

WMU Studies in Maritime Affairs 4

I.D. Visvikis
P.M. Panayides *Editors*

Shipping Operations Management

WMU  **WORLD
MARITIME
UNIVERSITY**

 Springer

WMU Studies in Maritime Affairs

Volume 4

Series editors

Maximo Q. Mejia Jr.

Aykut I. Ölçer

Jens-Uwe Schröder-Hinrichs

More information about this series at <http://www.springer.com/series/11556>

I.D. Visvikis • P.M. Panayides
Editors

Shipping Operations Management

 Springer

Editors

I.D. Visvikis
World Maritime University
Malmö, Sweden

P.M. Panayides
Department of Commerce,
Finance and Shipping
Cyprus University of Technology
Lemesos, Cyprus

ISSN 2196-8772

ISSN 2196-8780 (electronic)

WMU Studies in Maritime Affairs

ISBN 978-3-319-62364-1

ISBN 978-3-319-62365-8 (eBook)

DOI 10.1007/978-3-319-62365-8

Library of Congress Control Number: 2017954320

© Springer International Publishing AG 2017

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Printed on acid-free paper

This Springer imprint is published by Springer Nature

The registered company is Springer International Publishing AG

The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Foreword

As the President of the World Maritime University (WMU), I am pleased to introduce the fourth volume of the WMU Studies in Maritime Affairs book series published by Springer, titled *Shipping Operations Management*. The series was launched in 2013 to encourage academics and practitioners from all areas of specialisation across the field of maritime affairs to contribute to the expansion of knowledge through publications of the highest quality and market relevance. Previous books in the series include *Farthing on International Shipping* (2013), *Piracy at Sea* (2013) and *Maritime Women: Global Leadership* (2015). With this book series, the WMU aims to further develop expertise in maritime education and training, maritime energy management, maritime law and policy, maritime safety and environmental administration, ocean sustainability governance and management, port management, and shipping management and logistics.

WMU is a postgraduate maritime university established by the International Maritime Organization (IMO), a specialised agency of the United Nations, which aims to further enhance the objectives and goals of IMO and IMO member States around the world through education, research and capacity building to ensure safe, secure and efficient shipping on clean oceans. WMU's mission is to provide the best possible education and research facilities for postgraduate studies, professional training and capacity building for a sustainable maritime industry and related oceans fields. We facilitate harmonisation, uniform interpretations and effective implementation of maritime conventions and related instruments.

Shipping Operations Management comes as a response to the market needs to provide a comprehensive coverage of all functions of the modern management of shipping operations. It aspires to become a one-stop read for all interested parties from both the maritime business sector and academia. The chapters are written by world-renowned academics and practitioners, all experts in their subject area. The book covers areas such as fundamentals of shipping management; organisation behavior in shipping; commercial, crew and technical operations management; the MLC 2006 from the perspective of legal jurisdiction and port state control; managing financial resources in shipping; maritime energy management; safety and

security in shipping operations; nationality of ships and marine insurance; and ocean governance and sustainability.

I invite you to read this book, and I am sure that you will find it relevant and responsive to your needs. At WMU, we have a very strong commitment to research at the highest level of academic and professional standards.

Malmö, Sweden

Cleopatra Doumbia-Henry

Preface

The management of shipping operations is a fundamental activity for shipowning, ship operating and third party ship management companies and represents an area where companies constantly seek and assign relevant responsibilities to qualified and knowledgeable personnel. It is an area that requires integrative knowledge that spans across disciplines and needs varied experiences. It requires shipping operations personnel to be well versed with aspects of management, economics, engineering, technology and law, including information and communication systems. It requires the ability to identify and neutralise threats and to manage risks and to make decisions that will optimise costs and contribute to performance improvements. Despite the above obvious needs, there is no book or edited volume that has attempted to reconcile and compile a comprehensive body of knowledge in a coherent, structured and systematic approach on the subject matter. This edited volume aims to address this fundamental gap in the extant literature and can be used as a reference point for maritime companies and organisations, and also serve as a teaching and reference textbook in both undergraduate and postgraduate maritime-related programmes of study.

Chapter 1 by Panayides provides a high-level overview of the fundamental principles of ship management, which entails the various activities and operations necessary to manage a ship, as well as a description of company organisation and structures, a review of ship management services and reference to contractual arrangements between ship managers and owners. Key topics in this context include ship registration and flagging, the regulatory environment and issues of environmental performance management, energy efficiency and slow steaming, as well as managing and measuring ship management performance through the use of key performance indicators.

In Chap. 2, Pastra, Gkliatis and Koufopoulos introduce concepts of organisational behavior in shipping, focusing on issues of organisational structure and placing particular emphasis on the top management and governance of maritime organisations. In the contemporary globalised and turbulent maritime industry environment, overseeing the operations and decision-making of top leaders of

shipping companies is critical, especially with the current and prolonged global financial crisis in place. It is therefore important to have a thorough understanding of organisational processes and routines that should be continuously reviewed, redesigned and improved. In this context, the discussion describes the challenges and complexities that company executives have to face when dealing with processes and routines. The basic processes and routines that can be found in a shipping company are presented in addition to how these processes can lead to organisational change. The chapter also advocates the need for shipping companies to change and transform over time, as a means of ensuring longevity and sustainability.

The success of a shipowning organisation depends on the ability of the business to identify, negotiate and execute successful chartering options. The effective hiring of the ship or space on the ship represents the main revenue-earning stream for the shipping company, and the successful negotiation of the hire terms and efficient performance of the fixture will lead to profitability and competitiveness. In Chap. 3, Assimenos discusses in practical terms and in detail the management of commercial operations, including the types of chartering arrangements that can be effected, the chartering negotiation process, issues of payment of freight and hire, laytime, demurrage and despatch, as well as voyage estimation for dry cargo and tanker ships. The chapter also addresses cargo and charter party claims, as well as bunkering operations rendering a comprehensive treatment of the main aspects pertaining to the profit and costs of ships.

