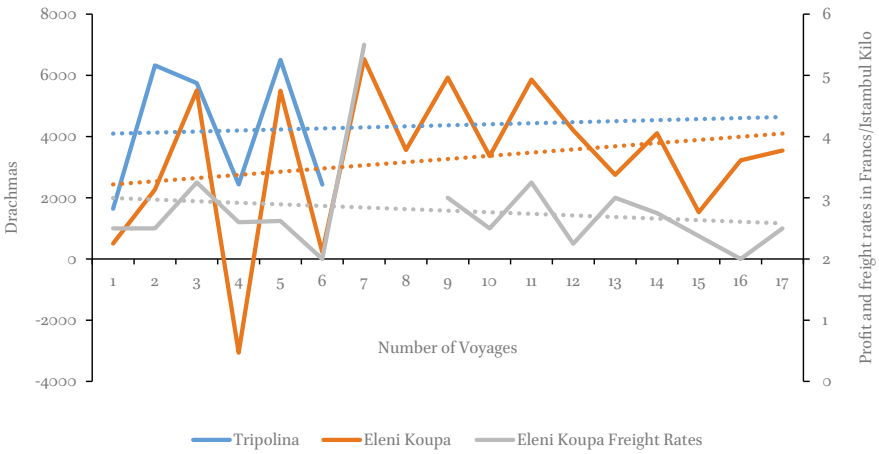


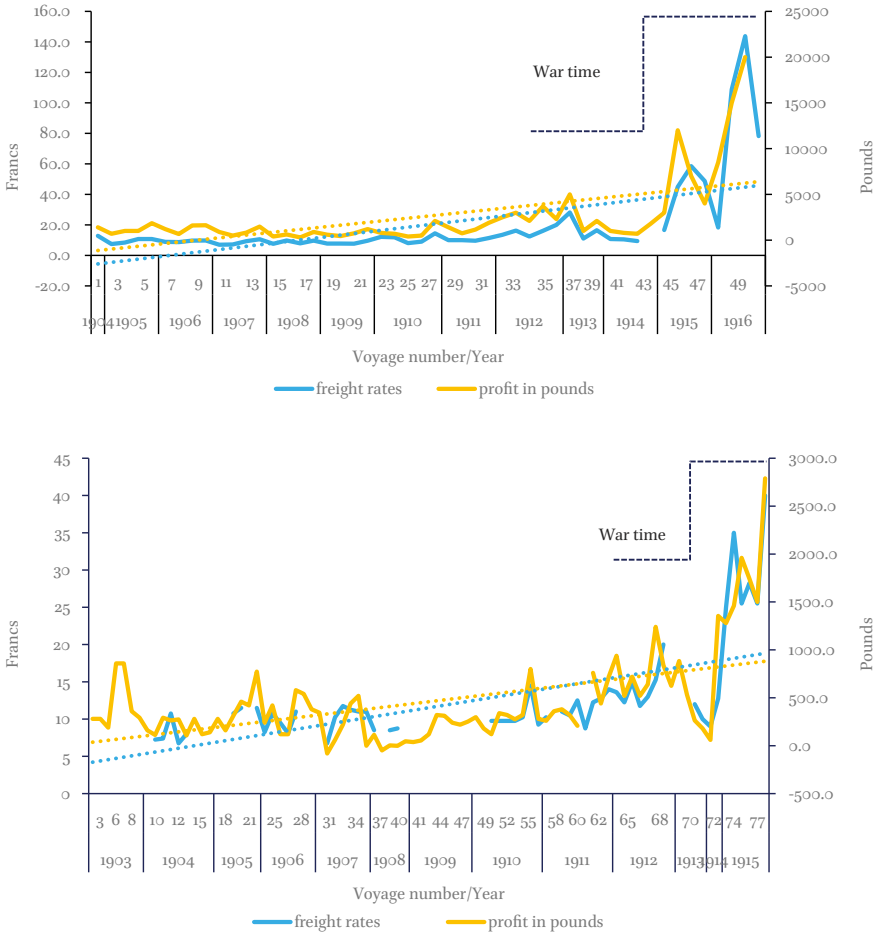
CHART 12.2 Net profit of *Tripolina* in drachmas (6 voyages, 1861–1864) and *Eleni Koupa* in francs (17 voyages, 1878–1887)
SOURCE: PROCESSED DATA FROM PRIVATE ARCHIVE OF EVANGELOS RAFALIAS, HYDRA, Κατάστιχον Των Εξόδων AND Μισθοδοσίαι; *JOURNAL*

September 1882 before returning to the previous rates. In contrast with the freight rates, the trend line of profit is clearly upward, indicating that sailing ships were able to be a sustainable and profitable business even in a period of lower returns and despite the growing antagonism of cargo steamers.

In the case of the two steamers, the *Georgios M. Embiricos* and *Leonardos G. Goulandris* the percentage of freight rates and net profits were steadily rising through the examined period (see Charts 12.3a and 12.3b). However, there is a clear difference between the first decade of the twentieth century and the war years from 1913 onwards. The period after the end of the Boer War in 1902 up to 1910 experienced a recession in freight rates due to the oversupply of tonnage at world level. This recession was reflected in the coal freight of some determining routes, such as South Wales to Genoa, as well as in the earnings of certain tramp shipping firms. The recovery in both freight rates and earnings of British tramp shipping firms came after 1910 and continued up to the First World War. This trend almost coincides with the case of the Greek steamers that begun slightly later, from 1913 and rocketed in 1915–16.[47] Despite the

επιχειρήσεων του Αγώνος [*Ships, Captains and Fellow Seamen, 1800–1830. Introduction to the History of Naval Operations during the Greek War of Independence*] (Athens: Edition of the History Service of the Greek Royal Navy, 1954), 559.

