CHAPTER 6

FINANCING GREEK SHIPPING: MODERN INSTRUMENTS, METHODS AND MARKETS

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ABSTRACT

The chapter discusses ship finance and analyzes modern instruments, methods and markets that shipping companies employ to fund their investment projects. In a highly dynamic and volatile business environment, ship finance becomes highly sophisticated, innovative and complex. Emphasis is placed particularly on financial innovations employed by Greek shipping companies that rank on top of international shipping. These financing instruments include new forms of bank lending, leasing and syndication, international equity initial public offerings (IPOs), private equity funding, high-yield bond issues, securitization and forward freight agreements (FFAs).

6.1. INTRODUCTION: THE ROLE OF CAPITAL MARKETS

This chapter focuses on the financing side of shipping business. Despite its importance, shipping finance has been rather neglected in applied financial

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research. This is partly due to an introvert, non-disclosure, approach shipping companies prefer to follow in financing their investment plans. On the other hand, the modern financing instruments and tools that market players employ to fund-raising in shipping become highly sophisticated, innovative and complex.

In line with the major topic of the Greek paradigm in shipping, attention is paid to the financing instruments, and methods employed predominantly in Greek shipping. This is a natural outcome, since Greek shipping remains on top of international shipping business, leaving behind Japan, Germany and China (14.5%, 7.9% and 7.2% of world fleet, respectively). According to 2006 figures, Greek shipping controls a total of 3027 vessels, which represents an aggregate capacity of 163.4 million dwt and corresponds to a world fleet share of 18% (UNCTAD, 2006). Nevertheless, the analysis of modern financing, methods, markets and tools presented in this chapter have obviously wider applications to international shipping business. Prior to the discussion on the financing of the Greek shipping, it is useful to highlight the central role capital markets play in modern shipping finance, an issue that we now turn to.

Investment decisions in the shipping industry bear a significant element of business uncertainty, since varying and persistent volatility is apparent between different shipping market segments. This is due to a number of critical factors, including mainly the derived nature of demand for shipping services that is sensitive to economic growth, the cyclicality in freight rates and vessel prices, and the idiosyncratic sectoral characteristics of the shipping industry. Intensive capital resources tied-up in the underlying real assets (vessels) can induce tremendous financial risk that, at times, may lead to adverse outcomes. As a consequence, the issue of optimal capital structure and the financing tools shipping companies employ are in the core of shipping business.

As shipping companies adjust to a dynamic and rapidly changing environment, so do the financial methods and instruments available to raise funding and materialize vital investment budgets. The core business strategy of shipping companies is gradually shifting from simple profit maximization to an increase in firm market value. To attain this, shipping firms should consistently focus on promoting investment plans that bear growth potential and have positive returns that outperform more than required costs undertaken.

Intensified competition in the shipping markets has led shipping companies to constantly pursue operational flexibility, managerial efficiency and robust financial liquidity. A shipping company can attain business

growth following either an internal or external growth path. Subject to freight market conditions, shipping companies can expand their fleet by building new vessels or purchasing second-hand vessels. On the other hand, mergers, acquisitions and strategic alliances (pools) can be an alternative path to internal growth. Nevertheless, these growth strategies, in addition to the need for replacement of older vessels, require substantial capital support and careful financial planning.

Two broad approaches can be distinguished in shipping capital financing: (i) self-sustained (internal) financing and (ii) external financing. The first financing approach is based on robust corporate profitability and implies that retained earnings are sufficient to finance investment decisions. Instead of withdrawing and distributing profits as cash dividends, the management prefers to reinvest these funds and finance new projects. In the second financing approach, the company turns to the international capital markets to raise the required investment funds. Debt financing may come from financial intermediaries' lending or debt markets by issuing corporate bonds or commercial paper. Equity markets, alternatively, can enhance own funding. Fund raising then can be realized through a combination of traditional bank lending, private placements, public issues of equity and bonds, commercial paper and, more recently, securitization.

Capital markets play a key role in the promotion of shipping business growth and value creation by performing the following fundamental functions. As primary markets, capital markets act as intermediaries to provide the funds required to financing new investment projects and sustain business growth. Fresh funds are channelled to firms in need through the issuance of securities. Furthermore, as secondary markets, capital markets provide an efficient mechanism for trading outstanding securities. They contribute, thus, to potential value creation that is reflected on corporate security prices.

This chapter presents a concise and integrated framework in shipping finance. It analyses modern financing instruments, tools and capital markets that have come into play in recent years. Section 6.2 summarizes key issue in bank lending to shipping, syndicated loans and leasing. Section 6.3 discusses in detail the role and function of equity markets and the recent shipping initial public offering (IPO) wave. Section 6.4 covers the bond markets and the revitalized interest in shipping high-yield bond issuing. Section 6.5 explains the function of securitization that is gradually employed in financing a real asset-backed industry such as shipping. Section 6.6 deals with risk management and forward freight agreements (FFAs), as financial instruments to hedging risks in shipping. Finally, Section 6.7 concludes.

6.2. BANK LENDING TO SHIPPING

6.2.1. Critical Issues

Shipowners, bankers and shipbuilders are in search of modern financial instruments to fund ship acquisitions. The basic elements in any ship loan arrangement are relatively simple and straightforward. These can be summarized into three fundamental types of borrowing (Stokes, 1997):

- The standard ship mortgage loan with or without assignment of charter party.
- The fixed interest credit for newbuildings advanced on behalf of the shipbuilder by a bank with the backing of a state guarantee.
- Financing up to 100% through a lease or bareboat/hire-purchase arrangement.

A number of core issues are important for shipping loans. External finance (debt) should come up to a level and term-horizon (length of repayment period) that prospective investment cash flows can sufficiently meet financing expenses. This point is interrelated to newbuilding price trends, second-hand vessel price prospects and freight rates trends. The cost of funding, as reflected in ship lending interest rates, is a key issue of major concern. Despite declining interest rates in recent years, shipping is a highly volatile and cyclical industry and risk premiums on shipping loans have remained relatively tight. Currency risk is another important issue, associated particularly with potential credit facilities originating from shipyards. To this end, modern hedging instruments, including currency derivatives and currency swaps of varying durations, can contribute to foreign exchange risk control.

Despite a recent shift towards alternative financing instruments, such as equity funding and high-yield bonds, bank lending continues to dominate ship finance. Low interest rates and exceptionally strong freight markets over the previous three years have led to extensive vessel newbuildings and have kept bank lending steadily robust. Despite a recent slowdown in freight rates, vessel values remain high, at multiple levels compared to previous years. The unprecedented liquidity experienced particularly by Greek shipowners is channelled partially into newbuildings or young tonnage. Banks remain positive in lending clients with robust liquidity, conveniently arranging front-loaded repayment schedules by case.

6.2.2. Greek Shipping Lending

Since Greek shipping ranks on top of world shipping business in terms of tonnage and volume, it is of interest to have a closer look at Greek shipping finance. The trends prevailing in this market segment reflect indeed the structural shifts and prospects for the overall shipping market. Recent empirical evidence indicates that the Greek shipping loan portfolio has increased sharply by both Greek and foreign banks. Moreover, this trend seems to prevail, despite robust cash reserves available to many shipping companies. Major reasons for that include loan refinancing at more favourable terms and extensive investments in new tonnage. As shipping markets exhibit some slowdown, rational shipowners proceed to prepayment or refinance of their loans. Taking advantage of exceptional liquidity enjoyed over the last three years, shipping companies are now improving their loan-to-value ratios. As a result, in 2005, the overall ship lending portfolio exhibited further significant increases up to USD 36.11 billion (+11.6% relative to 2004). This outcome is even more contrasting compared to 2001 figures, reflecting a growth rate of 119%, with the total loan portfolio then at USD 16.53 billion. International banks active in Greece have gained the largest growth share in ship lending, with a portfolio of USD 19.54 billion in 2005 and an average annual growth of 29% (Fig. 6.1). This shift has been associated with two major foreign banks starting operations in Greece, namely Deutsche Schiffsbank and Natexis (Petrofin Bank Research, 2006).

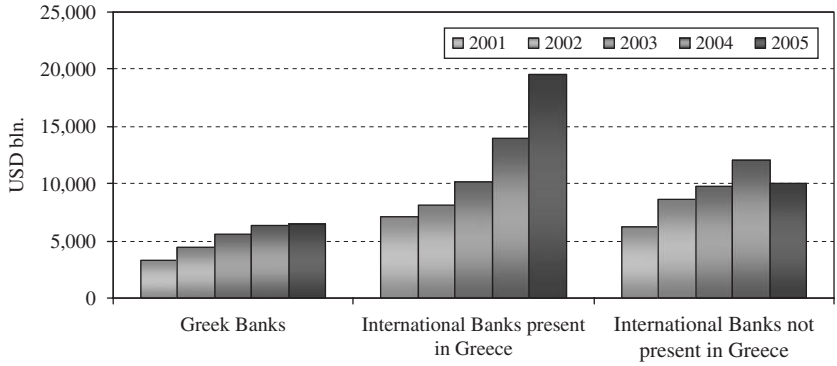

Fig. 6.1. Bank Loan Portfolio to Greek Shipping. *Source:* Petrofin Bank Research (2006).

European banks dominate the group of the ten major lenders to Greek shipping. Nevertheless, two Greek banks are also included in the top ten list (Table 6.1). These ten banks account for over two-thirds of total lending with a portfolio of USD 24.24 billion. Royal Bank of Scotland remains by far the major lender for years, whereas HSH Nordbank ranks second, following a substantial business increase. However, after a period of stability, the total number of banks engaged in Greek shipping finance has declined down to 40 in 2005 from 50 in 2004. Reasons for this drop include consolidation among banks and also exit from the sector of those banks with unwinding portfolios. Major declines were experienced by French, Belgian and North American banks.

Despite marginal growth rates in total loan portfolio of lead managing banks during 2003–2004, a significant increase is seen in 2005 by 40% (43%) relative to 2004 (2003), respectively (Table 6.2). This resulted to total loan portfolio controlled by lead managing banks coming up at USD 7.24 billion (Petrofin Bank Research, 2006). These are loans contributed by banks other than the lead managers. In cases where there is more than one lead manager, the syndicate/club amounts involved were split accordingly. Citigroup remains by far the major leader in this category and has seen an increase in its total controlled lending by 50% compared with 2004. Although Greek banks are not strongly active in the lead manager role as yet, major players, such as Alpha Bank, EFG Eurobank, National Bank of Greece and First Business Bank, are intensifying their participation. As Greek shipowners are anticipated to increase demand for investment funding (fleet renewal or

Table 6.1. Leading Banks Holding Greek Shipping Loan Portfolios.