Crew management is central to shipping operations, and in Chap. 4 Anastasiou provides a comprehensive and thorough review of crew management operations. The analysis identifies the intricacies and multidimensional nature of crew management operations, referring also to the interface with shipping operations. The chapter achieves the comprehensive understanding of crew management operations and at the same time provides a valuable review of best practices. Specific topics include the identification and recruitment of seagoing labour in the context of economic issues such as the achievement of economies of scale and the all-important issues of training and management of crew performance. In addition, the author provides a comprehensive discussion of the role of marine academies and their relationship with shipping companies.

Technical operations management is one of the most demanding and complex areas of ship management. These characteristics arise from the necessity to integrate ship, shore and other, external to the company, bodies and organisations while operating in the context of strict national and international laws and regulations. Furnival and Crispe in Chap. 5 provide a discussion of the organisational and managerial aspects of technical operations management. The topics include the organisational structure of the team needed to manage the fleet, the relationships with other departments within the organisation and the main areas of concern related to the actual management of the ships, including client relationships, running the ships, emergency response, maintenance and managing expenditure. The chapter concludes with some of the challenges expected to play a role within technical operations management in future years.

In Chap. 6, Doumbia-Henry examines the manner in which the Maritime Labour Convention 2006 (MLC 2006) addresses the legal jurisdiction of the State for foreign ships entering its ports (port State) or legal venue with respect to seafarers' rights. The MLC 2006 is currently ratified by 82 member States of the ILO, representing 91% of the world gross tonnage of ships. The MLC 2006 came about from the consolidation of almost all maritime labour Conventions and Recommendations adopted by the ILO, provides shipowners and governments with a level-playing field and is regarded to be the fourth pillar of the international maritime regulatory regime. The MLC 2006 also further developed the concept of flag State inspection with a certification system to support labour compliance and significantly strengthened port State control procedures for compliance with working and living conditions. It is now an important instrument for international labour law that can ensure that seafarers' rights are protected and that they can enjoy the decent work benefits provided for under the Convention. Still the author believes that the implementation of the Convention and its envisaged provisions need to be closely observed and monitored, and its effectiveness in ensuring the rights of seafarers still needs to be assessed taking into account the stance of judicial decisions.

The cyclical nature of the shipping industry and the volatility of freight rates due to the underlying market characteristics of the demand for commodities and the supply of ships have a direct effect on the asset value of ships. The purchase of ships requires very high capital investments, which also require considerable funding for management and operations. As a result of the industry's cyclical and capital-intensive nature, it is fundamental for the industry's participants and capital providers to determine if the timing is appropriate for investments in shipping. In Chap. 7, Kavussanos, Visvikis and Alexopoulos explain and analyse the different sources of shipping finance in the context of the challenges in the sector. They also explain the techniques and strategies that can be employed to manage business risks in shipping.

Maritime energy management is a multidimensional concept with several key stakeholders, be it shipowners and cargo traders, governments and regulators, as well as the general public. The management of ship-related energy consumption is of vital importance to shipping companies from several perspectives, not least as a means of reducing the cost of ship operation itself but also to comply with the increasingly stringent and varied international regulations set by the IMO and other bodies responsible for setting for national and international energy-related regulations. In Chap. 8, Ölçer, Baumler, Ballini and Kitada address a number of issues with respect to energy management, including key international regulations and their main requirements such as MARPOL and relevant regulations for sea and air emissions. In addition, the chapter addresses issues of energy-efficient ship operations highlighting examples of corporate policies, as well as port energy management, by discussing relevant plans.

It has been mentioned that shipping is a risky business, and a major risk that arises is associated with the physical risk on board ships due to substandard and unsafe practices and operations and also due to security reasons emanating from

external actions by third parties such as terrorists and pirates. In this context, Dalaklis in Chap. 9 notes that considerable strides have been made to improve safety and security on board ships, especially with the advent of technology and with the development of relevant international regulations such as the SOLAS convention. The author discusses the specific regulations and their provisions, focusing on the pivotal role of the SOLAS convention and indicating how they address the challenges in the context of the dangerous maritime environment within which ships operate. The author concludes that it is only with the continuous study and introduction of new and updated regulations that such risks will be effectively managed.

One of the great challenges of being in the shipping business that may also lead to high rewards is the inherent risk associated with operating in this business, particularly physical as well as economic risks. The manifestation of physical risk depends on many factors, like the condition, maintenance and safe navigation of the ship; the encounter of adverse weather conditions; the competency of the seafarers, as well as that of the onshore personnel; and the prevailing market conditions, which dictate the mode of operation and exploitation of the ship. Regardless of all efforts to reduce shipping-related risks, some risks will remain. The risk, which remains, can be transferred to another party, either by transferring the activity to a specialist (e.g., subcontracting) or by transferring the financial consequences. It is the last option, namely transfer of risk by insurance, that Theocharidis and Donner examine in Chap. 10 in the light of the shipowner's unfettered right to elect registry for his ship. The analysis concludes that while there are situations where the law imposes a requirement to have insurance to cover certain liabilities, the choice of registry is not a direct criterion for obtaining insurance but may be, and probably would be, a criterion for assessing the risk and setting the premium. Marine insurance is a business, where decisions to request and offer insurance cover are business oriented and based, primarily, on business criteria and, only secondarily, on reputation criteria.

