



# A survey of shipping finance research: Setting the future research agenda

George Alexandridis<sup>a</sup>, Manolis G. Kavussanos<sup>b</sup>, Chi Y. Kim<sup>a</sup>, Dimitris A. Tsouknidis<sup>c</sup>, Ilias D. Visvikis<sup>d,\*</sup>

<sup>a</sup> ICMA Centre, Henley Business School, University of Reading, Whiteknights, Reading RG6 6BA, UK

<sup>b</sup> Athens University of Economics and Business, 76 Patission St, Athens, TK 10434, Greece

<sup>c</sup> Department of Commerce, Finance and Shipping, Cyprus University of Technology, 115 Spyrou Araouzou Street, P.O. Box 50329, 3603 Limassol, Cyprus

<sup>d</sup> School of Business Administration, American University of Sharjah, PO Box 26666, Sharjah, United Arab Emirates

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## ABSTRACT

Financing shipping related investment projects has always been a focal area of debate and research within the international maritime industry since access to funding can determine the competitiveness of a capital-intensive business as well as its success or failure under adverse market conditions. This paper provides, for the first time, a comprehensive and structured survey of all published research in the area of shipping finance and investment. The review spans approximately four decades (1979–2018) of empirical evidence, including 162 studies published in 48 scholarly journals, complemented with select books and book chapters. The study provides a bibliometric analysis and comprehensive synthesis of existing research offering an invaluable source of information for both the academic community and business practice, shaping the future research agenda in shipping finance and investment.

## 1. Introduction

The international maritime transportation industry facilitates between 80% and 90% of global commodity trade in volume terms and contributes significantly to the welfare and development of nations adding around \$380 billion a year via freight rates alone to the global economy.<sup>1</sup> Shipping is among the most cyclical industries with a number of idiosyncratic characteristics that set it apart from other sectors and make it a pivotal one to analyse from a financial economics perspective. Its most notable features are the derived nature of the demand for shipping services, the non-storable nature of the underlying asset (the freight service), the excess volatility and clustering, cyclicity and seasonality associated with freight rates and asset prices, the heightened sensitivity to international supply and demand forces and regulations due to the industry's hyperglobal nature, the fragmented structure of shipping business, as well as its capital and debt intensity. These attributes contribute to a challenging investment and capital raising environment and have triggered voluminous academic and professional research alike. Some of those features have also played a role in attracting the interest of the global investment community, with an ever-increasing number of investment managers introducing shipping transportation as an asset class in their portfolios, facilitating broader access for shipping businesses to the global equity and debt capital markets.

\* Corresponding author.

E-mail address: [ivisvikis@aus.edu](mailto:ivisvikis@aus.edu) (I.D. Visvikis).

<sup>1</sup> The shipping industry's share of global trade range is derived from UNCTAD (2015) and the International Chamber of Shipping (2017). For the sector's contribution to the Global Economy see Global Shipping Market Report in [Catalyst Corporate Finance \(2016\)](#).

According to data from Clarksons Platou, during the period 2005–2017, the aggregate capital invested in newbuilding vessels alone was more than \$1.5 trillion, with contracting reaching \$263 billion during the cycle peak of 2007. Being among the most capital-intensive industries by employing assets of high commercial value, and with debt typically accounting for the *lion's share* in the capital structure of a shipping business, requires access to substantial amounts of capital to facilitate the replacement of ageing vessels with new, more efficient and environmentally friendly, as well as to fund an active secondhand market. In turn, this renders corporate financial management decisions particularly important for shipping companies, affecting almost every aspect of shipping businesses, from cash-flow generation capacity (Drobetz et al., 2016b) to corporate ownership/governance structures (Andreou et al., 2014), and ultimately their value creation potential (Kang et al., 2016). Naturally, investment decisions and the associated financing choices entail significant challenges for shipping companies as documented in Paine (1990), Stokes (1997), Sloggett (1998), Panayides (2002), Harwood (2006), Syriopoulos (2007), Kavussanos and Visvikis (2016) and Schinas et al. (2015). In fact, the longevity of shipping companies is historically contingent on their access to finance with favourable terms and especially low interest rates (Stopford, 2009). Along these lines, the global financial crisis of 2008 and the ensuing environment of low freight rates further highlighted the importance of access to financing for shipping companies, enabling those with the capacity to finance new projects to weather the storm. At the trough of the cycle, a large number of companies faced financial distress, with Hanjin Shipping's bankruptcy filing in August 2016 providing a notable example. The crisis also emphasised the need for risk management strategies and tools to effectively manage the risks involved in running a shipping business – see for instance, Kavussanos (2002, 2010) and Kavussanos and Visvikis (2006a, 2011).