Bank	Portfolio (USD billion)	Country
Royal Bank of Scotland	8.099	UK
HSH Nordbank	3.468	Germany
Deutsche Schiffsbank	3.400	Germany
Credit Swiss	1.850	Switzerland
Calyon	1.500	France
Alpha Bank	1.480	Greece
HSBC	1.171	UK
National Bank of Greece	1.140	Greece
DVB	1.070	Netherlands
DnB NOR	1.067	Norway

Note: Figures as of end 2005. Totals include loans drawn plus loans committed but not yet drawn.
Source: Petrofin Bank Research (2006).

Table 6.2. Lead Managers of Greek Ship Finance Syndicates & Club Deals.

Lead Manager	Managed Portfolio (USD million)
Citibank	2165
Aegean Baltic	1153
Credit Swiss	800
Deutsche Schiffsbank	600
Fortis	400
ABN Amro	320
Bank of Scotland	305
DVB Nedship	285
HSH Nordbank	218
Commerzbank	171

Note: Based on loans committed by third-party banks (excluding own loan outstandings).
Source: Petrofin Bank Research (2006).

public listing), more banks will be interested in forming coalitions to meet this rising trend.

Greek banks active in shipping lending have increased steadily their market participation. Eight leading Greek banks are included in the top 30 overall lenders to Greek shipping, as they have managed to almost double their positions between 2001 and 2005 (Petrofin Bank Research, 2006). Greek banks have managed to gain a significant market share in shipping lending, although they have entered the market relatively recently (mid-to-late 1990s). The extensive fleet renewal plans and newbuilding orderings in past years have been financed by Greek banks through traditional mortgage-based lending and IPO underwritings. Competitive advantages against international (bank) peers include high-quality services, flexibility, commitment and cross-selling (Table 6.3).

6.2.3. Syndicated Loans

The upward trends in ship values and the volatile behaviour of the shipping markets have led individual banks to pursue the sharing of lending obligations in shipping loans with other peers, forming, thus, syndicated shipping loan schemes. This may derive from (internal/external) regulatory requirements, limited bank capital adequacy, lending constraints in certain markets and industries or, fundamentally, from a risk diversification approach. In a syndicated loan, a group of banks will each commit themselves to make part of the loan. Each bank's obligation to lend is

Table 6.3. Leading Greek Banks to Shipping Lending.

Bank	Portfolio (USD million)
Alpha Bank	1480
National Bank of Greece	1140
Emporiki Bank of Greece	938
Piraeus Bank	897
EFG Eurobank	602
Laiki Bank	476
First Business Bank	457
Egnatia Bank	266
Aegean Baltic	107
Omega Bank	60

Source: Petrofin Bank Research (2006).

entirely separate from the obligations of the others. One bank (the agent or leader) will administer the facility on behalf of the syndicate, dealing with the fixing of interest rates, receiving repayments and accounting to the other syndicate members (Harwood, 1991, p. 16). Commonly, the leading role is granted to the bank making available the largest share of the total loan.

On a world scale, the syndicated shipping loan market experiences robust growth trends in recent years. The total value of syndicated shipping loans totalled USD 41.78 billion in 2005 (Matthews, 2006a). Two Norwegian shipping banks, Nordea and DnB NOR, have seen high levels of activity, attaining first and second places respectively in the ranking of syndicated loans as both mandated arranger and bookrunner (Table 6.4). These two banks account for a market share of 42.7% for bookrunning of syndicated shipping loans and 42.4% for mandated arranger. European banks dominate the leading positions in these funding market segments over recent years. A number of leading banks (11) acted as lead arrangers in deals valued at a total of over USD 1 billion in 2005, while the top eight banks were bookrunners for deals aggregating over USD 1 billion (Matthews, 2006a). These figures indicate a concentration of syndicated shipping loans among few leading banks. Overall, banks are seen to prefer sharing shipping loan risks instead of bearing them alone, since funding required in shipping is rising exponentially. This was partly related to the IPO wave seen recently that also involved in purchase of whole fleets.

To sum up, taking into account the relevant bank lending figures in 2006 and the prevailing freight market conditions, market forecasts indicate that lending activity may experience some short-term slowdown. Although this

Table 6.4. Top Bookrunners and Mandated Lead Arrangers for Syndicated Shipping Loans.

Rank	Bank	Deal Value (USD million)	Number	Share (%)
Bookrunners				
1	Nordea Bank AB	9700	41	23.2
2	DnB NOR Bank ASA	8129	35	19.5
3	Citigroup	3889	17	9.3
4	Calyon	3208	5	7.7
5	BNP Paribas	2584	12	6.2
6	RBS	2072	3	5.0
7	ING	1622	11	3.9
8	Deutsche Bank	1177	3	2.8
9	HSBC	851	5	2.0
10	Fortis	697	3	1.7
Mandated lead arrangers				
1	Nordea Bank AB	8987	53	21.5
2	DnB NOR Bank ASA	8751	49	20.9
3	Calyon	3721	7	8.9
4	Citigroup	2968	19	7.1
5	BNP Paribas	2690	14	6.4
6	RBS	2465	5	5.9
7	HSBC	1812	12	4.3
8	ING	1311	12	3.1
9	HSH Nordbank	1256	6	3.0
10	Fortis	1196	10	2.9
	Total	41,784	165	100

Note: Figures as of 2005.
Source: Adapted from Matthews (2006a).

trend may be intensified in case ship prices fall further, it may, nevertheless, be followed by some recovery, if shipowners proceed to take advantage of lower second-hand prices. Despite some stabilization in shipping bank lending, it still remains a highly competitive market. Upward interest rates support margin increases but aggressive players insist on keeping them low. On the other hand, Greek shipowners are seen to operate larger and younger vessels with more efficient organization and robust financial liquidity. In this environment, banks appear to take a more cautious stance overall, paying attention to financial ratios such as 'vessel value relative to earnings'. Combined with declining trends in shipbuilding activity, these developments are anticipated to result to a slowdown in bank lending which is also becoming more selective.

6.2.4. Leasing in Shipping

Leasing is an alternative method in shipping finance that bears some similarities to bank lending. Historically, leasing has been popular and developed in shipping finance since 1960s and 1970s, initially in the US and then first to the UK and subsequently to the rest of Europe. A finance lease represents 100% finance and does not require additional security in the form of mortgages on other ships in a company's fleet. If a shipowner had to raise 100% financing in a ship mortgage loan, he should have to attain a highest possible vessel employment to meet required cash flows to debt servicing and, in addition, would be burdened by substantial cross-collateralization on other debt-free ships. Leasing has become more appealing as a financing approach since ship prices have risen.

In a lease scheme, the financing institution (legal owner of the vessel) provides full financing for the user (shipowner) over an extended period in return for much narrower security than it would insist on as an ordinary security lender (Stokes, 1997). Although similar in nature to borrowing, a lease does not entail a charge on any of the shipping company's assets or credit lines, but it does impose a continuing charge on income. Another attractive aspect of leasing is the period obtainable. In a financial lease, the lessor is seeking to amortize fully his capital outlay on the asset and to provide for his borrowing costs and profit margins. In cases of capital-intensive underlying assets, the period of the primary lease will usually be in excess of 10 years, since the lessor accepts that the period must reflect the lessee's ability to earn money on the asset concerned. The most convenient period-horizon is usually mutually reached and is based on lessor's view about revenue-earnings potential of the underlying asset and the professional record of the lessee (Stokes, 1997). Another attractive issue about leases is that they are predictable and permit a shipowner to plan his cash flows, as the earnings level required to cover costs is straightforward. The usual arrangement is a fixed term lease which cannot be affected by changes in tax or money cost, although variable rate leases can also be arranged.

A fair arrangement would be based on a back-to-back deal, whereby the lessor can structure the period and terms of the lease precisely to match the revenues earned by the lessee on a long-term contract (Stokes, 1997). Nevertheless, in practice, deals based on such ideal terms are rare, as the relevant contracts are not usually of long-term maturity. Furthermore, financial innovations are sometimes produced by combination and improvement of existing instruments. To this end, the use of leasing to finance newbuildings incorporates the use of the fixed interest credit

obtainable by the lessor from the shipyards and can be considered as a combination of a lease and a newbuilding shipyard credit. Leasing is a highly attractive financing method for high-cost liner vessels. It can conveniently finance the increasing activity seen at the more commercially sophisticated end of the bulk shipping market (Stokes, 1997). Shipping companies continue to pay attention to leasing (bareboat charters), as they consider it as an alternative method of financing fleet expansion with limited new equity. Hence, the lessor, providing 100% financing for vessel acquisition, in effect becomes an equity substitute (McGroarty, 2006a).

Compared with other transportation sectors, lease finance is seen to have a modest penetration in shipping. Shipping companies gradually exhibit a stronger preference to leasing, as shipowners realize that controlling the vessels and having flexibility in fleet deployment is more important than actually owning the vessels. This trend is anticipated to strengthen further, as innovative financial structures can provide competitive financing, improved balance sheets and, in some cases, participation along with the lessors in future increased value of the fleet (McGroarty, 2006a).

6.3. EQUITY MARKETS AND SHIPPING IPOS

6.3.1. Shipping Companies Going Public

As the business environment changes dynamically in the shipping industry, shipping companies turn to new financial instruments and markets to finance their investment plans. A gradual shift is apparent in shipping finance more recently, induced by economic recessions and shipping crises. This shift has been reinforced by the interactive impact of a number of factors, including:

- erosion of the capital reserves in many shipping companies,
- substantial contraction of banking finance,
- increasing attention on 'capital adequacy' as a critical issue for all parties concerned (shipping companies, banks, investors),
- substantial capital requirements to replace the ageing wet and dry fleets worldwide,
- internationalization and integration of world capital markets,
- structural and cultural reorganization of shipping companies, induced by capital markets requirements and investors' expectations,
- promotion of corporate governance, social responsibility and business ethics concepts.

Despite their central role in investment funding, stock markets had traditionally only limited participation in shipping finance. Close family ownership ties, reluctance of shipowners to dilute company control, non-disclosure of sensitive company information and unattractiveness of shipping stocks to institutional and private investors, due to volatile cash flows, have been major reasons for that (Grammenos, 2002).

Only recently shipping companies have discovered the virtues of public listing on international stock exchanges. The recent shipping IPO wave has tackled investors' appetite, as the latter rediscover the attractiveness of exchange traded shipping companies. This trend has been supported by unprecedented high-freight rates and strong shipping company balance sheets in an environment of bullish stock markets. Steady growth rates in the US economy and high-growth rates in the Chinese economy over the last three years led the shipping sector to a peak in late 2004, generating strong earnings cash flows for shipping companies.