47 Boyce, "The growth and dissolution," 108, and Appendix 3a; idem, "Edward Bates and Sons," 42–43.



CHARTS 12.3A AND 12.3B Comparison between percentage of freight rates (in francs) and net profit (in pounds) of the *Georgios M. Embiricos, 1904–1916* (*above*) and the *Leonardos G. Goulandris, 1903–1915* (*below*)
SOURCE: PROCESSED DATA FROM KAIREIOS LIBRARY, ANDROS, Ναυτικά Αρχεια Εμπειρικου, Μπαουλο N. 1, S/S GEORGIOS M. EMBIRICOS (1904–16); Ναυτικά Αρχεια, *Ισολογισμοι* AND *LEDGER*

clear-cut upward trend for both ships, especially in wartime, the difference in the scale of profits in favour of the *Georgios M. Embiricos* is striking. Up to 1915, the average profit of that ship per voyage was 1,325 British pounds. From 1915 up to her last voyage in 1916, the average profit peaked at almost 10,000 pounds. For the *Leonardos G. Goulandris* in contrast, up to 1914 the average profit was almost 350 pounds and only once exceeded 1,000 pounds. During the war years

of 1914–15, in its last seven voyages, it surpassed again the 1,000 pounds limit, with an average profit 1,726 pounds. However, these great profit differences do not come as a surprise, given the size and the level of business organization of S.G. Embiricos reflected in the accounting system, the partnership strategy and network, as well as in the far greater number of global trade routes the firm operated. Besides this, S.G. Embriricos was also a shareholder and mediator to Goulandris Brothers for the acquisition of the *Leonardos G. Goulandris*.[48]

Both steamers paid dividends to shareholders quite regularly, however, data on these payments for both ships is incomplete. For the *Georgios M. Embiricos*, from the very first voyage's balance sheet up to the end, a non-fixed percentage, usually under 10%, of the profit was detracted for the reserve fund of the ship. Up to voyage 17, in 1908, no dividend payment is indicated on the balance sheets. From then on, up to the last fatal voyage, in every voyage's balance sheet the amount of dividend per share in pounds to be paid was indicated. For the *Leonardos G. Goulandris* the price per share of the dividends is given only after 1911. The ship did not pay dividends at the end of each voyage, and some of the passive shareholders received dividends at higher prices than the others. Often, Aristidis and Georgios Goulandris, major shareholders, managing owners, and captains of the ship, received dividends from voyages other than those they paid to the rest of the shareholders. They also received higher revenues than the net profit of the voyage, and above the percentage of their shares.

Chart 12.4 shows that the *Leonardos G. Goulandris* paid dividends at irregular periods and not at all between 1913 and 1915, while the *Georgios M. Embiricos* was very consistent on that. However, what is striking is the difference in the price of dividend per share between the two ships. On the *Georgios M. Embiricos* the average dividend price/share from 1908 to 1915 was approximately 15 pounds, which massively increased in the last seven voyages in 1915–16 to 100 pounds. Yet, on the *Leonardos G. Goulandris*, the average for the years 1911–13 was 6.5 pounds, double the amount of the last three voyages in 1915.

These earnings were far below those paid by the *Georgios M. Embiricos*, but still secured, even to minor shareholders, a respectable revenue. The four 1% shareholders of the *s/s Leonardos G. Goulandris* (see Table 12.5) during the years 1911–15 earned a total of 4,160 francs, which makes 1,040 francs, or 42 pounds, per year. Two of the minor shareholders who were among the initial owners—Dimitrios G. Kalivrousis holding 1% and Ioannis Stefanou holding 0.5%—earned, during the whole working life of the ship (1902–15) 6,874 and 4,144 francs respectively.

48 Kairis Library, Andros, Νηολόγιο Άνδρου, 1878–1947 [Andros Port Registry], vol. B, αύξων αριθμός νηολογήσεως, reg. n. 9 (in digitized form).

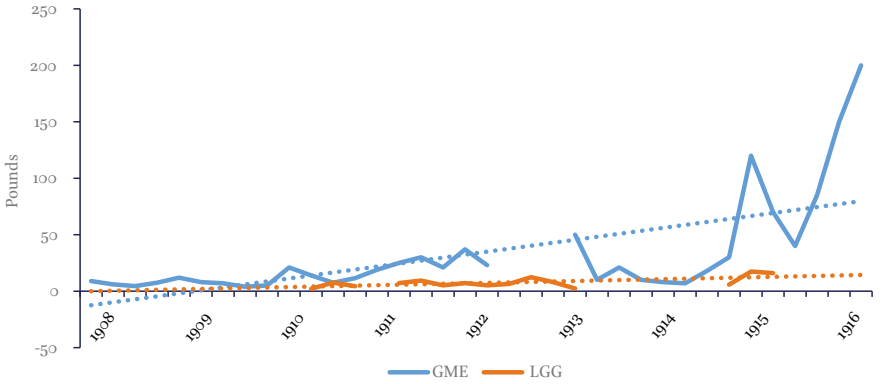


CHART 12.4 Price per share of dividends (in pounds) of *the Georgios M. Embiricos* (*GME*), 1908–1916 and the *Leonardos G. Goulandris* (*LGG*), 1911–1915
SOURCE: PROCESSED DATA FROM KAIREIOS LIBRARY, ANDROS, Ναυτικά Αρχεια Εμπειρικου, Μπαουλο Ν. 1, Γεωργιος Μ. Εμπειρικοσ, Εξοφλησεισ [QUITTANCES] AND Ναυτικά Αρχεια, *LEDGER*, 303–13

TABLE 12.5 Total revenues of the shareholders of the steamer *Leonardos G. Goulandris*

Shareholder	Percentage	Amount of dividends paid in French francs
Aristidis L. Goulandris	42.5%	163,776.40
Georgios L. Goulandris	39%	150,276.70
Alkiviadis L. Goulandris	4%	30,234.65
Epaminondas L. Goulandris	4%	33,664.32
Toouranio (Ourania) K. Goulandris	4%	33,664.32
Alexandros A. Embiricos	2%	24,082.75
Katina Z. Embiricos	1%	8,300.95
Dimitrios G. Kalivrousis	1%	6,873.60
Moscha S. Kambanis	1%	4,560.55
Michail A. Embiricos	1%	4,560.55
Ioannis Stefanou	½%	4,144.37