Early efforts to finance shipping projects involved mainly own equity, and subsequently smaller amounts of capital provided by banks. Since the early 1990s a growing number of shipping companies have relied on global capital markets – in a break from traditional sources of financing, such as bank loans – to diversify their funding sources and tap into a wider range of institutional and retail investors. To gain access to global capital markets shipping companies had to evolve from typically family-oriented businesses to corporate entities, which in turn led to a structural transformation and expedited significant improvements in their corporate governance. Given the significance of shipping finance and investment as a specialised area of maritime transportation, the research conducted in this area has been voluminous since the first empirical study published by Yolland (1979). In spite of the impact of shipping finance to both the academic community and business practice, to date, and to the best of our knowledge, there is no comprehensive study of research in this area. Notwithstanding, a number of studies have attempted to address conceptualization, methodological issues, theoretical developments, academic taxonomy and future research directions in areas relevant to transportation, such as quantitative modelling in shipping (Glen, 2006); port management (Steenken et al., 2004; Pallis et al., 2010; Pallis et al., 2011; Woo et al., 2011, 2012; Ng, 2013), logistics and supply chain management (Mentzer and Kahn, 1995; Ho et al., 2002; Burgess et al., 2006; Panayides, 2006), shipping freight derivatives (Kavussanos and Visvikis, 2006b, 2008), ocean container shipping (Lau et al., 2013, 2017; Lee and Song, 2017), and maritime transport (Shi and Li, 2017).

To fill this research gap, the current study provides a comprehensive survey and analysis of the existing research by examining, to the best of our knowledge, all academic studies published in scholarly journals in the area of shipping finance and investments during the period 1979–2018 (April), complemented with select books and book chapters, and provides suggestions in an effort to set the future research agenda. In order to provide a wide-ranging review of the literature we first identify all studies related to shipping finance and investments published in scientific journals. We further scan the references of all these studies to identify other relevant research published in journals within various social science areas, such as finance, economics and management. This process yields 162 papers published in 48 scholarly journals. The journal titles along with aggregate paper counts for four sub-periods are presented in Table 1. It turns out that the majority of shipping finance and investment studies have been published in transportation and maritime academic journals. Notably, shipping finance research is concentrated in a small number of journals with 94 out of 162 studies having been published in: Maritime Policy and Management (38 paper counts), Transportation Research Part E: Logistics and Transportation Review (35 paper counts) and Maritime Economics and Logistics (22 paper counts). We further classify the papers examined in this paper into four major research areas inspired by the classification structure typically adopted in the mainstream corporate finance literature. These are: (a) sources of finance and capital structure in shipping, (b) shipping investment and valuation methods, (c) corporate governance of shipping companies, and (d) risk measurement and management in shipping.

We next conduct a comprehensive bibliometric analysis of the related academic literature in shipping finance and investments which aims to provide additional information on the frequency of publications in each research area identified, the methodological approaches utilised, co-authorship associations and research impact. In the second part of the paper we provide a comprehensive review of the literature and critical discussion of the empirical evidence on the four aforementioned distinct research areas. Each section identifies pivotal gaps in the literature along with potential paths for further research. All sections include a summary of the research designs and findings, tabulated concisely for ease of reference.

This survey paper contributes to the extant literature in several important ways. First, to the best of our knowledge, it is the first to offer a comprehensive overview of the research findings in the area of shipping finance. Second, the bibliometric analysis performed highlights more succinctly the research developments in the area of shipping finance. Third, the paper provides a comprehensive synthesis of all published research in shipping finance and investments and offers an invaluable source of information for both the academic community and business practice. Finally, it shapes the future research agenda on shipping finance and investments by critically discussing the gaps in the extant literature and the potential avenues for further research. The rest of this paper is organised as follows. Section 2 provides a bibliometric overview of all studies included in this survey. Sections 3–6 offers comprehensive review of the literature, key empirical findings and suggestions for future research on the four major research areas in shipping finance and investments. Finally, Section 7 concludes the paper.

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