Shipping IPOs are distinct from those of ordinary industrial or service companies. The market value of a shipping company is often closely associated to the underlying value of the physical assets (vessels). In this respect, shipping IPOs bear similarities with the respective IPOs of closed-end funds and property companies. Furthermore, due to extensive information flows in international vessel sales and purchase markets, shipping IPOs tend to exhibit lower information asymmetry. Due to the cyclical nature of shipping business, shipping companies tend to prefer equity markets when shipping market prospects appear to be promising.

6.3.2. Key Factors to Shipping IPOs

A fundamental problem for shipping companies interested in raising equity in the stock market is the pricing of the new issues. Since the majority of shipping IPOs refer to bulk shipping offerings, the issuer will set an IPO price at or near market-adjusted net asset value (NAV) per share. This is reasonable in cases where company earnings and cash flows fully support NAV (Stokes, 1997). In practice, however, ship prices in the second-hand market do not necessarily reflect operating cash flow and earnings generated by the ships. More frequently, ship prices represent a very high multiple of operating cash flow, whereas in certain bulk shipping segments operating earnings have been negative for a number of years.

Equity financing in the stock market can be an attractive source of capital for shipping companies taking into account the low implied cost of capital

relative to other sources of funding. This is related to the fact that shipping companies traditionally pay low or no dividend to investors and investors accept this practice, since, due to the capital-intensive nature of shipping business, retained earnings are channelled to fleet replacement and expansion. On the other hand, investors' target of expected return on equity is set at high levels. Assuming that a shipping company can borrow at a spread over Libor (+1% to 2%), this can result to borrowing costs on senior debt of, say, 7%. Subordinate debt might cost 10–12% per annum, on a 10-year maturity. Investors, however, will typically seek a return on equity of 15–20% per annum, given the volatile freight markets and their risk exposure (Stokes, 1997). This implies that most shipping companies, rated below investment grade, must attain return on equity well above average stock market returns in order to prevent their share price declining.

The key role of equity markets on shipping business has been surprisingly neglected in past empirical research. An exception is Grammenos and Marcoulis (1996), who studied shipping IPOs in a cross-country framework. A sample of 31 IPO cases was examined in seven different countries (US, Norway, Sweden, Greece, Luxembourg, Hong Kong and Singapore), over 1983–1995. Shipping companies with prime business on vessel operations were mainly considered and critical factors associated with shipping IPOs were investigated. As these companies grow bigger over time, they reorganize their structures and meet their capital needs in the stock markets more frequently.

The following important factors were considered on IPO stock market performance: gross proceeds of the IPO issue, size of the company, proportion of equity offered, gearing level, age of the company and age of the fleet. Gearing was indicated to be the single most statistically significant factor in explaining IPO stock market performance. Furthermore, the average initial day return of the sample shipping IPOs was found to be consistent with past empirical evidence; underpricing of small magnitude was concluded (5.32% on average). IPO costs were estimated at 8% of the amount raised with a high-fixed cost component in average direct costs; the highest direct costs were in the US stock markets and the lowest in Norway. The purpose of the issue, the number of offers, the average proceeds, the average company size and the cross-country listings for these IPOs are summarized in Tables 6.5 and 6.6. Vessel acquisitions receive by far the highest part of the IPO funds raised and asset play strategies follow at a distance.

Shipping companies with high-pre-IPO gearing levels are seen to experience more underpricing of their share issues than the companies with low-pre-IPO gearing levels. In the context of reorganization, shipping companies may have to lower their gearing level to minimize potential stock

Table 6.5. Shipping IPOs: Investment Purpose – Funds Raised.

Issue Purpose	Number of Offers	Average Gross Proceeds (USD million)	Average Company Size (USD million)
Vessel acquisition	19 (63%)	59	153
Asset play	7 (24%)	61	72
Debt repayment	3 (13%)	62	203
Trading activities	1 (3%)	48	152

Note: Period: 1983–1995.
Source: Grammenos and Marcoulis (1996).

Table 6.6. Shipping IPOs: Cross-Country Analysis.

Stock market	Vessel Acquisition	Asset Play	Debt Repayment	Trading Activities
USA	2	6	2	–
Norway	8	–	1	1
Sweden	4	–	–	–
Greece	3	–	–	–
Luxembourg	–	1	–	–
Singapore	3	–	–	–
Hong Kong	–	–	–	–

Source: Grammenos and Marcoulis (1996).

market underpricing. Furthermore, shipping companies that offer more equity to the public exhibit higher underpricing than those offering less equity. This is related to information signalling to market participants, implying a kind of 'private' valuation by shipowners for the amount of equity retained. Risk averse shipowners would improve expected utility by holding a diversified portfolio and not only a large stake in their own firm. Since this is not the case in companies offering limited equity, it may signal that these shipowners are based on an implicit 'fair' firm value. In this case, shipowners of high-value companies would prefer to forego diversification benefits but avoid selling undervalued stocks. As investors realize shipowners' positioning, they would be keen to invest on shipping stocks of companies where owners are retaining larger holdings.

6.3.3. Shipping Business and Equity Markets

Studies on shipping stocks remain limited in number and scope. More recently, few empirical works have investigated the relationship of shipping

business and stock markets from different perspectives. These include the behaviour of shipping stocks in the international equity markets, the identification of key risk-return characteristics, the comparative analysis of the shipping sector to complementary or substitute transportation sectors and the dynamic management of investors' portfolios consisting of shipping stocks, inter alia.

A comparative sectoral analysis focused on stock market risk perception of US-listed water transportation and other sectors (Kavussanos & Marcoulis, 1997). The study considered various transport and energy sectors, including air transportation, rail transportation, trucks and other related industries such as electricity, gas, petroleum refining and real estate over the period July 1984–June 1995. Cross-sectional differences in the returns of the companies in each industry were related to the stock market and to the following microeconomic factors: market value of equity; book to market value of equity ratio; earnings to price ratio; asset to market value of equity and asset to book value of equity. The empirical findings indicated that water transportation is the only transportation industry which exhibits lower systematic risk than the market and that the asset-to-book ratio, along with the market, has explanatory power over its cross-sectional returns. These micro-factors were significant in explaining stock returns but were seen to vary between industries.

A recent study investigated the impact of the macroeconomic environment on shipping stock returns (Grammenos & Arkoulis, 2002). Based on a sample of 36 shipping companies, listed in 10 stock exchanges worldwide over 1989:12 to 1998:3, the study examined the relationship of global macro-economic sources of risk with shipping stock returns internationally. The model employed the return on the world equity market portfolio and innovations in the following pre-specified set of global macro variables: (a) industrial production, (b) inflation, (c) oil prices, (d) fluctuations in exchange rates against the US dollar and (e) laid-up tonnage. Empirical evidence indicated several significant relationships between returns of international shipping stocks and global risk factors. Oil prices and laid-up tonnage were found to be negatively related to shipping stocks, whereas the exchange rate variable to display a positive relationship. The macroeconomic factors were concluded to exhibit consistent interrelationship patterns in the way they are linked to the shipping industry worldwide.

An international comparison across shipping-related industries was undertaken in a study attempting to identify diverging risk characteristics (Kavussanos, Juell-Skielse, & Forrest, 2003). Comparing the behaviour of shipping-related company stock returns, the objective was to reveal whether

systematic risk differs from the average in the market and across sub-sectors of the maritime industry. Based on a postal questionnaire survey, 108 publicly listed shipping and shipping-related companies, across international stock exchanges, were classified by sector according to their core business activity. The capital asset pricing model (CAPM) was employed to model stock returns and measure sector systematic risk, over 1996–1999. Stock returns were found to be mostly negative, whereas the systematic risk of the drilling and offshore sectors was significantly higher than those of all other sectors. Similar levels of systematic risk were seen for the bulk, tanker, container and ferry sectors but the systematic risk of the cruise sector was found to lie in between these two groups. For all of the sample companies, systematic risk was lower than the market average.

The dynamic asset allocation and active management of shipping stock portfolios has been the core objective of a recent study (Syriopoulos & Roumpis, 2008). Alternative dynamic volatility models investigate the risk and return characteristics of a carefully selected sample of shipping stocks, in order to gain some insight on potential asset allocation opportunities. As private and institutional investors are in search of alternative style investments, the assessment of stock volatility is a critical issue for efficient asset allocation, dynamic portfolio management and firm valuation. According to the empirical findings, shipping stock returns exhibit a highly volatile profile, in accordance with corresponding (tanker and dry bulk) earnings. Sectoral and company fundamentals may affect shipping stock volatility that was found to be sensitive to asymmetric shocks. The results indicated superior portfolio returns for shipping stock portfolios relative to market benchmarks, albeit associated with higher risk levels.

6.3.4. Shipping in International Equity Markets

In the 1980s, the universe of publicly listed shipping stocks was small and London was the principal stock market for shipping stocks. Apart from London, shipping stocks were also listed in the New York stock market. In the 1990s, Oslo took the lead in Europe as the favourable stock exchange for shipping IPOs. Market changes had resulted to London losing the leading role, whereas in the US a series of de-mergers and spin-offs of shipping businesses led to the expansion of shipping sector. A number of Asian stock markets have also attracted shipping IPOs, including Hong Kong, Singapore, Bangkok and Taiwan.

Historically, shipping stocks have not been a highly attractive instrument for investors (e.g. Erdogan, 2005). This adverse attitude may be partly

justified on the negative episode in the high-yield bond market in the late 1990s. More recently, the US stock markets, NYSE and NASDAQ, have regained their leading role as they attract most shipping IPOs. Oslo follows at a distance now, leaving London stock exchange behind. New York hosts the largest number and value, with 25 shipping companies of total value at USD 55 billion, whereas 21 shipping companies are listed in Oslo and have an aggregate value of USD 15.4 billion (the number of wider maritime companies is larger). Strong advantages of the US capital markets include fund-raising depth, improved position in the investment community, improved share liquidity, reliable pricing, high corporate reputation and exposure to an international investor base.

Except from Oslo, European stock markets have experienced declining trends in shipping market value from more than 1% in the early 1990s to 0.6% of the total recently. Taking into account the leading role of US markets and the upward coming Asian markets, European stock markets may see further declines in shipping market value. According to market participants (Matthews, 2006c), reasons explaining the limited presence of the shipping sector in the European markets include the highly fragmented industry structure, the ownership structure (as founding families remain major shareholders), the large number of relatively small private companies, the decision of some public shipping companies to go private and the low limited number of IPOs in Europe relative to the US. Based on Clarkson's Public Shipping Database, there were 169 shipping companies listed worldwide at the end of May 2006, with a market value of USD 207 billion, although pure shipping companies are only about half that number (Matthews, 2006c).