SOURCE: PROCESSED DATA FROM KAIREIOS LIBRARY, ANDROS, Ναυτικά Αρχεία, *LEDGER*, 303–13

5 Labour

Maritime labour experienced a great transformation during the transition from sail to steam. Steamships needed a distinct and specialized part of the crew for the working of the engines: engineers, firemen and trimmers, which formed a separate group working in a very different and harsh environment below deck, and not always in harmonious relations with the deck crew. In the passenger steamers a third category of personnel on board, that of the hotel and restaurant services, was added, which altered further the working environment, the nature of duties and skills, and the social and cultural composition of the maritime workers, if compared with the traditional complement of sailors in a sailing ship.[49] This transition to new realities for maritime workers is well depicted through the documentation of the above-mentioned cargo sailing and steamships from Hydra and Andros. This analysis addresses questions such as the size and synthesis of the crew, specialization, hierarchy, the wages and insurance of the crew, as well as career mobility and advancement.

5.1 *Size, Hierarchy, Wages and Labour Insurance*

In Table 12.6, the crew size and technical data of the four already mentioned ships are compared, in addition to two more Andros steamers, the *Nikolaos Vaglianos* and *Andriana*. *Nikolaos Vaglianos* was owned by the Vagliano Brothers, Argostoli, was sold in 1895 to Kleanthis A. Polemis, in partnership with the sons of Leonardos Goulandris, who bought second hand, in 1902, the *s/s Leonardos G. Goulandris*.[50] Alkiviadis Embiricos, uncle of Stamatios, owned *Andriana*,

49 The bibliography on the new forms of labour on board steamers is very extensive. Some of the indicative works include: R.G. Milburn, "The emergence of the engineer in British merchant shipping, 1812–1863," *International Journal of Maritime History*, 28, no. 3 (August 2016): 559–75; David M. Williams, "Industrialization, technological change and the maritime labour force: the British experience 1800–1914," *Collectanea Maritima*, no. 5 (1991): 317–30; Enric Garcia, "Losing professional identity? Deck officers in the Spanish merchant marine, 1868–1914," *International Journal of Maritime History*, 26, no. 3 (August 2014): 451–70; Enric Garcia Domingo, "Engine drivers or engineers: ship's engineers in the Spanish merchant navy (1834–1893)," *Journal of Mediterranean Studies* 19 no. 2 (2010): 249–70; Alston Kennerley, "Stocking the boilers: firemen and trimmers in British merchant ships, 1850–1950," *International Journal of Maritime History* 20, no. 1 (June 2008): 191–220; Conrad Dixon, "The rise of the engineer in the nineteenth century," in *Shipping, Technology, and Imperialism: Papers Presented to the Third British-Dutch Maritime History Conference*, eds. Gordon Jackson and David M. Williams (Brookfield, Vt.: Ashgate Pub. Co., 1996), 231–41; Laura Caruso Fermé, "Tripulantes del sur: trabajo y condiciones laborales en la navegacion mercante argentina (1890–1920)," *Drassana*, no. 24 (Desembre 2016): 27–44.

50 Bistis, Ο Ατμήρης εμπορικός στόλος, 50–51.

built in 1906 in Sunderland by the Short Brothers, like the s/s *Georgios M. Embiricos*.[51]

The size of the crew of the two medium tonnage sailing ships in the second half of the nineteenth century, the *Tripolina* and the *Eleni Koupa*, was between nine to eleven men. The composition of the crew included, on the *Tripolina*, a captain, a purser, a boatswain, a cook, four to seven seamen, and in two voyages one or two boys. On the *Eleni Koupa* a first mate also served in seven out of the fifteen voyages, and a purser and boys appeared in the crew list on six voyages. A captain, a cook, a boatswain, and almost the same number of seamen as on the *Tripolina* enlisted in all voyages. The addition of the engine crew on steamers a few decades later almost doubled the size of personnel on a cargo vessel. The size of the crew on a Greek-owned cargo steamer of the late nineteenth, early twentieth century was proportionate to age, tonnage, and engine power. The *Nikolaos Vaglianos* in 1898, built in 1883, the smallest of four steamers in terms of tonnage and engine power, and with a compound engine instead of a triple expansion one, had a crew of 21 men. Among the three contemporarily operating steamers, the older *Leonardos G. Goulandris*, built in 1896 and lower in tonnage and horsepower, had again the smaller crew. The relationship between tonnage/engine power and number of men is reflected in the number of seamen, firemen, and trimmers, since the rest of the specializations on board were covered by one person (See Table 12.9). In fact, the smaller number of firemen and trimmers on the *Nikolaos Vaglianos* and on the *Leonardos G. Goulandris* (3 and 2 respectively), vis à vis the other two ships (*Andriana* 4 and 4, *Georgios M. Embiricos* 4 and 3), must relate to the number of furnaces and boilers to feed, which is proportionate to the size of the engine.

The evidence for the wages from the two sailing ships of Kaloyannis shows that in both cases seamen received half the monthly wages of a captain. However, evidence from Syros from the period of the 1840s–60s, shows that the average monthly salary of a captain was remarkably stable over the course of the nineteenth century, between 100 to 120 drachmas.[52] In fact, according to Table 12.7a, from 1860s to 1880s, among the constantly present ranks on board,

51 http://www.sunderlandships.com/view.php?official_number=&imo=&builder=&builder_eng=&year_built=&launch_after=&launch_before=&role=&type_ref1=&propulsion=&owner=&port=&flag=&disposal=&lost=&ref=103588&vessel=ANDRIANA (accessed 19 November 2020).