In Chap. 11, Hildebrand and Bellefontaine examine an area of maritime management that is of fundamental interest to all stakeholders of shipping operations, that of sustainability of the oceans. The key question addressed is whether the existing ocean governance and management laws, policies and institutions are sufficient to face the challenge of maintaining and indeed restoring the natural ocean capital. The authors discuss in detail the issues faced in ocean governance and sustainability and conclude that after several decades of concerted and cooperative effort by the international community, much knowledge has been generated, various issues have been addressed, promising governance and management frameworks and paradigms have been put forward and a plethora of best practices have been identified and disseminated. However, it is also acknowledged that the pace at which governance and management of the ocean is proceeding does not match the pace of degradation of the marine environment and its resources. Shipping will certainly remain a prominent component of the ocean economy, but it must continue to grow in and adapt to a more crowded and competitive ocean space, a worsening ocean environment with greatly diminished capacity to support multiple

and growing social and economic needs and a more integrated ocean governance regime with all of the legal, jurisdictional, social and ecological challenges this implies. The shipping sector needs to think beyond its sectoral focus and embrace its place in an evolving ocean space and cooperative ocean governance regime.

Finally, we would like to sincerely thank the following chapter reviewers (in alphabetical order) for their valuable support and efforts: Assoc. Prof. Michele Acciario (Kühne Logistics University), Bill Box (Intertanko), Prof. Dr. Wolfgang Drobetz (University of Hamburg), Prof. Ronan Long (World Maritime University), Assoc. Prof. Michael Manuel (World Maritime University), Prof. Moira L McConnell (Dalhousie University), Assoc. Prof. Theodora Nikaki (Swansea University), Dr. Maria Progoulaki (University of the Aegean and The American College of Greece), Prof. Dr. Orestis Schinas (HSBA Hamburg School of Business Administration), Prof. Ernestos Tzannatos (University of Piraeus) and Dr. Malcolm Willingale (Prospect Maritime).

Malmö, Sweden
Lemesos, Cyprus
May 2017

I.D. Visvikis
P.M. Panayides

Contents

1	Fundamentals of Ship Management	1
	P.M. Panayides	
2	Organisational Behaviour in Shipping	25
	Aspasia Pastra, Ioannis Gkliatis, and Dimitrios N. Koufopoulos	
3	Commercial Operations Management	47
	Nicolas Assimenos	
4	Crew Operations Management	73
	Julia Anastasiou	
5	Technical Operations Management	99
	David Furnival and Jonathan Crispe	
6	The Maritime Labour Convention, 2006, Legal Jurisdiction and Port State Control	129
	Cleopatra Doumbia-Henry	
7	Managing Financial Resources in Shipping	153
	Manolis G. Kavussanos, I.D. Visvikis, and Ioannis Alexopoulos	
8	Maritime Energy Management	177
	Aykut Ölçer, Raphael Baumler, Fabio Ballini, and Momoko Kitada	
9	Safety and Security in Shipping Operations	197
	Dimitrios Dalaklis	
10	The Relationship Between Nationality of Ships, “Genuine Link,” and Marine Insurance	215
	George Theocharidis and Patrick Donner	
11	Ocean Governance and Sustainability	231
	Lawrence P. Hildebrand and Neil A. Bellefontaine	

Contributors

Ioannis Alexopoulos has more than 15 years of professional experience in shipping, banking and maritime finance. He is Director at the Eurofin Group; a ship-financing boutique with offices in London, Athens and Singapore. He is responsible for the Group's ship financing operations in Greece and is a key part of the Eurofin team, which acts as a Consultant to KfW IPEX-Bank for its Greek debt shipping portfolio. He has also worked for Laiki Bank in Cyprus, Golden Union Shipping Co. and Carriers Chartering S.A. in Piraeus and Angus Graham & Partners in London. He is a visiting lecturer on shipping finance and maritime economics at the ALBA Graduate Business School in Athens and at the Henley Business School of Reading University. He is also a consultant on shipping finance to the World Maritime University (WMU), in Malmo, Sweden and a co-author of shipping finance books. He holds an MSc in Shipping, Trade and Finance from Cass Business School, in London and a BSc in Economics and Business Economics from Southampton University.

Julia Anastasiou has been an active member of the shipping community for the past 20 years. She has gained experience in the ship management sector holding influential roles and partaking as a member of various shipping organizations. Being a Chartered Ship Broker by profession, today Julia holds a global position as Crew Director with the OSM Maritime Group. She effectively drives performance, manages the business and facilitates sustainable profitability and growth. She has overseen several changes since her undertaking of this role in 2014 and continues to enhance her performance through further education, innovative thinking, leadership and networking. Julia was born in Toronto, Canada and is a permanent resident of Cyprus where she resides with her husband and two children.

Nicolas Assimenos is a holder of an M.Sc. in International Transport from the University of Wales, Cardiff, a B.Sc. in Economics from the University of Salford, a Diploma in Shipmanagement and a Diploma in Shipping Finance. He has worked in MCL Metz Container Lines in the Logistics Department undertaking the responsibility of the transshipment and he has worked at Columbia Shipmanagement at the

Insurance, Claims and Documentation department from 1999 until 2005. In addition, he has worked at UCT United Chemical Transport in Hamburg, in the Chartering and Operations Department between 2005 and 2006. Furthermore, he has worked at Interorient Navigation as Head of Operations/Chartering Broker between the years 2007 and 2013 and, he currently holds the position of the Operations Manager & Business Development Manager at Uniteam Marine since 2013. He also has extensive experience in lecturing as he has worked as a lecturer at Frederick Institute of Technology for topics such as Maritime Economics and the Economics of Sea Transport and International Trade. Moreover, he has been working as a lecturer at Cyprus University of Technology since 2012 as a scientific expert for tutoring in the subjects of Chartering, Marine Insurance and Shipping Operations & Management. He is a Fellow member of the Institute of Chartered Shipbrokers and also acted as a tutor at the Institute of Chartered Shipbrokers, Cyprus branch. Currently, he is undertaking his Doctorate in Professional Studies at Middlesex University, London.