A critical issue relates to the motives driving shipping companies to get listed in international stock markets. In the past, the strict requirements of transparency and disclosure that listed companies should meet was a deterrent factor for many shipping companies to the stock market, especially at volatile market times. However, this attitude is gradually abandoned. Stock markets would appear to be a reasonable choice for companies with relatively stable income flows and growth potential. With interest rates remaining at relatively low levels, banking finance may appear to be a cheaper funding alternative. Nevertheless, a number of shipping companies have decided to go public and raise funds quickly (despite significant public listing costs), in order to take advantage of the robust freight markets and investors' positive sentiment towards shipping stocks. Still, a number of recently listed shipping companies have experienced substantial market value losses, since freight markers have moved on a downward path recently.

This has not been an encouraging development for cautious investors and it may prove to be more difficult for shipping companies to raise funds from the stock markets in the future. Good quality shipping IPOs can be successful although it is not always easy to sell them to investors, as was the case with Genco, for instance. Although investors' sentiment may not be as positive as it was earlier, fair IPO pricing, backed by robust earning cash flow streams and supported by reasonable freight markets, can conclude to successful shipping IPOs. A critical advantage of shipping company listings is related to the fact that shipping is a real asset backed business and certain risk levels can be still acceptable by investors with some confidence.

In the recent, intensive IPO period (mid-2004 to end-2005), the total value of shipping IPOs and secondary listings was in excess of USD 4 billion (Matthews, 2006c). Although most attention is paid to the leading role of the US markets, some transactions are seen in Asia, whereas Oslo continued enjoying high levels of shipping stock activity. Other stock markets, such as London, have seen shipping business reducing, primarily due to companies going private or to mergers and acquisitions (such as the P&O acquisition by DP Ports World).

Overall, despite recent stock market activity, shipping – even transportation sector as a whole – still lags behind in the expansion seen in global equity market values. According to market participants (Matthews, 2006c), the market capitalization of global transportation companies increased substantially during the last 30 years and reached a high of USD 700 billion recently. Nevertheless, global transportation as a relative share of total market capitalization, after rising to above 4% at the end of 1980s, has declined below 2% by early 2006. As a comparison, the oil and gas sector and the financial sector account for nearly 20% and 15% of global stock market capitalization, respectively. Against an estimated 8–9% of GDP in OECD countries, the low market share in capitalization indicates that transportation remains persistently neglected in international stock markets.

The shipping sector has also seen a low capitalization share, as it accounts overall for just 0.3–0.4% of global stock market value; liner shipping covers the largest share (Matthews, 2006c). Despite recent IPO activity, this figure reflects a low stock market representation for shipping, considering that the shipping sector is estimated at 2% of GDP. More specifically, the aggregate global market capitalization of public shipping companies is estimated at about USD 130 billion (following a peak of USD 180 billion in the 4th quarter 2005 and excluding cruise line figures). In the first half of 2006 alone, international shipping IPOs amounted to a value of more than USD 100

Table 6.7. Leading Shipping Stocks by Market Capitalization.

Company	Country of Listing	Market Cap (USD million)
A.P. Moller	Denmark	32.67
MISC	Malaysia	7.67
MOL	Japan	7.04
NYK	Japan	7.03
Bollore	France	5.39
Teekay	US	3.05
Cosco	China	3.03
'K' Line	Japan	2.99
Frontline	Norway	2.84
Hyundai MM	South Korea	2.53
OSG	US	2.34
OOIL	Hong Kong	2.22
Evergreen	Taiwan	1.89
Kirby	US	1.85
Bergesen Gas	Norway	1.77
Hanjin	South Korea	1.67
China Shipping	China	1.61
Torm	Denmark	1.60
NOL	Singapore	1.60
W. Wilhelmsen	Norway	1.58

Note: Figures as of end-June 2006. Cruise lines are not included in the ranking.
Source: Matthews (2006c).

billion (Matthews, 2006c). Apart from A.P. Moller, the Danish shipping giant, which accounts for about 20% (USD 32 billion) of the total market value of shipping stocks globally, no other public shipping company has a market value in excess of USD 10 billion and only 30 shipping company stocks had a market capitalization of more than USD 1 billion as of end of June 2006 (Table 6.7).

6.3.5. Recent Stock Market Performance

A risky issue in shipping IPOs has been whether shipping companies would attract investors' funding. However, as it turned out the case to be, shipping IPOs have been considered as 'fashionable', although more recent IPOs have experienced increasing investor fatigue for shipping stocks. As a result, a number of shipping IPOs failed to proceed or withdrew, as, for instance, the initial IPO effort of Aegean Maritime Petroleum or the follow-on share offering of Diana Shipping.

Table 6.8. Stock Price of Selected Shipping Companies Since IPO.

Company	IPO Date	Market	IPO Price ($)	First Day Close ($)	Price ($) 31/12/06	Return (%)
Top Tankers	23 Jul '04	NASDAQ	11.00	6.01	4.65	−57.7
Navios	6 Jan '05	NASDAQ	5.00	5.25	5.37	7.4
DryShips	3 Feb '05	NASDAQ	18.00	20.20	17.81	−1.1
Diana	18 Mar '05	NYSE	17.00	17.30	15.81	−7.0
Teekay LNG	5 May '05	NYSE	22.00	24.30	33.31	51.4
Aries Maritime	3 Jun '05	NASDAQ	12.50	12.97	9.17	−26.6
Eagle Bulk	23 Jun '05	NASDAQ	14.00	13.50	17.34	23.9
TBS International	24 Jun '05	NASDAQ	10.00	10.05	8.74	−12.6
ACL	7 Oct '05	NASDAQ	21.00	28.30	65.51	212.0
StealthGas	6 Oct '05	NASDAQ	14.50	13.70	11.68	−19.4
Quintana	15 Jul '05	NASDAQ	11.50	11.26	11.1	−3.5
Genco	22 Jul '05	NASDAQ	21.00	20.87	27.94	33.0
Seaspan	9 Aug '05	NYSE	21.00	19.42	22.71	8.1
Horizon	27 Sept '05	NYSE	10.00	10.75	26.96	169.6
Excel	15 Sep '05	NYSE	21.00	15.95	14.61	−30.4
Double Hull	13 Oct '05	NYSE	12.00	12.05	16.19	34.9
Omega Navigation	7 Apr '06	NASDAQ	17.00	16.00	15.66	−7.9
Danaos	6 Oct '06	NYSE	21.00	20.85	23.51	12.0

Note: Return refers to stock prices at 31/12/06 vs. IPO prices.
Source: NYSE; NASDAQ.

Following the unprecedented levels of freight income during 2003–2005, when demand for wet and dry bulk shipping surpassed available supply in the spot markets, shipping companies turned their financing interest into world capital markets. This robust environment was supported by high-growth rates of the Chinese economy, and to a lesser extent of the Indian economy, oil market volatility induced by Middle East political tensions, US import growth of manufactured goods and sharp increases in newbuilding prices, due to heavy orderbooks (in dry bulk, tankers as well as LNGs).

In this environment, while globally there were just four maritime IPOs, totalling USD 393 million in 2001, the number jumped to 27 IPOs, worth USD 6.07 billion in 2005 (USD 3.05 billion in US listings). Particularly during mid-2004 to end-2005, international equity markets experienced an unparalleled shipping IPO wave (Table 6.8). The IPO activity virtually started in 2004 with Top Tankers, reached a peak in 2005 with 12 shipping IPOs (a 'record year') and started slowing down in 2006. A number of shipping companies went public in this IPO wave, including Dryships, followed by International Shipping Enterprises (subsequent acquirer of

Navios), Diana Shipping, TSB International, Eagle Bulk Shipping, Horizon Lines, Aries Maritime, Teekay LNG, Quintana Maritime, Double Hull Tankers, StealthGas and Genco Shipping and Trading. Most of these companies have been listed on NASDAQ. Following 16 years of trading in the American Stock Exchange, Excel Maritime has moved to the New York Stock Exchange, targeting share liquidity and visibility boosting. Two major shipping IPOs were concluded in 2006, Omega Navigation, earlier and Danaos Shipping, subsequently. The Omega Navigation offering was a highly sophisticated IPO (in legal and investment banking terms), was registered with the securities and exchange commission (SEC) both for the US and Singapore and was dually listed in Singapore and Nasdaq with free flow of shares between the two markets. The company was structured as a master-limited partnership and, different from previous IPOs, this one offered two classes of shares with different dividend payouts. However, growing uncertainty over shipping rates on the spot market recently has resulted to declining IPO figures in 2006 (14 IPOs, worth USD 2.8 billion of which USD 1.4 billion in US listings).

It is worth noting that, in 2000, publicly listed tanker firms had a market capitalization of just USD 2.5 billion, whereas this figure is currently in excess of USD 21 billion The stock market value of firms operating bulk carriers has increased to about USD 6 billion (McGroarty, 2006a). Shipping companies listed on NASDAQ have raised about USD 1.7 billion in IPOs and USD 328 million in secondary offerings during 2005. Market participants consider 2005 to be the 'year of the shipping IPOs', as shipping companies raised funds in excess of USD 2 billion in the US, predominantly in the bulk sector.

Recent IPO performance was initially supported by robust stock price returns of the listed shipping companies. Key factors for stock performance include attractive valuation, efficient management, modern corporate governance, robust organic growth prospects and successful acquisition plans. Focusing on shipping valuation, the following critical factors should be evaluated: cash flows, NAV, revenue and operational earnings, total enterprise value and book value. However, it is questionable whether shipping stocks are going to remain attractive in declining freight markets. Post-IPO shipping stock performance indicates that, despite initially high-stock price appreciations (first trading day close price), significant downward price adjustments have taken place in some cases, as a reaction to freight market volatility (Table 6.8). The declining trends seen particularly in dry bulk stock returns have been related to moderate commodity demand in the Chinese market and a steady schedule of vessel deliveries resulting to increased total shipping capacity. Top Tankers, followed by Excel, Aries and

Table 6.9. Funds Raised in Selective Recent Shipping IPOs in NASDAQ.

Issue Name	Country	Date of IPO	Funds Raised (USD million)
Top Tankers	Greece	23 Jul '04	146.6
DryShips	Greece	3 Feb '05	234.0
Aries Maritime	Greece	3 Jun '05	153.0
Eagle Bulk	US	23 Jun '05	201.6
TBS International	Bermuda	24 Jun '05	81.6
Quintana	Greece	15 Jul '05	192.1
Genco	US	22 Jul '05	247.0
StealthGas	US	7 Oct '05	173.3
Omega Navigation	Greece	7 Apr '06	147.8
Total	–	–	1693

Source: NASDAQ.