52 Apostolos Delis, "Le rôle du capitaine et la figure du 'directeur' de navires dans la marine à voile à Syra au milieu du XIX^{e} siècle," in *Entrepreneurs des mers. Capitaines et mariniers du XVI^{e} au XIX^{e} siècle*, eds. Gilbert Buti, Luca lo Basso, and Olivier Raveux (Paris: Riveneuve Editions, 2017), 184.

TABLE 12.6 Crew size and technical data of two Hydra sailing ships and four Andros steamers

Ship name	*Tripolina* (*1861–64*)	*Eleni Koupa* (*1878–87*)	*Nikolaos Vaglianos* (*1898*)	*Leonardos G. Goulandris* (*1911–15*)	*Andriana* (*1908–09*)	*Georgios M. Embiricos* (*1908–16*)
Crew size	9–11	9–11	21	22–24	26–27	27–28
Tonnage	186	276	1693 grt/ 1101 nrt	2123 grt/ 1312 nrt	2958 grt/ 1769 nrt	3636 grt/ 2324 nrt
Engine type and horsepower			CI2cyl (33 & 62 × 42in), 170nhp	T3cyl (21, 34, 56 × 36in), 187nhp	T3cyl (24, 39, 65 × 42in), 298nhp	T3cyl (25, 42, 68 × 45in), 324nhp

SOURCE: PROCESSED DATA FROM PRIVATE ARCHIVE OF EVANGELOS RAFALIAS, HYDRA, Κατάστιχον των εξόδων AND Μισθοδοσία AND *JOURNAL*; KAIREIOS LIBRARY, ANDROS, Ναυτικά Αρχεία Εμπειρίκου, Μπαούλο ν. 1; Ναυτικά Αρχεία, *Ισολογισμοί* AND *LEDGER*; HELLENIC LITERARY AND HISTORICAL ARCHIVE (ELIA), ATHENS, Αρχείο Σύρμα, Βιβλίο Μισθοδοσίας Πληρώματος, Α/Π *Ανδριάνα, 23/6/1908–16/4/1909* [SYRMAS ARCHIVE, SALARY BOOK OF THE CREW OF THE *S/S ANDRIANA*]. HTTP://WWW.TEESBUILTSHIPS.CO.UK/VIEW.PHP?YEAR_BUILT=1896&BUILDER=5027&REF=168757&VESSEL=CHISWICK; HTTPS://UBOAT.NET/WWI/SHIPS_HIT/3421.HTML; HTTP://WWW.SUNDERLANDSHIPS.COM/VIEW.PHP?OFFICIAL_NUMBER=&IMO=&BUILDER=&BUILDER_ENG=&YEAR_BUILT=&LAUNCH_AFTER=&LAUNCH_BEFORE=&ROLE=&TYPE_REF1=&PROPULSION=&OWNER=&PORT=&FLAG=&DISPOSAL=&LOST=&REF=103588&VESSEL=ANDRIANA; HTTP://WWW.SUNDERLANDSHIPS.COM/VIEW.PHP?OFFICIAL_NUMBER=&IMO=&BUILDER=&BUILDER_ENG=&YEAR_BUILT=&LAUNCH_AFTER=&LAUNCH_BEFORE=&ROLE=&TYPE_REF1=&PROPULSION=&OWNER=&PORT=&FLAG=&DISPOSAL=&LOST=&REF=103572&VESSEL=GEORGE+M.+EMBIRICOS, HTTP://WWW.SUNDERLANDSHIPS.COM/VIEW.PHP?OFFICIAL_NUMBER=&IMO=&BUILDER=&BUILDER_ENG=&YEAR_BUILT=&LAUNCH_AFTER=&LAUNCH_BEFORE=&ROLE=&TYPE_REF1=&PROPULSION=&OWNER=&PORT=&FLAG=&DISPOSAL=&LOST=&REF=100267&VESSEL=NICHOLAS+VAGLIANO (ALL ACCESSED 29 JUNE 2020); GELINA HARLAFTIS, *CREATING GLOBAL SHIPPING. ARISTOTLE ONASIS, THE VAGLIANO BROTHERS, AND THE BUSINESS OF SHIPPING, C.1820–1970* (CAMBRIDGE: CAMBRIDGE UNIVERSITY PRESS, 2019), TABLE 5.3, 137

the captain and seamen had the lowest rate of increase in monthly wages, whereas boatswain and cook had the highest.

The evolution of the wages of the deck specializations from sailing ships to steamships over 25 to 30 years, as depicted in Table 12.7b, shows greater changes. The monthly salary of a captain on a steamship increased almost two-and-a-half times of that on a sailing ship, and more than any other among the deck crew, an important indication of the deepening of the differences of hierarchies on board. However, this remarkable rate of increase in the salaries of all ranks includes the almost doubling of wages during the war years, after 1913.

TABLES 12.7A AND 12.7B Average monthly wages of deck crew on sailing and steamships (12.7a in drachmas, 12.7b in French francs)

Rank	*Tripolina* (*a*)	Range of wages	*Eleni Koupa* (*b*)	Range of wages	% increase (a)/(b)
Captain	120	120	132.5	120–144	9.4
First mate			120	96–144	
Purser	82.5	60–140	94.3	70–120	12.5
Boatswain	70	60–75	89	80–96	21.3
Cook	56.4	50–70	73.3	55–72	23.0
Seaman	56	42–60	65.3	48–78	14.2
Boy	18.5	15–30	28.7	18–48	35.5

Rank	*Eleni Koupa* (*a*)	*Andriana* (*b*)	*Leonardos G. Goulandris* (*c*)	*Georgios M. Embiricos* (*d*)	% increase (a)/(average increase of b+c+d)
Captain	110.4	375.0	362.2	387.8	239.7
First mate	100.0	161.4	166.9	182.6	70.3
Boatswain	74.1	90.0	110.9	103.9	37.1
Cook	61.4	90.0	93.0	105.6	56.7
Seaman	54.5	64.8	80.1	85.0	40.7
Boy	20.7	36.4	30.6	36.9	67.3

SOURCES: PROCESSED DATA FROM PRIVATE ARCHIVE OF EVANGELOS RAFALIAS, HYDRA, Κατάστιχον των εξόδων AND Μισθοδοσία AND *JOURNAL*; KAIREIOS LIBRARY, ANDROS, Ναυτικά Αρχεία Εμπειρίκου, Μπαούλο ν. 1; Ναυτικά Αρχεία, *Ισολογισμοί* AND *LEDGER*; ELIA, ATHENS, Αρχείο Σύρμα, *Βιβλίο Μισθοδοσίας*

In fact, if the rate of increase of the rank of seamen, between the four ships of the Table 12.7b, was based only on peacetime wages (1878–87 and 1908–12) it comes out at a rate of just under 20%, half of what resulted if wartime wages are included.