Fabio Ballini has Economic and Maritime Transportation background. He obtained his MSc in Maritime Economics and Transport at the Faculty of Economics in Genova (Italy) and holds a Ph.D. Electrical Engineering, awarded a European Ph.D. label, from the University of Genova (Italy), Dept. of Naval, Electrical, Electronic and Telecommunication Engineering (DITEN). Dr. Fabio Ballini previously held the position of Adjunct Professor and Assistant Professor at the Faculty of Maritime Economy in Genova (Italy) where he taught academic courses on topics related to Maritime Economy, including Social Cost-Benefit Analysis, Gaseous Ship Emissions, Emission Evaluation Models, Intellectual Property Rights in Shipbuilding. At WMU, Dr Fabio Ballini is currently a Lecturer in the Maritime Energy Management specialization and is a member of the Maritime Energy Research Group (MarEner) dealing with research topics related to Port Energy Management Planning, Gaseous Emissions from Ships in Harbors, Externality Cost in Transportation, Externality Modeling, Clean-Tech Solutions and Energy Audit Systems in Port. His recent research areas of interest at the WMU in Malmö have focused on Circular Economy in relation to ports and renewable energy and alternative fuels as a marine fuel. Dr. Fabio Ballini has extensive experience in developing research projects and project proposals through lifecycle management. Dr Ballini was involved in numerous EU funded projects: TEN T Programme (TrainMos, Mona Lisa 2.0 projects), ENPI CBC MED Programme (CUSTOM MED project), CIPS Programme (CYSM Project), Europeaid tender (IPSEA project), Marco Polo Programme (OTMW-N project), Interreg IVB Programme (SAIL project), Interreg Baltic Sea Region Programme (GO LNG project), Interreg South Baltic Programme (SBOIL Project). He has published results of his research in leading, internationally peer-reviewed journals such as: Transportation Research Part D Journal and Research in Transportation Business & Management: Energy Efficiency in Maritime Logistics Chains Journal.

Raphael Baumler, primarily educated as a dual officer, spent 21 years in a seafaring career. He ended this occupation as Master on a large container ship. In addition, he completed his experience with a Ph.D. in Risk Management in 2009 and joined WMU in 2010. Since, he has been actively involved in numerous IMO projects as contributor, subject matter expert and project manager. His work mostly relates to Ballast Water Management Convention, MARPOL Annex VI and shiprecycling.

Neil Bellefontaine has held the position of Vice President Academic at the World Maritime University since 2011, and previously held the Canadian Chair in Marine Environmental Management from 2006 to 2012. Prof. Bellefontaine had professional knowledge and research experience in maritime administration, fisheries, aquaculture, and coastal and oceans management fields. He has studied resource economics (B.Com Hons Economics), marine management (MMM), and executive management (EXADM). As Vice President Academic Prof. Bellefontaine maintains active collaborative relationships with governmental leaders, universities, and maritime industry and ocean stakeholders. Prior to WMU, Prof. Bellefontaine was a senior executive (Assistant Deputy Minister level) employed with the Canadian Fisheries and Oceans department for 33 years. In 1998, Prof. Bellefontaine was presented with the Outstanding Public Service Award by the Prime Minister of Canada. From 1993 to 2006, he served as the Regional Director General for the Maritimes Region of Canada, where he was responsible for the administration of science, oceans and habitat, fisheries and aquaculture, small craft harbours, corporate programs, and including the Canadian Coast Guard.

Jonathan Crispe is a Corporate Expert—Technical at Bernhard Schulte Shipmanagement (BSM). Following a seagoing career with BP Shipping and then Dorchester Maritime, Jonathan joined BSM Bermuda (formally Atlantic Marine) in 1989 as Technical Superintendent, before transferring to BSM Isle of Man (formally Dorchester Maritime), in 1991. In 2000, he was promoted to Technical Manager, responsible for a fleet of mainly gas and product/chemical carriers. Additional projects included specification development for new buildings, contract negotiation and plan approval, together with life extension of LNG, LPG, chemical, product and crude carriers. In 2005, he became Operations Manager, and in 2008 Technical Director for the fleet which included a number of LNG carriers. In 2012, following the BSM merger, he was promoted to Corporate Expert—Technical for the group. Responsibilities include oversight of technical aspects of ship management, development of BSM's in-house Planned Maintenance System, new business development, and new building project support.

Dimitrios Dalaklis joined WMU in the summer of 2014, upon completion of a 26 years distinguished career with the Hellenic Navy. His expertise revolves around the extended Maritime Education and Training (MET) domain and especially the conduct of navigation (regulatory framework, techniques-associated best practices and related equipment), as well as maritime safety and security issues. He has

performed, coordinated and supervised many series of training involving the use of simulators, as well as on-board practical workout programs. The same applies to various educational and/or professional development activities. Dr. Dalaklis, an Associate Fellow of the Nautical Institute (NI) and a Member of the International Association of Maritime Economists (IAME), is holding a Bachelor in Maritime Sciences from the Hellenic Naval Academy. His postgraduate studies took place in the Naval Postgraduate School of the United States, during which he was awarded with two different Masters' degrees (MSc in Information Technology Management, with distinction and Defense Analysis). He then conducted his PhD research at the University of the Aegean, Department of Shipping, Trade and Transport. He is the author/co-author of many books articles and studies in both the Greek and English language.

Patrick Donner received an LLM from the University of Turku and having qualified for the judiciary served on the bench for 5 years. He worked for 14 years in executive positions in shipping companies in Finland after which he had his own law and management consultancy firm for a few years. During all this time, he taught maritime law (part-time) at the Maritime Academy of Åland and also held numerous non-executive positions on boards of directors of shipping and insurance companies as well as elected public office at local level. Patrick Donner joined the World Maritime University (WMU) as Associate Professor in Shipping Management in 1995 and served as Associate Academic Dean from 2006 until February 2017. Mr. Donner also lectures in WMU's MSc programme in International Transport and Logistics at Shanghai Maritime University, is Programme Co-ordinator of the Postgraduate Diploma course in Marine Insurance and is a visiting Associate Professor in the Maritime MSc and MA/LLM programmes of Frederick University in Cyprus.