StelthGas, appear to be major losers, as stock prices declined from −58% to −19% (IPO prices vs. 31/12/06 prices). On the other hand, American Commercial Lines (ACL) and Horizon Lines have attained spectacular returns (212% and 170%, respectively), followed by Teekay LNG, Double Hull, Genco and Eagle Bulk (returns ranging from 24% to 51%). As investors typically pick up shipping stocks at the high end of a shipping cycle, returns may not always end up as attractive as they may have been expected.

A number of shipping IPOs have been headed to NASDAQ, in order to take advantage of the benefits available in this stock market (Tables 6.8, 6.9 and 6.10). Since this is virtually an electronic platform, it is quicker than other market types and has lower transaction costs. Following the recent IPO wave, there are currently 16 marine transportation companies listed in the NASDAQ (as of end-October 2006). In a recent perception study, conducted by NASDAQ on shipping stocks as investment opportunities, the empirical findings indicated that shipping companies need to show a good growth story, good management, good strategy and fundamentals, whereas the profile of shipping companies appears to have increased among investors (Matthews, 2005).

Based on the above, and in spite of the recent shipping IPO wave, this trend may neither continue nor result to any significant increase in aggregate stock market activity worldwide, especially in Europe. Investors remain cautious with shipping stocks as some issuers appear to have on overvalued ship portfolio and unmatched with respective charter cover. Furthermore, shipping stock market performance remains directly subject to freight market

Table 6.10. Secondary Shipping Public Offerings in NASDAQ.

Issue Name	Country	Date of IPO	Funds Raised (USD million)
Martin Midstream Partners	US	28 Jan '04	32.1
Top Tankers	Greece	4 Nov '04	128.8
Eagle Bulk	US	27 Oct '05	79.8
Martin Midstream Partners	US	10 Jan '06	87.4
Total	–	–	328.0

Source: NASDAQ.

volatility. Shipping stock prices are currently at a discount of even 30–50% of earlier high levels and already reflect the declining trends in shipping markets, as spot freight rates are already down from the 2005 peak levels.

Following a three-year period of exceptional growth in freight markets that led shipowners to order new capacity, shipping business is anticipated to enter a slowdown phase and the prospects for shipping companies are gradually dimming. As a result, demand and supply imbalances are expected in the shipping markets. These developments are, in turn, going to have an impact on the stock market behaviour of the listed shipping companies. An environment of sharply downward heading shipping markets will offer the opportunity to evaluate long-term investors' attitude towards recent shipping IPOs.

6.3.6. Private Equity Funding

The positive investor sentiment seen in shipping IPOs has been driven by a combination of upward capital markets, attractive shipping freight markets, robust operating earnings and rich cash liquidity. Although an increasing number of shipping companies prefer equity markets as a flexible mean to finance shipping projects, alternative financing instruments, such as private equity, are also of interest. Private equity funding can be considered to have a complementary, yet independent, financing function to equity markets.

Following the recent slowdown in shipping IPOs, private equity firms are seen to exhibit growing interest in shipping companies, as they are searching for new industries to enter and are backed by strong capital liquidity. In contrast to other industries, the penetration of private equity funds in shipping remains at modest levels in the US, although it is anticipated to increase further. Since shipping business is an international activity, private equity firms seek to have a regionally dispersed presence worldwide. Private

equity firms offer advisory and arranger services in diversified and innovative shipping finance structures, including US finance, UK tax leases and KG finance. A core objective for private equity firms remains their support to shipping companies enhancing corporate value.

In spite of the high-risk element seen in investment returns to shipping, private equity funds have already financially supported a number of shipping companies, including Quintana, Eagle Bulk, US Shipping and Horizon, among others. Still, a growing number of private equity funds are active in raising capital to shipping finance. AMA Capital Partners, for instance, has raised a USD 100 million fund to finance marine and rail transportation projects. An earlier (2000) fund of USD 45 million, formed jointly with fund partners NIB Capital and GATX, was used to acquire ships attaining a net IRR for shareholders of over 20% (Matthews, 2005).

A number of US private equity firms, such as Carlyle, Wexford Capital, Castle Harlan, Stockwell Fund, Blackstone Group, Lehman Brothers and Sterling Investment Partners, have been involved in shipping finance. Navigation Finance Corporation (NFC), for instance, a joint venture between DVB Bank and Northern Navigation, has entered into a USD 181 million sale and lease-back deal with Singapore based offshore vessel operator Ezra Holdings. NFC has closed five funds over six years, totalling about USD 300 million. A sixth fund targets, currently, fund raising of about USD 150 million, whereas each fund is diversified funded by institutional investors (McGroarty, 2006a).

In another deal, Castle Harlan gradually liquidated a stake in Horizon Lines to 18.5% from 37%, selling 5.3 million of Horizon Lines outstanding shares. On the other hand, Fidelity Management has increased its stake in Horizon Lines from 8% to 11.3%, worth about USD 61.5 million. Furthermore, US Shipping Partners has formed a joint venture (US Product Carriers), which has commitments totalling USD 105.5 million in private equity from the Blackstone Group and Leman Brothers (McGroarty, 2006a). Having said that, private equity funds in the US market, armed with high liquidity, turn their attention mainly to larger leveraged buy-out (LBO) deals. Supported by high-vessel values, past returns on related deals have been exceptional at 30%.

Part of the increasing attention paid to private equity finance relates to the fact that investors are better informed and more diligent on fund investing relative to IPO investors. As investors' interest in listed shipping stocks is expected to slowdown and shipping companies become more experienced in the use of capital markets, private equity funds can take advantage of new financing opportunities.

6.3.7. Corporate Governance

The recent shipping IPO wave in international capital markets brings about fundamental shifts in the managerial model of the companies involved. As traditionally family-owned shipping companies expand their shareholder base and turn into publicly listed entities, a gradual separation of ownership and management takes place. These shifts are partly induced by the institutional framework of the host capital markets, particularly the US (Sarbanes-Oxley, SOX Act, 2002). Publicly listed companies must conform to a set of strict obligations, including detailed disclosure procedures, information dissemination, transparency towards market participants and best practices in corporate governance (e.g. Randoy, Down, & Jenssen, 2003).

According to the OECD framework, corporate governance is the system by which business corporations are directed and controlled. The corporate governance structure specifies the distribution of rights and responsibilities among different participants in the corporation, such as the board, managers, shareholders and other stakeholders, and spells out the rules and procedures for making decisions on corporate affairs. Based on that, a broad perspective of corporate governance covers company relationships with its stakeholders. In a narrower perspective, corporate governance focuses on management–shareholder relationships, agency conflicts and associated shareholder value implications.

Corporate governance can be disaggregated in the following main pillars: ownership structure and influence of major stakeholders, shareholder' rights, transparency – disclosure and audit and board effectiveness. A key issue in establishing a sound corporate governance system is the independence of the Board of Directors which is further related to responsibility and accountability. In addition to management monitoring, the Board performs a number of specific functions including selection, evaluation and development of senior management; reviewing and monitoring of fundamental corporate strategies; ensuring maintenance of company integrity with the stakeholders. Empirical evidence indicates that sound corporate governance mechanisms can have a positive impact on corporate value and shareholder wealth (Syriopoulos & Theotokas, 2007).

Corporate governance structures affect corporate value through two distinct channels: (i) the expected cash flows accruing to investors and (ii) the cost of capital, i.e. the expected rate of return. An efficient corporate governance structure is expected to exhibit positive correlation with improved operating performance, higher stock price and higher firm

valuation. Firms with weak corporate governance mechanisms appear to be less effective in attaining robust financial results and ensuring value maximization. Poor financial performance, in turn, increases considerably the risk of hostile takeover bids (Panayides & Gong, 2002; Syriopoulos & Theotokas, 2007). Moreover, in the absence of corporate governance controls, the interests of managers versus those of shareholders are more likely to diverge (agency conflict problem).

6.4. SHIPPING BONDS AND HIGH-YIELD RISKS

6.4.1. Shipping High-Yield Bond Market

The issue of bonds as an alternative instrument to funding shipping investments has certain merits but is also associated with risks. Traditionally, financing shipping projects with bond issuing has not been a prime choice for shipowners, as low interest rates have supported banking finance and IPOs have attracted considerable funding in the international capital markets. This section overviews the high-yield bond market for shipping companies, as this capital market segment experiences some revitalized activity.

The high-yield bond market has attracted the interest of shipping companies recently. The first high-yield bond in shipping was issued in 1992 by Sea Containers, targeting an amount of USD 125 million in subordinated debentures. During 1992–2005, more than 60 shipping issues have taken place in the US high-yield bond market (Table 6.11). Total funds in this speculative grade bond segment have come up to USD 10.1 billion with an average coupon of 9.73% and an average term to maturity of 9.5 years (Nomikos & Papapostolou, 2006). The years 1993 (9 issues), 1997 (9 issues), 1998 (17 issues), 2003 (10 issues) and 2004 (5 issues) have shown intensive activity in shipping bonds. This translates to a total of 50 shipping high-yield bonds and corresponds to 82% of the overall issues during 1992–2005. During 2003–2005 alone, 16 new shipping bond issues have come into play. This is a robust indication of the revitalized interest that shipping companies show in the bond market as a financing source to their capital-intensive investments. Reasons justifying these exceptional years include the relatively modest interest rate levels (1993), replacement of ageing fleets backed with high gearing (1998) and a strongly positive performance in shipping and bond markets (2003–2005).

Cyclicality, volatility and high leverage may jeopardize shipping companies' expected cash flows, especially at recession periods. These conditions can further result to deterioration of corporate credit quality and increase the

Table 6.11. Shipping High-Yield Bonds.

Year	Number of Issues	Total Float (USD million)	Average Float (USD million)	Average Coupon (%)	Average Term (years)	S&P Average Rating
1992	1	125	125	12.50	12.00	BB−
1993	9	1235	137.2	9.13	10.77	BB
1994	1	175	175	11.25	10.00	BB+
1995	1	175	175	10.50	10.00	BB
1996	3	490	163.3	9.61	9.61	BB−
1997	9	1190	132.2	10.39	8.44	B+
1998	17	2738	161.1	10.11	9.41	B+
1999	1	115	115	10.75	7.00	BB−
2000	0	–	–	–	–	–
2001	1	250	250	8.80	10.00	BB−
2002	2	400	200	10.00	10.00	BB
2003	10	2196.6	219.6	9.18	8.50	BB−
2004	5	843	168.6	8.35	12.00	BB−
2005	1	200	200	9.50	10.00	B−
Total	61	10,132.6	166.1	9.72	9.53	BB−

Source: Adapted from Nomikos and Papapostolou (2006).

probability of default. Financial crises and economic shocks exert a critical adverse impact on the shipping markets, as did, particularly, the Asian financial crisis and the Russian economic upheaval, during 1997–1998. Deterioration in international terms of trade affects mostly the shipping companies exposed in high gearing and operating mainly in the spot market, leading to problematic servicing of high debt.