The comparison of wages among the four Andros steamers (Table 12.9), from the earliest, the *Nikolaos Vaglianos* of 1898, and ten years later, it seems that the monthly wages of all ranks either remained the same or decreased. The wages per rank reflect the hierarchy on board all ships under examination. As Chart 12.5 illustrates, in both steamers, there is a great gap between the level of wages of the highest officers, captain and first engineer, and the rest of

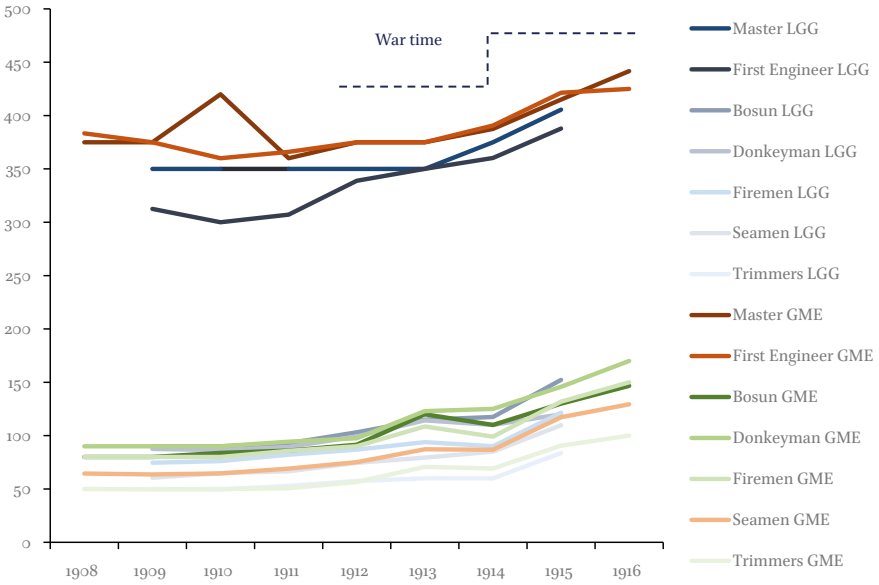


CHART 12.5 Course of wages (in French francs for specific ranks on the two steamers the *Leonardos G. Goulandris* (*LGG*) (1909–1915) and the *Georgios M. Embiricos* (*GME*) (1908–1916)
SOURCES: PROCESSED DATA FROM KAIRIS LIBRARY, ANDROS, Ναυτικά Αρχεία Εμπειρίκου, Μπαούλο N. 1; Ναυτικά Αρχεία, *Κατάσταση Μισθοδοσιών 1909* AND *LEDGER*

the middle and lower rank crew. The importance of the engine crew members vis à vis the deck ones is reflected in the higher wages of the second engineer against the first mate, of the third engineer against the second mate, and of the firemen against the seamen. Despite the declining trend in the percentage of labour costs, as discussed above (Table 12.4), the wages per rank (Chart 12.5) were rising after 1912 during the Balkan Wars and during the First World War. This considerable increase in wages in wartime must have been an international trend; this also occurred with British steamship firms, such as the Blue Funnel Line where wages during the First World War augmented by 50%.[53]

Crew members were paid in various instalments both on sailing ships and steamers, based on the evidence of the *Tripolina* and *Leonardos G. Goulandris*. They received the usual advance when they signed in, and had interim payments during the voyage in the ports of call. In addition, Kaloyannis, paid some

53 Malcolm Falkus, *The Blue Funnel Legend. A History of the Ocean Steam Ship Company, 1865–1973* (London: Macmillan, 1990), 114.

of the interim instalments directly to the families of the sailors from Hydra, while men were at sea. The payments in the ports of call were made in whatever currencies were available, usually those of the country of the port they arrived, such as kuruş (piasters) or Ottoman liras in Istanbul, French francs in Marseilles and in Italian Tyrrhenian ports, rubles in the Black Sea Russian ports, and pesetas in Spanish ports.[54] Often sailors received advances in kind, more frequently clothes on the *Tripolina*, tobacco on both ships, sugar, rice, and lottery tickets on the *Leonardos G. Goulandris* (when anchored in Andros). In the advances in kind, the equivalent amount was always registered in drachmas on the *Tripolina* and in French francs on the *Leonardos G. Goulandris*, the nominal currencies used in the two different periods the ships operated.

The Seamen's Pension Fund (Ν.Α.Τ. Ναυτικό Απομαχικό Ταμείο), founded in 1861, is the oldest worker's insurance fund in Greece and among the first worldwide. The history of the fund is analysed by Alkis Kapokakis in the present volume. However, for my research it is important to note that the payrolls of the *Tripolina*, which are contemporary with the foundation of the fund (1861–64), had registered the contributions of all men on board to the Seamen's Pension Fund. Yet, in the *Eleni Koupa's* payrolls, almost 15 to 25 years later, there is no mention of payment to the Seamen's Pension Fund.