Cleopatra Doumbia-Henry (LL.B, LL.M (2), Ph.D. International Law) is the President of the World Maritime University based in Malmo, Sweden. Prior to joining the University, she served as Director, International Labour Standards Department, International Labour Organization (ILO), Geneva, Switzerland, where she worked for more than 29 years in senior management positions and as a lawyer. Prior to joining the ILO, she worked for Iran-US Claims Tribunal in The Hague, The Netherlands and as lecturer at the Faculty of Law, University of the West Indies, Barbados. She is also a Barrister at Law and Solicitor. Dr. Doumbia-Henry was responsible for managing the entire portfolio of almost 400 international labour standards, including the ILO Maritime Labour Convention, 2006 as well as for the management of all the supervisory bodies of the ILO. She spearheaded the design of a Standards Review Mechanism for ILO to ensure that international labour standards remained up to date and reflected the changing patterns of the world of work. She has published extensively on a wide range of international law subjects, including international labour standards, international maritime law, international trade law and international environmental law.

David Furnival is a Chief Operating Officer at Bernhard Schulte Shipmanagement (BSM). Mr. Furnival joined BSM Isle of Man in 1998 as Technical Manager. In 2005, he was promoted to Managing Director and in 2012 was appointed to the position of Chief Operating Officer at BSM. Prior to this, Mr. Furnival worked with C.F. Ahrenkiel, Cyprus for 5 years as Technical Manager. His previous experience includes 12 years at sea, reaching the rank of Chief Engineer on a variety of tankers. Mr. Furnival is President of the Society of International Gas Tanker and Terminal Operators (SIGTTO), a Member of the Institute of Marine Engineering, Science and Technology (IMarEST), and a former Chairman of the Isle of Man Shipping Association.

Ioannis Gkliatis holds a BSc in Business Administration from La Verne University and received an MSc degree from Brunel University in HR and ER. His doctoral thesis—also from Brunel University—is in the area of corporate governance and is focusing on board roles and the impact of the external environment. After a few years of teaching experience in UK institutions, he is currently a Senior Lecturer in Strategic Management at University of Hertfordshire. Moreover, he is a Senior Research Associate at the Hellenic Observatory of Corporate Governance. Also, he is a director in Gnosis Management Consultants Ltd. that specializes on strategy development, executive education and corporate governance aspects. His primary research interest is on corporate governance, boards of directors, strategy, planning, decision making.

Lawrence P. Hildebrand is Professor and Canadian Chair in Marine Environmental Protection at the World Maritime University in Malmö, Sweden. He heads the University's MSc. specialization in Ocean Sustainability, Governance and Management and is part of a team developing a new Global Ocean Institute at WMU in partnership with the Nippon Foundation. Dr. Hildebrand joined WMU in 2013 from Halifax, Nova Scotia on Canada's east coast where he served for 35 years in a variety of leadership capacities in government and non-government organizations directly related to integrated coastal and ocean governance. Dr. Hildebrand is also an Adjunct Professor of Marine Affairs at Dalhousie University and Visiting Professor at universities in the U.S., Iceland, Uruguay and the U.K. Dr. Hildebrand has also served as evaluation and policy-development consultant and trainer to the United Nations Environment Programme, Convention on Biological Diversity and UN Development Programme in East Asia, Latin America and the Caribbean. He is a Governor of the International Ocean Institute and Senior Research Fellow at IOI-Canada, and an Editorial Board member of the international journal *Coastal Management*. He is a frequently invited keynote speaker at international conferences on ocean governance and management and is the recipient of the H.B. Nicholls Award for Leadership in Coastal Zone Management in Canada, the Canadian Public Service Award of Excellence, and the Distinguished Service Award with the US-Canada Gulf of Maine Council on the Marine Environment. Dr. Hildebrand has degrees in marine biology (B.Sc. Hons) and environmental

studies (MES) from Dalhousie University and a PhD. in coastal and ocean governance from Cardiff University in Wales.

Manolis G. Kavussanos is Professor at the Athens University of Economics and Business (AUEB), Greece. He is the Director of the MSc program in International Shipping, Finance and Management and of the Laboratory for Finance since their inception, member of the steering committees of the MSc program in Accounting and Finance, of the Athens MBA program, and for 5 years the Director of the MSc and PhD programs in Accounting and Finance at AUEB. He holds a BSc and MSc (Economics) from University of London and PhD (Applied Economics) from City University Cass Business School (Cass), London. He launched and directed, until he joined AUEB, the MSc in Trade, Transport and Finance at Cass. He has held various posts as professor of finance and shipping in universities in more than eight countries around the globe, such as UK, France, The Netherlands, Belgium, Italy, Singapore, China, Greece and Cyprus. He has provided consultancy and executive training services in finance and shipping to private companies and public sector national and international organizations, has been a member of international committees for the evaluation of academic programs in tertiary academic institutions, for the award of prestigious prizes and for research funding. Professor Kavussanos has written extensively in the areas of finance, shipping and applied economics, and is the author of numerous academic papers published in top international refereed journals, in conference proceedings and books. He is member of the editorial board on a number of these journals. His work has been presented in international conferences and professional meetings around the world, gaining awards for its quality, financed by both public (e.g. European Community) and private sector organizations, companies and foundations (e.g. Propondis Foundation) and cited extensively by other researchers in the area. Since 1992, he has worked in developing the area of risk analysis and management in shipping and is the co-author of three books in this area.