In the past, depressed market conditions have hit shipping markets and led to dramatic declines in freight rates and vessel prices in most market segments. As a consequence, several shipping companies proceeded to default on their high-yield bond issues. Based on Nomikos and Papapostolou (2006), in 1999, 10 shipping companies defaulted on their high-yield debt. The shipping public debt default rate by issuer in 1999 was around 38% against a corresponding figure of 1.28% for the overall public debt default rate. Though shipping industry issuers represented less than 0.5% of the overall public debt by issuer outstanding as of January 2000, total shipping industry defaults reached nearly 9% of all defaults by issuer for 1999.

Past empirical research on shipping debt and high-yield bonds remains surprisingly thin. A recent exception is Grammenos and Arkoulis (2003), who examine significant determinants affecting primary pricing of new shipping

high-yield bond offerings in the US, during 1993–1998. Based on the empirical approach of Fridson and Garman (1998), the study investigates the impact of key factors on shipping high-yield bond spreads, such as rating, callability, term (years to maturity), float (issue amount), default rate, security, gearing, fleet age, laid-up tonnage and 144a status. Primary pricing refers to the determination of spread of the new high-yield bond offerings. The spread is defined as the difference between the yield to maturity on a coupon-paying corporate bond and the yield to maturity on a coupon-paying government bond of the same maturity.

6.4.2. Credit Rating

One of the bond market distinctions refers to the primary and secondary bond markets. The primary bond market is the market where a new bond issue is initially offered to investors for the first time. The secondary market, on the other hand, refers to the market where a bond issue, following its initial offering (in the primary market), is already traded and its price is driven by demand and supply forces. However, as liquidity in shipping bond issues has proven to be historically low in the secondary market and trading in large sums has been difficult, shipping companies rely predominantly on the primary market.

Rating is considered to be the most important factor in the pricing of high-yield bonds and significant correlation has been detected between rating and high-yield bond spreads (Fridson & Garman, 1998). Bonds are rated either as of investment or non-investment grade (termed 'high-yield' or 'junk' bonds). This distinction is based on the credit ratings these bonds receive from US rating agencies, such as Moody's, Standard and Poor's (S&P's), Fitch and Duff & Phelps. Bonds rated in the range of Aaa/AAA (Moody's/S&P's) to Baa/BBB (Moody's/S&P's) are considered as 'investment grade'. Any bonds rated B (Moody's/S&P's) or below are included in the 'high-yield' class (Table 6.12). Adjustments can be made within a rating category by adding a + or − (Moody's) or 1, 2 and 3 (S&P's) to indicate a higher or lower issue in its class. Major factors that credit rating agencies take into account when they evaluate a shipping issue include sovereign/macroeconomic issues, industry outlook, management quality, operating position, financial position, company structure and issue structure (Nomikos & Papapostolou, 2006).

Market participants pay particular attention to rating as a key factor affecting spreads and bond value. Since rating indicates competitive credit risk of any two investments within the group of rated instruments, rating

Table 6.12. Bond Rating Standards.

Moody's	S&P's	Characteristics	Comment	Class
Aaa	AAA	Highest grade	Maximum safety	Investment Grade
Aa	AA	High grade	Slightly lower standards	
A	A	Upper medium	Favourable but possible future problems	
Baa	BBB	Medium grade	Moderate security and protection	
Ba	BB	Moderate protection	Contain speculative elements	Speculative
B	B	Potentially undesirable	Low assurance of future payments	'High-Yield'
Caa	CCC	Danger of default	Dangerous elements present	or 'Junk' Bonds
Ca	CC	Likely in or to default	Highly speculative	
CC	C	Lowest class	Extremely poor prospects	
C	D	Bottom most grade	Unlikely to attain any standing	
NR	NR	Not ranked	No evaluation available	

Source: Adapted from Fabozzi (2005).

also can support forecasts of probability of default. It is considered as an indicator of investors' protection in case a bond issuer faces adverse long-term economic conditions. In the specific context of shipping business, rating of shipping bonds takes into account a number of issues, including the impact of cyclicality and volatility on shipping markets, the uncertainty about the future direction of freight rates, the shipping business allocation into spot or chartered markets, the ability of the issuing shipping companies to attain sustainable future cash flows and the issuer's vulnerability to economic cycles and the implications for interest and principal payment.

In this framework, Grammenos and Arkoulis (2003) conclude that rating is a prime factor that potentially affects shipping bond pricing and plays a key role in setting bond spreads. Lower rated issues are associated with higher default probabilities. Hence, one would anticipate a positive relationship between rating and the spreads on new shipping high-yield bond issues. Callability of a shipping bond implies that the issue has a call option embedded and the issuer retains the right to retire (call back) the bond at specified prices before maturity. This option is of value in case of lower interest rate expectations, since the issuer may have the opportunity to refinance debt with a lower interest rate instrument, thus improving company debt terms. However, investors are exposed to reinvestment risk; hence, they would target higher returns for that. Primary pricing may be affected by the maturity term of a bond and a negative relationship between maturity and spread is anticipated. The float (issue amount) of a shipping

bond indicates the liquidity of the issue. Larger bond issues are expected to have lower risk premiums than smaller bond issues traded in thinner markets. Hence, an inverse relationship is anticipated between float and spread (smaller issues – larger spreads).

The default rate is a measure of credit risk in the high-yield bond markets and reflects relative likelihood that there may be a difference between what investors were promised and what the actually receive by the bond issuer. That is, a default implies any missed or delayed disbursement of interest or principal. It includes, furthermore, 'forced exchange', in case a bond issuer has offered a new instrument containing a diminished financial obligation, such as preferred or common stock or debt with a lower coupon or par amount (Fabozzi, 2005). Since higher default rates are associated with higher risk premium and investors demand a higher spread for compensation, a positive relationship between default rate and spreads would be plausible. The spread is also affected by subordination (in terms of debt claims priority) and is related to whether debt is secured (collateralized by assets) or unsecured; unsecured bond issues are expected to carry wider spreads.

Gearing has critical financial implications for shipping companies and is affected by high swings in freight rates and vessel prices. In periods of market growth, cash flow capacity may suffice to cover investment needs; however, in recession periods, external financing may be necessary. Shipping bonds issued by highly geared companies are associated with wider spreads. The fleet age can also be an important factor, since it affects the vessel value. New vessels are usually more expensive and companies with younger fleet are seen to perform better in the capital markets. Nevertheless, in strongly upward markets and tight demand conditions, vessels can earn similar freight rates regardless of their age factor. High-yield bonds issued by companies with an older fleet (higher running costs) are associated with wider spread (higher risk). Finally, since larger laid-up tonnage reflects weakening demand interest and deteriorating industry conditions, the larger this factor the wider the associated high-yield bond spreads. Of the previous factors analyzed, rating predominantly but also gearing and laid-up tonnage appear to be statistically significant in explaining shipping high-yield bond spreads (Grammenos & Arkoulis, 2003).

6.4.3. Probability of Default

A recent empirical study assesses risks in a sample of 50 shipping high-yield bonds that were issued in the period 1992–2004 (Nomikos & Papapostolou,

Table 6.13. Shipping High-Yield Bond Ratings.

	All Issues	Defaulted Issues		Non-Defaulted Issues	
	Number	Number	% of group	Number	% of group
BB+	4	0	0	4	100
BB	5	1	20	4	80
BB−	25	2	8	23	92
Total	34	3	8.8	31	91.2
B+	6	3	50	3	50
B	8	5	62.5	3	37.5
B−	1	1	100	0	0
Total	15	9	53.3	6	46.7
CCC+	1	1	100	0	0
All Issues	50	13	24	37	76

Source: Adapted from Nomikos and Papapostolou (2006).

2006). Of these bonds, 13 issues have been defaulted as of the end of 2004 and the remaining 37 issues were still trading in the market or had expired. Their corresponding credit ratings and the categorization in defaulted and non-defaulted issues are summarized above (Table 6.13). Most of the new shipping high-yield bonds were assigned a credit rating falling into the BB level (68% of the sample); few issues were rated at the B level (30%) and one issue at the C level (2%). Of this sample, 8.82% of the BB-rated bonds defaulted compared to 53.30% of the B-rated bonds. This outcome implies that investors who prefer higher-rated shipping bonds in a shipping bond portfolio stand on average a lower probability of default. This, however, is not necessarily the case on an individual bond basis.

The study investigates and statistically tests the explanatory power of critical factors in best predicting the probability of default of shipping high-yield bonds at the time of issuance. A number of financial, industry and issue-specific variables are considered, including: issue amount raised to total assets (issue factors), current assets to current liabilities (current ratio), cash to freight revenue (liquidity indicators) and pre-issue gearing as a debt indicator (financial factors) and laid-up tonnage to total fleet (industry factors). Shipping companies with low liquidity (current ratio), high-gearing levels and operating in the spot market are anticipated to have difficulties in meeting short-term obligations to their bondholders. The lower the liquidity

indicators of a shipping company the higher the probability of default for its high-yield bonds, particularly in adverse shipping market conditions.

The gearing level is a most important factor for the probability of default. Pre-issue gearing is calculated as the ratio of long-term debt over long-term debt plus shareholder equity. A higher exposure to debt indicates higher vulnerability of the shipping company during recession phases and higher risk for bondholders due to higher probability of default. These negative conditions have jeopardized the viability of several shipping companies in previous years, whereas a number of high-yield bond issues have defaulted, as in 1998–1999. A substantially large amount raised in the high-yield bond issue over the company's total assets indicates a higher risk exposure for bondholders; hence, a higher probability of default. High laid-up tonnage over total fleet indicates weak demand and depressed market conditions, which in turn increases the probability of default for shipping bonds.

As Leggate (2000) anticipates, inter alia, the shipping industry will face considerable capital requirements over the next decade as a result of increasing trade flows and ageing fleets. This growth in demand will be in contrast to a potential contraction in the number of banks willing to support the industry and a general tightening of credit facilities. As a result, shipping companies must consider accessing the capital markets for equity and debt. The difficulties experienced particularly in the bond markets have lead to an early dismissal of this relatively new form of finance. Bond finance remains largely dependent on the perception of the shipping industry by the investment community.