Table 12.8 indicates the official contributions per rank to the Seamen's Pension Fund that reflects the hierarchies in salary on board, between higher, middle, and lower crew in the Greek cargo steamers in the early twentieth century. Despite the fact that the examined payrolls of the steamers *Andriana*, *Leonardos G. Goulandris*, and the *Georgios M. Embiricos* (Table 12.9), comply with the official rates of contributions, on the *Leonardos G. Goulandris* and *Georgios M. Embiricos* on some voyages, only in the ranks of second engineer and third engineer were some alterations upwards or downwards to the official rates recorded. Generally, the average cost of the contribution of the whole crew on the steamers (Table 12.9) was approximately 4–4.5%. However, based on the relationship between average monthly salary/rate of contribution per rank, it results that second mates paid the highest percentage (6.8% on average), the trainee seaman the second highest (5.8%), whereas the first engineer paid the lowest percentage (2.9%), followed by the captain (4%).

54 Data from Private Archive of Evangelos Rafalias, Hydra, Κατάστιχον; Kairis Library, Andros, Κατάσταση Μισθοδοσιών 1909.

TABLE 12.8 Monthly contributions to the Seamen's Pension Fund per rank on Greek ships

Rank	Drachmas per month
Master	15
First Engineer	10.5
Second Engineer	9
First Mate	9
Third Engineer	6
Second Mate	7.5
Bosun	4.5
Chief Fireman (Donkeyman)	4.5
Cook	3
Carpenter	3
Firemen	3
Steward (Θαλαμηπόλος)	3
Seamen	3
Trimmers	3
Trainee Seaman (*Μαθητευόμενος/Ναύτης μαθητευόμενος*)	3
Engine Steward/Servant/Cabin Boy of the Engineers (*Θαλαμηπόλος μηχανής ή μηχανικών/καμαρότος μηχανής/ Υπηρέτης μηχανικών*)	1.5
Boy (*Παις/Ναυτόπαις*)	1.5

SOURCE: *Εφημερίς της Κυβερνήσεως του Βασιλείου της Ελλάδος* [GOVERNMENT GAZETTE OF THE GREEK KINGDOM], Τεύχος Α', Αριθμός Φύλλου, 144, 21 Ιουλίου 1907, [ISSUE A, N. 144, 21.7.1907], 609–10. I AM VERY MUCH INDEBTED TO ALKIVIADIS KAPOKAKIS FOR PROVIDING ME WITH THIS SOURCE

5.2 *Recruitment and Mobility of the Crew*

The employment strategy and the management of the crews are reflected in the recruitment, the career pattern, and in the mobility of the men. In Greek ships, paternalistic strategies of the age of sail—to employ relatives, those from the same maritime community or the surroundings—also persisted on cargo steamers.[55] The data from the examined steamers unfortunately do not mention the origin of the crews. However, an examination of the family names indicates that an important number of them must have been from Andros, the place of origin of the shipowners. Yet, on the brig *Eleni Koupa*, the data shows that from out of 153 men that served on the ship from 1878 to 1887, 106 had

55 Harlaftis, *A History of Greek-Owned Shipping*, 178.

TABLE 12.9 Crew size per rank, salary (in French francs) and pension fund contribution in the Andros steamers: *Andriana* (*A*) (1908–1909), *Leonardos G. Goulandris* (*LGG*) (1909–1915), *Georgios M. Embiricos* (*GME*) (1908–1916), and the *Nikolaos Vaglianos* (*NV*) (1898)

Rank	Number of men				Range salary			Average salary				% Pension fund		
	NV	A	LGG	GME	A	LGG	GME	NV	A	LGG	GME	A	LGG	GME
Master	1	1	1	1	375	350–425	350–500	400	375	362.20	387.80	4.0	4.2	3.9
First Engineer	1	1	1	1	375–78	300–450	360–425	400	376	337.70	387.70	British engineer	3.1	2.7
Second Engineer	1	1	1	1	225	115–250	200–375	250	225	182.80	246.30	4.0	4.6	3.8
First Mate	1	1	1	1	160–70	120–250	140–250	200	161.4	166.90	182.60	4.8	5.9	5.2
Third Engineer	1	1	1	1	150	100–220	120–180	150	150	138.50	145.70	4.0	5.0	4.2
Second Mate	1	1	1	1	110	100–150	85–210	150	110	101.80	126.80	6.8	7.5	6.0
Bosun	1	1	1	1	90	90–162.50	80–150	100	90	110.90	103.90	5.0	4.2	4.5
Chief Fireman (Donkeyman)	1	1	1	1	90–95	85–150	90–170	100	90.7	101.50	112.30	5.0	4.2	4.0
Cook	1	1	1	1	90	70–150	70–180	85	90	93.0	105.60	3.3	3.4	3.0
Carpenter	1	1	1	1	85	80–95	75–160	90	85	83.70	103.80	3.5	3.6	3.3
Firemen	3	4	3	4	80	70–163	80–150	80	80	90.20	102.40	3.8	3.4	5.0
Steward (Θαλαμηπόλος)	1	1	1	1	75	40–130	70–150	90	75	82.70	92.40	4.0	3.7	2.9
Seamen	4	4–5	3–5	4–5	60–65	20–160	60–140	70	64.80	80.10	85.0	4.6	3.9	3.8
Trimmers	2	4	2	3	60	45–100	45–100	60	60	59.80	65.40	5.0	5.2	3.1
Trainee Seaman (Μαθητευόμενος/Ναύτης μαθητευόμενος)		1	1	1	50	25–80	40–90		50	43.60	56.70	6.0	6.2	5.0

TABLE 12.9 Crew size per rank, salary (in French francs) and pension fund contribution in the Andros steamers: *Andriana* (*A*) (1908–1909) (*cont.*)