Momoko Kitada is a former seafarer and her research interests lie in gender issues in shipping, in particular, women seafarers and seafarers' families in terms of identities and welfare issues. She teaches subjects in Maritime Education and Training (MET), including cultural issues, knowledge management, assessment methodology, and contemporary labour issues. Momoko's research expands to the human element and social aspects in energy management. She is engaged internationally as an Associate Researcher at the Seafarers International Research Centre (SIRC)—Cardiff University, as a Guest Lecturer at Open University, Japan, and as an Adjunct Professor at the AMET University, India. Momoko joined WMU in 2011 and serves as an Assistant Professor as well as in the Secretariat of the WMU Women's Association (WMUWA). She leads WMU's collaboration efforts with the IMO in terms of women's integration in the maritime sector and assists WMUWA in connecting with other IMO regional support networks. Her previous work experience includes positions within both the private and public sectors, such as several major Japanese companies and organizations of trading, manufacturing,

banking, social welfare and international aid (1994–2003); voluntary work for the Department of Conservation of New Zealand (1998); national leader of the 13th “Ship for World Youth” programme (2000); internship at the Japanese Shipowners’ Association, London (2003); research assistant for the IAMU research project (2003–2004); research fellow at SIRC—Cardiff University; writer for the monthly shipping magazine “Kaiun” (2007–2009); visiting lecturer at Kobe University, Japan (2007–2009) and at Chalmers University of Technology, Sweden (2009).

Dimitrios Koufopoulos holds a degree in Business Administration from the Athens University of Business and Economics (former ASOEE) and an MBA and PhD degree from Cardiff University. He is the Director of the MBA programme at Brunel Business School and Senior Lecturer in International Management and Strategy. He has taught as visiting Lecturer in both British and American institutions and currently serves as an Adjunct Faculty at Universitas 21, the Hellenic Open University, Laureate-Liverpool and Laureate-Roehampton. He is a Fellow of the Institute of Management Consultants, Member of the Chartered Institute of Securities and Investments, Member of the Chartered Management Institute and Academic Member of the European Corporate Governance Institute. He is also the Founder and Scientific Director of the Hellenic Observatory of Corporate Governance, which since 2007 produces regular reports on issues relating to Corporate Governance in Greece.

Aykut I. Ölçer is a naval architect and marine engineer holding the position of Professor at the World Maritime University (WMU), Malmö, Sweden. In his Ph.D. thesis, he developed a novel methodology utilizing multiple attributive group decision-making and fuzzy set theories with the applications to Ship Design/Production area. Prior to joining WMU, he worked at Newcastle University (England), University of Strathclyde (Scotland) and Istanbul Technical University (Turkey) within the fields of Naval Architecture and Marine Engineering. He played an important role in Newcastle University’s first international branch in Singapore to help the University achieving its objectives in teaching/learning and research activities in the undergraduate programs of Marine Technology. For many years, he has conducted research independently/jointly and collaborated with other researchers, academics and students all over the world, in particular from Europe and Asia. Dr. Ölçer was involved in numerous EU funded FP5, FP6 and FP7 projects including OPTIPOD (Optimal Design and Implementation of Azimuthing PODS for the Safe and Efficient Propulsion of Ships), FASTPOD (Fast Ship Applications for Pod Drives), COMPASS (A Rational Approach for Reduction of Motion Sickness and Improvement of Passenger Comfort and Safety in Sea Transportation), COMAND (Integrated Crisis and Operation Management Decision Support System for Passenger Ships), SAFEDOR (Design, Operation and Regulation for Safety of Ships), IMPROVE (Design of improved and competitive products using an integrated decision support system for ship production and operation) and TARGETS (Targeted Advanced Research for Global Efficiency of Transportation

Shipping). He currently leads the WMU Maritime Energy Research Group (<http://wmu.se/research>) that has secured funding from the EU and IAMU for several projects including wind assisted ship propulsion (SAIL project, EU-Interreg IVB), improving energy efficiency of ships through optimization of ship operations (IAMU), and development of vocational education for LNG as a marine fuel (OTMW-N project, EU-Marco Polo). His recent areas of research are: Maritime energy management and energy efficiency, Renewable energy and alternative fuels (LNG in particular), Real-time decision support systems for energy efficient ship operations, Climate change impact on port infrastructure and its adaptation, Lean, energy efficient and green ports, Life cycle cost/environment impact models of green solutions for ships, ports and shipyards, Decision making for trade-off situations of cleaner seaborne transportation. He has published results of his research in leading, internationally peer-reviewed journals such as European Journal of Operational Research, Quality and Reliability Engineering International, Computers and OR, and Applied Soft Computing.

P.M. Panayides is Professor in Shipping and Maritime Economics at the Cyprus University of Technology. Prof. Panayides has 21 years of professional experience and has held appointments or research collaborations among at others The University of Plymouth, The University of Reading, The Hong Kong Polytechnic University and the National University of Singapore. Prof. Panayides has authored or edited five books in *Chartering*, *Ship Management* and *Maritime Logistics* and is also authoring the book *Shipping Performance Management* as well as editing the *Handbook of Maritime Management*. He has consulted on the development of key performance indicators and performance management in shipping organizations and published several scientific journal papers in esteemed academic journals. Prof. Panayides serves on the editorial board of several academic journals, and has served as Vice President of the Board of Directors of the Cyprus Ports Authority and as member of the Council of the International Association of Maritime Economists.

Aspasia Pastra holds a B.Sc. degree in Public Administration, specializing in economics, from Panteion University of Social and Political Sciences in Athens and an MBA from Cardiff University. She was granted a scholarship in memory of the ship-owner George P. Livanos for the World Maritime University in Sweden and received an MSc in Maritime Administration. She is a PhD candidate at Brunel University in the area of corporate governance and board of directors. She has extensive experience in shipping as she worked for many years in shipping companies either as an Internal Financial Auditor or as an economist. Currently, she is a research analyst at the Hellenic Observatory of Corporate Governance, which produces regular reports on issues relating to Corporate Governance in Greece since 2007.