6.5. SECURITIZATION IN SHIPPING

6.5.1. Concept and Structure

Securitization is a sophisticated and dynamic instrument for shipping finance that has considerable potential for further development. In principle, securitization refers to the use of a stream of income and/or a portfolio of assets to back the issue of securities, which is usually debt but also equity in some cases. The appealing but complicated part of this instrument lies in the packaging of the cash flow streams and asset portfolios and in the structuring of the various tranches of securities which are to be issued in a deal. More specifically, asset securitization involves the pooling and re-packaging of assets (or loans) and receivables (each of which individually may be of sub-investment grade quality), in such a way that the whole

relatively homogeneous asset package can support multi-tranche issues of liquid securities, including a substantial top slice of investment grade paper (Stokes, 1997).

Hence, securitization can be constructed in three broad stages:

- creation of a homogeneous pool of assets,
- provision of third-party protection against credit, liquidity, basis and reinvestment risk,
- structuring of a security whose interest and principal payments are supported by cash flows arising from the underlying asset pool.

This type of financing was earlier provided by a single lending institution that would write the loan, structure the terms, absorb the credit and interest rate risk, provide the capital and service the collections. More recently, different parties are involved in securitization finance and they bear different functional roles. Overall, the process of securitization has lower costs, increases the availability of funds to borrowers, decreases risk to lenders and creates new investment opportunities to investors (Brigham & Ehrhardt, 2004).

The asset backed securities (ABS) market is rapidly becoming a dynamic part of the global capital markets (Figs. 6.2 and 6.3). The US ABS issuances reached record levels in 2005 (+26% relative to 2004), at USD 1.1 trillion (from USD 873 billion, in 2004). According to Thomson Financial, in

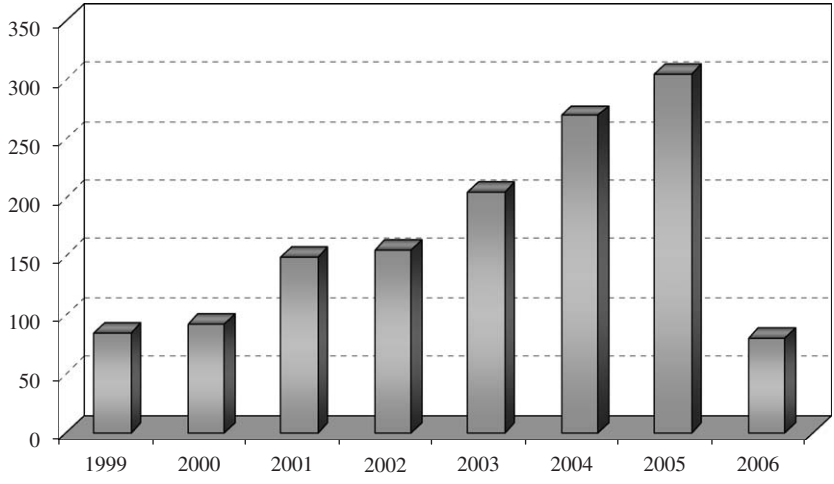

Fig. 6.2. European ABS Market (May 2006). *Source:* Adapted from JP Morgan Research (2006).

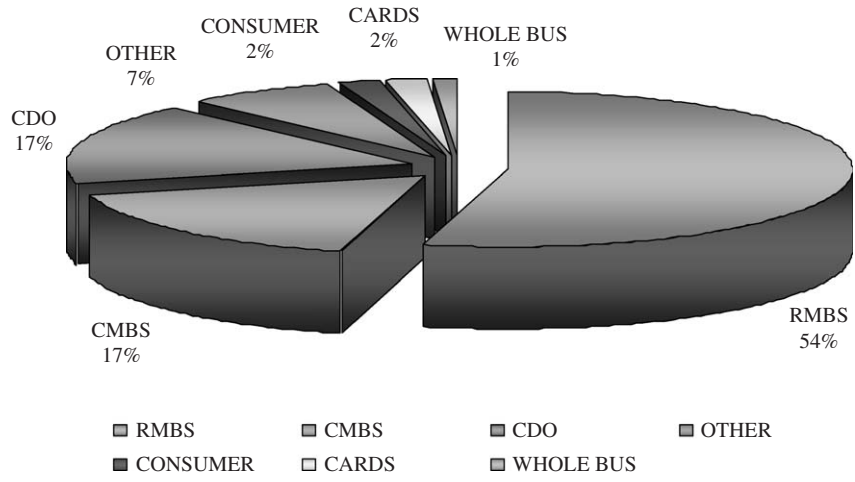

Fig. 6.3. European ABS Market by Asset Class (May 2006). *Source:* Adapted from JP Morgan Research (2006).

Europe, the UK is the ABS leader with 50% of issuances of a total current figure at USD 72.3 billion (JP Morgan Research, 2006).

A securitization structure involves the following key parties:

- *Originator(s)* (usually a bank): sets interest rates on the loan portfolio ('Reference Portfolio', RP); creates a pool of assets and sells to a 'Special Purpose Vehicle' (SPV); continues to deal post-sale with the borrower; conducts arrears and default procedures on behalf of the SPV.
- *Special Purpose Vehicle* (SPV): a single purpose corporation (legal entity) established to acquire the underlying assets from originator(s); to fund purchase through the issue of notes secured on the SPV's assets
- *Trustee*: safeguards investors' interests by holding all securities and by monitoring the performance of the parties involved to the various agreements.

Securitization can apply in two main variants, namely: (1) cash securitization, distincted into the traditional type (Fig. 6.4) and the recycled credit type and (2) synthetic securitization. Cash securitization applies in cases when there is a transfer of the RP to the SPV against cash. The SPV finances the purchase of the RP by issuing rated bonds. Synthetic securitization applies in cases when a premium payment to the SPV takes

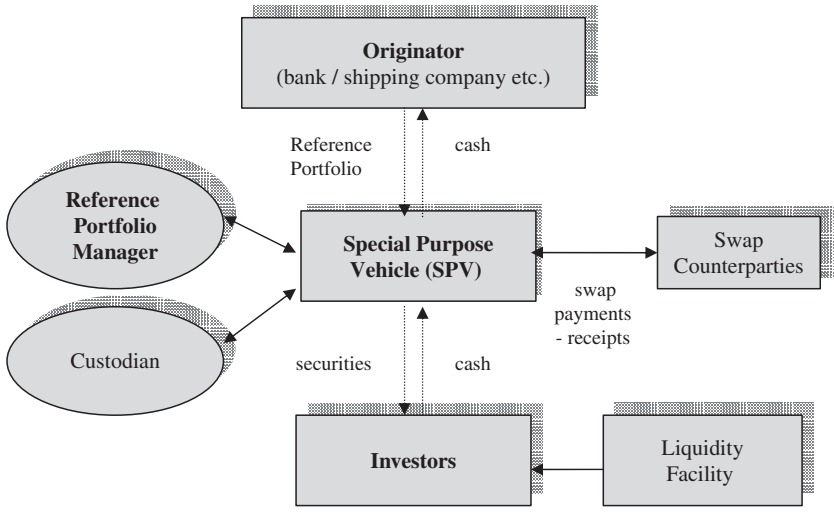

Fig. 6.4. Traditional Cash Securitization.

place for the latter undertaking the credit risk of the RP. The SPV issues bonds linked with the credit risk of the RP or proceeds to credit risk swaps (credit-linked notes, credit default swaps) with specialized counterparties.

As mentioned earlier, in securitizations the issuing company (bank) constructs a 'reference portfolio' which is then rated. However, according to the framework set in Basel II Accord, banks can get economic capital relief when loans are placed into a qualifying securitization structure, meaning that banks may exclude risk exposure from calculations of economic capital, if a portfolio has been securitized. In the case of shipping, portfolio risk remains a rating constraint, due to high volatility in ship values and charter rates. This implies a shift towards rated transactions, as capital charges in unrated transactions are anticipated to rise, although the underlying asset classes and portfolio risk profile remain key factors.

Securitization in shipping is attractive to investors who are interested in direct investment in vessels and can benefit in case vessel values appreciate. Related dividend yields are estimated to potentially range from 9% to 15% (McGroarty, 2006b). A number of implications are triggered for the company that proceeds to securitization, including:

- efficient risk management as credit risk is transferred to investors,
- improvement in capital adequacy ratios, solvency ratios and borrowing capacity,

- enhancement of the company's liquidity,
- financing of alternative high-return investments,
- efficient and low-cost financing mechanism.

A core issue for securitization is that the whole procedure sets up a funding mechanism where the asset can fund itself. On the other hand, securitization involves certain transaction costs, limits flexibility in securitized assets and bears certain level of risk, in case the securitization vehicle cannot reinvest in new fleet as existing vessels age. Apart from market risk, investors assume vessel operating risks and credit risk of lessees. The securitization funding costs are dependent on the following factors: spread payable on the bonds, underwriting and management fees, legal framework, rating agency costs and other third-party fees and on-going fees and expenses.

6.5.2. Securitization Cases in Shipping

Securitization was initiated in the US mortgage (asset-backed) market and only recently was it introduced in shipping financing. Securitization in shipping can, indicatively, apply to a shipping company that employs a diverse portfolio of modern vessels fixed on a medium-to-long-term bareboat charter to operators with a first-class technical record but probably to a less than top credit rating (Stokes, 1997). The rating of the various tranches of debt supported by such a portfolio would then depend on the level and quality of the combined income stream, the diversification of risk through the variety of ship types and lessees and the assessment of potential minimum residual value upon expiry of the bareboat charters.

This type of finance has been successfully applied to the aircraft lease sector in the aircraft lease portfolio securitization (ALPS) deals. A first substantial securitization transaction in shipping is historically considered to be the USD 235 million mortgage note issued by First International Petroleum Transport Corporation (FIPTC), in 1994 (Stokes, 1997). A similarly structured note was issued to refinance four Suezmax tankers for Chevron, in 1995. However, whereas the FIPTC case was a financing instrument for newbuildings, the Chevron case was structured as a sale and lease-back of existing vessels.

A significant corporate development in 2006 has been the first international publicly rated shipping securitization led by BNP Paribas with a fleet of vessels for CMA/CGM, third largest containership operator worldwide. More specifically, in the Container Vessel 2006-1 corporate asset backed securitization, CMA/CGM raised 100% of the USD 800 million

contract value of 12 newbuilding containerships against their bareboat charter (McGroarty, 2006b). This transaction involved a single-rated credit (CMA/CGM), single-vessel type (containerships) and single-market segment (containers). The transaction was split into three stratified risk positions: (i) USD 250 million in senior notes issued in the ABS capital markets, with a spread of about 30 bps, rated as AAA; (ii) USD 280 million mezzanine tranche provided by a bank syndicate, with a spread of about 70 bps, rated Ba2/BBB- and (iii) subordinated notes purchased by CMA CGM using the proceeds of a corporate bond at a total fixed rate of 7.25%. This structure led to an average spread of the whole package less than 100 bps whereas costs were high at about 2.3%.