Rank	Number of men				Range salary			Average salary				% Pension fund		
	NV	A	LGG	GME	A	LGG	GME	NV	A	LGG	GME	A	LGG	GME
Engine Steward/Servant/ Cabin Boy of the Engineers (Θαλαμηπόλος μηχανής ή μηχανικών/ καμαρότος μηχανής/ Υπηρέτης μηχανικών Θαλαμηπόλος μηχανής ή μηχανικών/καμαρότος μηχανής/Υπηρέτης μηχανικών)	1	1	1	1	30–35	15–70	20–60	50	30.60	28.0	35.80	4.3	6.8	5.1
Boy (Παι(Παις/Ναυτόπαις) ς/Ναυτόπαις)			1	1	35–45	20–45	20–60		36.40	30.60	36.90	4.0	5.3	4.9
Cadet (Δόκιμος Δόκιμος)				1			30–130				68.90			5.0
Steward of the Officers (Θαλαμηπόλος Αξιωματικών)		1		1			60				60.0			5.0

SOURCE: PROCESSED DATA FROM KAIREIOS LIBRARY, ANDROS, Ναυτικά Αρχεία Εμπειρίκου, Μπαούλο ν. 1; Ναυτικά Αρχεία, Κατάσταση Μισθοδοσιών 1909 AND LEDGER; ELIA, ATHENS, Βιβλίο Μισθοδοσίας; GELINA HARLAFTIS, *CREATING GLOBAL SHIPPING. ARISTOTLE ONASIS, THE VAGLIANO BROTHERS, AND THE BUSINESS OF SHIPPING, C.1820–1970* (CAMBRIDGE: CAMBRIDGE UNIVERSITY PRESS, 2019), TABLE 5.3, 137

their origin registered; from them 41 were from Hydra, 27 from the surrounding areas (Spetses, Kranidi, Poros, and Ermioni), and 38 were from other areas, mostly from the Aegean and a few foreigners. The areas of recruitment were Hydra, the port of departure and registry port of the ship, Istanbul, the *sine qua non* port of call for the Black Sea and Marseilles, and the most usual destination port. The high crew turnover for a medium sized sailing ship, and the fact that a considerable percentage of the men (35.8%) were recruited from distant areas, indicates a crack in the paternalistic practices of Greek shipowners. In addition, mobility enhances this hypothesis, since 85% of men only sailed one or two voyages, and only Stamatios Kaloyannis and his brother Michail, the owners, sailed more than ten voyages, alternating as captains, first mates, or pursers.[56]

The two best-documented steamers, the *Georgios M. Embiricos* and the *Leonardos G. Goulandris*, in a period of eight and six years respectively, employed a large number of men. However, the difference between them is huge: 511 in the former, 280 in the latter (see Table 12.10). Such a high turnover of the labour force, especially in the case of the *Georgios M. Embiricos*, reflects a stricter managerial policy towards labour costs and efficiency. In fact, as indicated in Table 12.4, the *Georgios M. Embiricos'* wage percentage in the cost structure was lower (10.3%) than that of the *Leonardos G. Goulandris* (13.45%), despite the fact that the former paid better wages, as shown in Table 12.9. Another indicator in the management of the ship is the number of captains: in the case of the *Georgios M. Embiricos* there were eight different ones from July 1908 to June 1916, and all of them were wage dependent employees. However, for the *Leonardos G. Goulandris*, the three brothers and owners of the ship alternated in the captaincy, a system that preserved traditional managerial practices of the period of sail.[57]

Half of the fully employed men on board the *Georgios M. Embiricos* worked for only one voyage, whereas on the *Leonardos G. Goulandris* the percentage with a single voyage accounted for 38%. Almost 14% of the fully employed men on the *Georgios M. Embiricos* worked for five voyages or more, whereas on the *Leonardos G. Goulandris* this percentage is 19%. Higher percentages also appear for the *Leonardos G. Goulandris* in the case of men who worked for three and four voyages (Table 12.10). Labour relations seem to be more stable in the latter ship, and are reflected in the much higher number of consecutive

56 Processed data from Private Archive of Evangelos Rafalias, Hydra, Journal [Account Book of the brig *Eleni Koupa*, 1878–87].

57 From December 1914 up to the sinking of the ship a year later, a Ioannis I. Goulandris took command; he was probably a family member, but has not been exactly identified.

TABLE 12.10 Career and mobility of the crew of the *Leonardos G. Goulandris* (*LGG*) (1909–1915), and the *Georgios M. Embiricos* (*GME*) (1908–1916)

Range of Voyages	Number of Voyages		% Number of Voyages		Rank Upgrade		% Rank Upgrade		Salary Upgrade		% Salary Upgrade		Fired		Jumped Ship	
	LGG	GME	LGG	GME	LGG	GME	LGG	GME	LGG	GME	LGG	GME	LGG	GME	LGG	GME
over 15	10	3	3.6	0.6	3	1	30.0	33.3	8	2	80.0	66.7	2			
11 to 15	3	6	1.1	1.2	2	4	66.7	66.7	2	6	66.7	100.0	1	1		
5 to 10	40	61	14.3	11.9	13	26	32.5	42.6	33	45	82.5	73.8	4	11		
4	27	30	9.6	5.9	4	11	14.8	36.7	15	18	55.6	60.0	4	2		
3	35	45	12.5	8.8	2	7	5.7	15.6	13	13	37.1	28.9	8	7		
2	58	109	20.7	21.3	2	10	3.4	9.2	12	19	20.7	17.4	14	14		1
1	107	257	38.2	50.3									11	32	3	3
total number of workers	**280**	**511**			**26**	**59**	**9.3**	**11.5**	**83**	**103**	**29.6**	**20.2**	**44**	**69**	**3**	**4**
total number of voyages	**46**	**33**														