George Theocharidis, before joining WMU, was responsible for the legal support of the Shipping & International Division of a large Greek bank in the areas of Shipping Litigation, Ship Finance, Corporate & International Disputes. Prior to that, he acted as in-house and external legal counsel for Greek interest ship-owning

companies. He has been invited in many countries (Cyprus, Israel) to give lectures on shipping matters. He has also been a speaker in various international conferences (Greece, The Netherlands). In 2004, he was accepted as supporting member in the London Maritime Association of Arbitrators (LMAA). He is a Member of the Piraeus Law Bar and a qualified advocate before Areios Pagos (Supreme Court), practicing extensively in the special field of maritime law. His research interests concentrate on Carriage of Goods by Sea, Marine Insurance, Conflict of Laws. He is the author of the books “Tort Liability of the Sea Carrier under Hague-Visby Rules” (2000), “The Co-ownership on Vessel as legal form for the exercise of maritime commercial activity” (2008) and co-author of “Maritime Law” (2015). He has also published several articles (“Mechanisms of Protection From Non-Contractual Modes of Recovery in Sea Carriage—A Comparison Between Common Law and Civil Law Systems”, “Relationship between forum shopping and flag in satisfaction of security rights on a ship”, “Jurisdiction for Provisional Relief under the Brussels Convention in Maritime Context” et al.) His published research work in international referred periodicals (J.Mar.L&C., R.H.D.I.) has received numerous citations from jurisprudence and theory (Heidelberg Report). He holds an LL.M. degree from the University of Cambridge (UK) and a Ph.D. from Aristotle University (Greece).

I.D. Visvikis is a Professor of Shipping Finance and Risk Management and the Director of Executive Education and Professional Development at World Maritime University (WMU) in Malmö (Sweden), founded by the International Maritime Organization (IMO), a specialized agency of the United Nations. He is a Visiting Professor at ICMA Centre—Henley Business School of the University of Reading, UK. He is also an Associate Editor for the Transportation Research Part E: Logistics and Transportation Review journal. He has taught at several universities around the world, while he has an extensive international experience in consultancy and executive education. His research work has been published in international refereed scientific journals, books and magazines, and has received numerous citations. He is the co-author of the *Derivatives and Risk Management in Shipping* (2006), the co-editor of the *Theory and Practice of Shipping Freight Derivatives* (2011), and the co-editor of the *The International Handbook of Shipping Finance* (2016). He has extensively presented his work in international academic and business conferences held in USA, Europe and Asia. He serves as an editorial board member of several scientific journals, while he has served as member of conference steering committees, and reviewer for several scientific journals, while he is a Council Member of the International Association of Maritime Economists (IAME). He holds a Degree in Business Administration from University of Aegean (Greece), a Masters in Science in International Financial Markets from University of Southampton, a Masters in Science in International Shipping from University of Plymouth and a Ph.D. in Finance from City University Cass Business School in London.

Chapter 1

Fundamentals of Ship Management

P.M. Panayides

1.1 Introduction

Shipping entails the movement of raw materials, commodities, semi-finished products and finished goods from places of low utility to places of high utility by sea. Maritime transport must be economical (low cost), efficient, safe and must fulfil the requirements of shippers (cargo owners), which apart from the above may also require on-time delivery, service reliability, high service frequency and flexibility in the provision of other maritime transportation solutions. To achieve such objectives, the shipping industry has organised itself over the years into a structure of different specialised markets with particular objectives to deliver services that fulfil customer requirements profitably and sustainably.

On this basis of understanding, the global shipping industry is a market of markets, which may be classified into commodity and type of ship design such as dry bulk market, tanker market (both clean products and dirty crude oil), container market, chemical tanker, car carrier market, etc., albeit with a degree of cross-over between market sectors—for example between the container and the general cargo and bulk markets.

For each market, ship-owning companies have also organised themselves in such a way as to manage the ships efficiently and effectively. Organisation entails the formation of different types of company structures and the formation of specialised departments and business units. While these ship-owning organisations tend to be physically located in the major maritime centres, the development of offshore locations has been utilised in order to minimise taxation. Over the years, growth and specialisation led to the formation of third-party ship management

P.M. Panayides (✉)
Cyprus University of Technology, Lemesos, Cyprus
e-mail: photis.panayides@cut.ac.cy

companies, thus fulfilling particular market needs of those ship-owning companies that chose not to manage their vessels in-house.

The aim of this chapter is to provide a high-level overview of the fundamental principles of ship management. This will include a description of company organisation and structures, as well as a review of ship management services and contractual arrangements. Particular reference will be made to the various activities required to manage a ship, including regulatory issues, environmental implications and performance management and measurement. Key topics in this respect include ship registration and flagging, the regulatory environment and issues of environmental performance management, energy efficiency and slow steaming, and managing and measuring ship management performance through the use of key performance indicators.

1.2 Ship Owning and Ship Management

1.2.1 Ship Owning

Ship ownership entails the investment by a company or individual in the purchase (or building) of the asset (ship), which will then be operated for a financial benefit (profit). This may also be referred to as ‘beneficial’ ownership. In contrast, a company may own a ship by virtue of ‘nominal’ ownership whereby the company is simply a ‘brass plate’ entity that has the legal ownership of the vessel for tax purposes; that company usually is residing in a flag of convenience country. In some cases, the ship-owning company may wish to confine its engagement to the financial benefit derived from ownership by way of bareboat chartering the ship to a charterer wishing to operate the vessel. This arrangement involves transfer of the operating risk to the charterer.

There is a wide variety of ship-owning entities. Some owners operate a single ship while others larger fleets. Some concentrate on ships of a particular type (fleet specialisation), while others operate a varied collection of vessels (fleet diversification). The type of vessel’s employment depends upon the market’s circumstances, the shipowner’s intentions and expectations, as well as the regulatory and geopolitical forces internationally. While in bulk shipping single-vessel ship-owning companies form the international rule of ship-owning, in liner shipping the need to offer extensive network services of high frequency has led to co-operation among operators, often resulting in pooling of shipping resources typically in alliances, which replaced the now outlawed liner conferences, and, in some cases, common ownership or management of vessels.

1.2.2 Ship Management

Ship management is defined by Willingale (1998) as *the professional supply of a single or range of services by a management company separate from the vessel's ownership*. *Professional supply* means that the ship manager (supplier) provides service(s) to the shipowner (user) according to contracted terms and in return for a management fee. Panayides (2001) defines ship management as the rendering of services in an outsourcing arrangement related to the economic and operational organisation of a ship as a revenue-earning entity. Outsourcing provides the opportunities to ship-owning companies to focus on those functions that will maximise earnings (e.g., chartering or buying/selling a ship), leaving ship managers to deal with cost control and operational tasks. Ship managers ensure that the ship complies with international rules and regulations, that it is seaworthy and always fit to carry cargo with operational reliability, safely and cost-efficiently. A key requirement from shipowners is that the asset (ship) is well preserved.

Third-party ship management involves the separation of ship ownership from the crewing, technical and, in some cases, commercial management of the vessel. A shipowner may manage his entire fleet or subcontract some parts such as crewing, technical or commercial management operations to professional ship managers.

Ship management is undertaken by companies separate from the vessel's ownership and involves tasks such as manning, training and appointment of both ship and shore-based personnel, sourcing of ship's supplies, giving advice on the available options for the ship's registration, trading, ship maintenance, etc. (Branch and Robarts 2014). According to Bjuggren and Palmeberg (2009), third-party ship management denominates the complete separation of ownership and control in maritime transport and illustrates that labour in shipping (the crew) is not tied to the asset (the vessel) to the same extent as in other industries. The merits of outsourcing and ship management have been researched and expounded primarily in the studies by Panayides (2001), Panayides and Cullinane (2002), Mitroussi (2004a) and Cariou and Wolff (2011a, b).

1.3 Company Structures

An organisational structure is the formal pattern of how a company arranges its organisational activities and functions (Gibson et al. 2006). There are numerous variations of ship-owning company structures. Some companies (or owners) may operate a single ship, whereas other companies are shipping conglomerates and may be operating in different markets via different entities and business units. Some companies have specialised fleets and focus on the operation of particular ship types in particular markets. Others may be more diverse in terms of ownership and operation (fleet diversification). The degree of specialisation or diversification depends primarily on the company's strategy, which is formulated on the basis of

external environmental factors and economic circumstances and represents the vision and mission of the company in its attempt to gain a competitive advantage in the market domain.

Over the years, as in other service industries, there has been a gradual shift in focus towards organisational structures that are more customer focused (i.e. structures developed around customer groups) in order for companies to develop and offer coherent customer-oriented solutions. Hence, companies in the shipping industry are nowadays formed to develop and offer transportation and ship management solutions to customers and have become more specialised, more organised and flexible and more innovative in doing so. Even diversified shipping conglomerates operate with predetermined strategic business units in order to achieve the above-mentioned goals. In addition, there is a drive towards reducing the number of levels in typical hierarchical company structures to structures that are flatter and would thus facilitate delegation and decentralisation of authority and faster decision-making.

1.3.1 Shipping Conglomerates

The diversification of shipping companies into other shipping and transportation markets has given rise to shipping conglomerates. A diversified shipping group would be an umbrella structure with business units in various shipping sectors, e.g. dry bulk, tanker, container, etc. Diversification is often driven by a strategy to hedge exposure to cyclical risk in different market sectors (Lorange 2009), although in the shipping industry this practice is not as prevalent as in other industries. A relatively small number of companies or business units have been successful in securing a public listing where shares are owned by institutional investors.

1.3.2 Traditional Shipping Companies

The characteristics of a traditional shipping company are epitomised by the key departments, like operations, technical, crewing and chartering, as well as an administration/management department. The company invests in newbuilding and second-hand ships and is responsible for finding employment for the ships in the spot market and/or the time charter market. In addition, depending on company policy, it may engage in ship sale and purchase. This is typical of dry bulk shipping companies. Ships are normally registered under one-ship-owning companies as a means to achieve tax-related advantages and to limit liability of the group. Single-ship-owning companies are registered offshore that provides higher levels of business confidentiality.

1.3.3 Liner Shipping Companies

A liner shipping company is responsible for operating a fleet of container or other types of dry cargo vessels such as MPPs. Vessels are employed in a liner service with fixed calls for loading and discharging and following a timetable with a pre-fixed and advertised geographical rotation ('itinerary' or 'liner schedule'). Normally this is done via an extensive network of offices that are located at the ports/country of destination. The main office is subdivided into departments that deal with marketing, ship operations, personnel and claims/legal. The operations are much more complex, not least in terms of attracting cargo, designing and operating cost-effective liner shipping routes and networks (Liu et al. 2014), utilising assets and achieving reliability in port calls and satisfying and anticipating the needs of a large number of customers. Notwithstanding the size of ship operations, several people are required to staff such a company properly before it can be fully operational. A liner shipping company is focused on securing bookings of containers (which may be made up of smaller consignments of various commodities) with a view to filling vessels.

Companies in liner shipping have developed various types of alliances and collaborations in order to share resources and assets among themselves and to formulate mutually beneficial strategies and seek operational performance improvements. Liner shipping companies have adopted the hub-and-spoke approach whereby long-haul, high-capacity containerships deployed on the main east-west arterial routes call at a limited number of hub ports that are 'fed' cargo by small feeder vessels that connect with outer or spoke ports. This allows the consortia/alliances to participate in upstream and downstream activities together (Panayides and Wiedmer 2011).

1.3.4 Shipping Divisions

This is a division of a company whereby shipping is not its primary activity, but it has high maritime transport needs and thus has invested in ships. A good example would be the shipping division of an international oil company. International oil companies usually invest in own assets in addition to chartering ships on time and voyage charters. Hence, part of the company's oil shipments is carried in company-owned vessels, and the division is responsible for all activities associated with the acquisition and operation of these vessels. Major investment decisions must pass through the central company board, and the division's management is mainly responsible for day-to-day operations.