SOURCE: KAIREIOS L SOURCES: PROCESSED DATA FROM KAIREIOS LIBRARY, ANDROS, Ναυτικά Αρχεία Εμπειρίκου, Μπαούλο ν. 1; Ναυτικά *Αρχεία, Ισολογισμοί και Ταμείον Ατμοπλοίου* Λ.Γ. Γουλανδρής AND *Κατάσταση Μισθοδοσιών 1909*

voyages of many crew members than on the. The percentage of men that advanced in rank during their working period on both ships is relatively low (11.5% on the *Georgios M. Embiricos* and 9.3% on the *Leonardos G. Goulandris*). Usually the advancement was by one rank, from trimmer to fireman, from fireman to donkeyman, from seaman to bosun, or from second mate to first mate, but did not exceed the ladder of hierarchy between lower crew, middle officers, and high officers. Salary upgrading on the *Leonardos G. Goulandris* reached almost 30% of the fully employed men, while on the *Georgios M. Embiricos* the figure was 20%. The percentages of fired men on both ships are similar (16% for the *Leonardos G. Goulandris* and 13.5% for the *Georgios M. Embiricos*), and is impressive given the much higher turnover of crew of the *Georgios M. Embiricos*. Finally, men on board the *Georgios M. Embiricos* spent almost twice as much time as those of the *Leonardos G. Goulandris* on voyages (86 days in the former and 44 in the latter), due to the far more distant trade routes the former operated.

6 Conclusions

This chapter has examined the evolution of ship operation in Greek-owned tramp shipping during the transition from sail to steam. The analysis included a medium sailing ship firm, for Greek standards, from a traditional maritime community, Hydra, that operated for almost 50 years from the heyday to the decline of the sailing ship. Moreover, two steamship firms, both started from Andros, of the two very different types, were examined: one large, long-lived and internationally based; the other a single ship company, of limited capital base and traditional in all respects. The evidence, based on accounting material, demonstrated structural changes and continuities in key aspects of their operation, such as organization and structure, performance, and labour.

In terms of ownership, the Greek-owned shipping firm developed from an average small-sized company, owned by a few persons and based on the Mediterranean system of 24 shares, into an enlarged base of shareholders of the 100 shares system. This enlargement, as seen in the case of S.G. Embiricos, was accompanied by structural innovations in the scope and function of the firm. The company established headquarters in the UK as well as in Greece, expanded to ship management along with ownership, and integrated as shareholders foreign, mainly British, partners from the shipbuilding and the ship operation services sector. The sophistication and complexity of the shipping business in the transition to the steam era is reflected in the accounting

methods and in the costs. The bookkeeping system, based on expenses and revenues per voyage, remained the same throughout the transition. However, new cost categories introduced in the steam era and the calculations became more detailed, accurate, and transparent. Of course, there was a difference between contemporary firms such as Goulandris Brothers and S.G. Embiricos, the latter having attained a very high level of sophistication in its accounting system, something that is absent in the former. The importance of cost factors had a structural impact on shipping management. In the sailing ship period, labour was the overwhelming cost factor, forming between one-third to less than half of the total expenses. The industrialization of shipping transformed cost factors, and before labour, coal, as today oil, became the most important cost, along with insurance, loading and unloading, agency, and port costs.

The impact of industrialization on shipping was also tangible in maritime technology, trade routes, and the labour force. Greek shipowners in the nineteenth century operated with two-masted sailing ships, mostly built in Greece. By the turn of the twentieth century this had shifted to many more steel built, screw driven cargo steamers from Britain, able to sustain economies of scale in the volume of transported cargo. This technical development widened the trade routes of Greek ships to northern Europe and to the Atlantic Ocean, and thus, in turn, the level of integration of Greek shipping firms in international markets. The ship operation network, as seen in the case of the *Georgios M. Embiricos*, expanding from India to the South Atlantic up to North America and back to Europe, is another very illustrative aspect of this integration at the world scale, attained by Greek shipping firms. In labour, the industrialization of the ship more than doubled the size of the crew on Greek tramp vessels, while at the same time decreased considerably the importance of labour as a cost factor. Wages were remarkably stable throughout the examined period, and only during the war years doubled along with profits and freight rates. The most significant salary upgrade from sailing ships to steamers was that of the captain, who, along with the first engineer, created a large gap in terms of wages and hierarchy with the rest of the crew. Recruitment maintained its principal characteristics, as in the age of sail, and most men came from a local or regional labour force, whereas mobility was also of limited scale, and only between the same sub group of the crew (upper, middle, or lower).

The profitability of the examined cases of Greek ships, both in the sailing and in the steamship period, explains the viability and continuity of the Greek shipping sector. The Kaloyannis firm operated for almost half a century and S.G. Embiricos for almost a century, while even passive shareholders in the steam period received respectable returns. Moreover, the massive loss of

Greek steamers in the First World War by German submarines did not stop many Greek shipowners from continuing in the industry.[58] In fact, from a fleet of eight steamers of the S.G. Embiricos company before the First World War, only one survived, one was sold, one was stranded, and the rest, along with the *Georgios M. Embiricos*, were sunk by German submarines. It took a few years from 1920 to rebuild a fleet of six more steamers and three more in the 1930s, while most of the ships took the same names as those lost in the First World War. The same fate befell the *Leonardos G. Goulandris*, only Goulandris Brothers needed ten more years to replace her, with two ships, one sold soon after and one kept up to 1939, all indicating the difference in the capital base and strategy, size, and development between the firms.[59]

This study of the operation of Greek ships is an exploration into the anatomy of the shipping business, in the structure, function, and performance of the shipping firm. It has demonstrated how Greek shipowners evolved in the transitional period from sail to steam from different starting points and traditions, and the different strategies and business methods they employed to succeed. It also illustrates the world of other actors involved in ship operation, namely the partners, shareholders, business collaborators, and maritime workers of all ranks. All these seafaring lives contributed to the changes in Greek shipping in the transition from sail to steam.

58 Based on https://uboat.net/wwi/ships_hit/search.php (accessed 6 October 2020), 272 Greek sailing ships and steamers were sunk by German U-boats during the First World War.

59 http://www.sunderlandships.com/view.php?year_built=&builder=&ref=103592&vessel=EUGENIE+S.+EMBIRICOS (accessed 6 October 2020); Bistis, Ο Ατμήρης εμπορικός στόλος, 53, 59.