This case is anticipated to turn shipping companies' attention to exploring securitization as an alternative approach to financing. A limited number of companies, such as OSG Shipholding Group, have already employed successfully securitization transactions to their advantage. OSG has packaged and sold oil company receivables from the Alaska trade in 1999, well in advance of European banks. OSG, more specifically, securitized a group of ship charters, implying securitization of future cash flows under the ship charters and attained cheap financing, since the charter party was AA rated. RCL followed in 2001 by setting Cruise Ship Finance as a SPV to securitize instalment payments of USD 590 million for the delivery of cruise ships under construction for Royal Caribbean.

Quoting McGroarty (2006b), a recent term debt securitization refers to sea containers and involves, first, the refinancing of USD 106.9 million principal amount of its senior notes that were issued in the 'special purpose company' (SPC) 2001 securitization and second, the issuance of new 2006 senior notes by the SPC with an initial principal amount of USD 53.7 million, at a Libor plus 5.25% rate; the cash proceeds are to be used for working capital purposes.

In the synthetic securitization front, recent cases include HSH's Ocean Star 2004 plc., Ocean Star 2005 plc. and NIBC's Latitude Synthetic I BV. These three schemes were based on the securitization of a pool of shipping loans with multiple unrated credits and vessels types in various sectors (oil product tankers, dry vessels, containers). However, the objective of the transaction was to transfer risk of ownership to the capital markets rather than raise cash, since the motivation for the issuers (HSH Nordbank and NIB Capital Bank) was to reduce the amount of regulatory risk capital they had allocated against these loans.

As shipping portfolios are growing, market liquidity remains rich and banks pay increasing attention to efficient risk management, shipping

securitizations may continue to present an interesting source of financing. Nevertheless, since shipping appears to have been treated with rather modest popularity in international capital markets, the instrument of securitization may attract the attention of the more specialized investors in the business. Since shipping is an asset-based business, securitization has potential for further growth into diversified directions, including trade receivables, charter receivables, lease receivables, loan receivables inventory to assets with predictable future and liquid-market value (McGroarty, 2006b). Furthermore, a securitization market for ship leases can develop further, subsequent to the Pacific Shipping Trust case.

Taking advantage of securitization, shipping companies can proceed to reduce borrowing costs through the employment of a securitization vehicle. Moreover shipowners can transfer risk of credit loss and future vessel valuation (residual risk) to external investors. Overall, securitization markets are anticipated to experience further growing trends in the US (e.g. Seaspan) and particularly in Asia (e.g. Pacific Shipping Trust), as an alternative funding source for larger shipping companies and, at the same time, provide an exit strategy for private equity investors (McGroarty, 2006a).

6.6. RISK MANAGEMENT AND FFAS

6.6.1. Volatility and Risk in Shipping Markets

Shipping markets consistently exhibit highly cyclical and volatile behaviour that has been an issue of great concern for shipowners, charterers and investors. To elaborate, the dry bulk index on the Baltic Exchange (the benchmark for commodities such as coal, iron ore, grains and steel) fell 70% from December 2004 to August 2005, before subsequently bounce back nearly 80%. To this end, alternative risk management approaches have been proposed, in order to mitigate business risk in the shipping markets (e.g. Nomikos & Alizadeh, 2002). A limited body of past research investigates certain aspects of shipping market volatility, including more recently, Jia and Adland (2002), Tvedt (2003), Kavussanos *et al*. (2003), Chen and Wang (2004), Syriopoulos and Roumpis (2006) and Syriopoulos, Merikas, and Roumpis (2006).

Past studies have followed a market or even a route-disaggregated approach to investigate volatility behaviour in dry bulk, tanker and container market segments. The empirical findings have indicated that shipowners can diversify business risks by holding portfolios of ships of different size,

switching between contracts of different duration and hedging with forward freight contracts; vessels of small and medium size were found to show relatively lower volatility compared with larger-size vessels. Furthermore, the impact of trading volume (activity) on vessel price changes has been examined, since trading volume can contribute useful information in a market where real assets are traded.

Syriopoulos and Roumpis (2006) expand on Alizadeh and Nomikos (2003) and investigate the relationship between trading volume, prices and return volatility in different second-hand dry bulk and tanker market segments. The objective was to gain fruitful insight on the sale and purchase market dynamics and the sensitivity of vessel price movements following the arrival of new information signals in the shipping markets. Contemporaneous relationships were identified between returns and volume particularly in the markets of handy size and panamax bulks as well as of handy size and aframax tankers. Price changes were found to have an impact on trading volume indicating that expectations to higher capital gains induce increases in trading activity. Volume appears to have a negative impact on the volatility of price changes mainly in the dry bulk market; this may be due to thin trading, limited transaction transparency and absence of vessel price quotes. The empirical findings can contribute to a better understanding of shipping markets' microstructure and price volatility dynamics by market participants. This, in turn, can be useful for investors who construct their portfolios of real assets with a view to attain superior capital gains, controlling for the underlying investment risk.

Mulligan and Lombardo (2004) examine the fractal properties in a sample of shipping equity prices and test for behavioural stability and efficient market pricing. Evidence of a change in market behaviour between 1989–1994 and 1995–2002 was detected. Furthermore, tests statistics indicated evidence against efficient valuation of the shipping business, supporting the multifractal model of asset returns and disconfirming the weak form of the Efficient Market Hypothesis. Market participants were found to habitually overreact to new information and never learn not to. These issues imply that financial derivatives, based on the sampled equities, cannot be efficiently priced.

The estimation of risk has implications for the required rate of return on capital and investment appraisal. Gong (2003) argues that, despite the fact that shipping is regarded as highly risky business, it displays a systematic risk level that is close to the market average; similar conclusions hold also for the airline business. There is also evidence to suggest that the beta coefficient of risk (produced by CAPM) on individual shipping (and airline) stocks appear to be unstable over time.

Since the various shipping market segments exhibit differing behaviour (associated with critical factors such as freight rate fluctuations, vessel size class and operational flexibility), their risk–return profile is also divergent (e.g. Kavussanos, 1997, 2003). Moreover, different asset classes in the same shipping market segment (handymax, panamax, capesize in dry cargo; aframax, suezmax, VLCCs in tanker) show different volatility patterns and the same holds in relation to the contract type (spot vs. time-charters; Kavussanos, 2002). These issues are of importance to market participants, as their implications can affect asset values and returns, trading strategies and investment decisions. To illustrate these arguments, one can compare the relative volatility seen in different types of newbuilding and second-hand vessels as well as scrap prices and earnings for the dry bulk and tanker sectors (Table 6.14).

The substantial risks for market participants implied by the volatile nature of shipping business can be broadly classified into (Kavussanos & Visvikis, 2006): (1) *business risk*, related to fluctuations in earnings and affected mainly by freight rates, voyage costs, operating costs and exchange rates; (2) *liquidity risk*, referring to the ability of a shipping company to sell its assets on short notice at market prices; (3) *default risk*, representing the ability of a company to service its debt (interest and principal payments); (4) *financial risk*, depending on the financial structure of the company (leverage) and interest rate shifts; (5) *credit risk*, induced by transactions with a counterparty (such as time-charter, forward agreement, loan); (6) *market risk*, related to key factor

Table 6.14. Risk Profile in Dry Bulk and Tanker Vessels.

	Mean	Relative Volatility	Mean	Relative Volatility	Mean	Relative Volatility
Dry Bulk Vessels	Capesize		Panamax		Handy	
Earnings	19,684	75	11,388	65	10,789	54
Newbuilding prices	35.74	20	26,42	16	23.00	14
Second-hand prices	30.29	35	20.57	28	17.95	22
Scrap prices	3.60	40	2.30	37	1.33	25
Tanker Vessels	VLCC		Suezmax		Aframax	
Earnings	33,770	68	24,750	67	21,456	58
Newbuilding prices	82.67	18	54.15	15	42.55	12
Second-hand prices	62.15	21	41.53	20	33.52	18
Scrap prices	6.32	38	4.53	35	3.21	35

Note: Figures as of January 1990–March 2005.
Source: Adapted from Kavussanos & Visvikis (2006).

shifts in the market where the company operates and, also to stock market risk in case the company is listed in a stock exchange; (7) *political risk*, as shipping business is sensitive to political decisions, events and crises and (8) *technical and physical risk*, related to vessel deficiencies (damage or loss) and affecting company earnings and reputation.

The volatility in shipping and the associated high risk has led market participants turn their attention to financial instruments to hedge against underlying risks. Similar to financial markets, market participants in shipping can use derivative products, particularly FFAs, to mitigate risks. In a different perspective to FFAs, real option analysis (ROA) has, more recently, been argued to offer support in risk diversification, especially when the operator is required to make strategic planning decisions in boom or bust environments (e.g. Bendall & Stent, 2003). Based on ROA, management can respond flexibly to new information that affects strategic investment decisions and avoid limitations that standard capital budgeting techniques, such as net present value (NPV), suffer from.

6.6.2. The Development of the FFA Market

Since freight rates critically affect corporate earnings, shipping companies are in need of efficient hedging instruments against operational and other risks. Broadly, freight derivative contracts can be used for business decisions that include: risk management through hedging; investment and speculation; spread play; portfolio switching; portfolio management of existing time-charters; early access to newbuildings; a more flexible alternative to time-chartering; collateral against a bank loan; price discovery; and focus on specific market segments (Kavussanos & Visvikis, 2006).

The fact that the FFAs can contribute to risk control has resulted to these derivative products exhibiting robust growth rates over recent years. A number of shipowners, such as Cosco and Oldendorff, are very active in FFA trading at high volumes. Other shipping companies, such as IMC, Klaveness, Western Bulk and Navios, have established their own in-house FFA departments (Matthews, 2006b). Following their customers trends, a number of banks, including Royal Bank of Scotland, DVB and ABN Amro, have also entered the FFA market more recently. The empirical findings in a recent survey (Jagani & Thabel, 2005) indicated that the main reasons shipping companies use freight derivatives are for hedging of physical cargoes (42%), hedging and speculation (42%), financial tool and speculation (8%) and speculation only (8%).

Based on Clarkson's estimates, traded volumes in the freight derivatives market have grown sharply and have more than quadrupled since 2001, albeit following a bumpy path. Despite the fact that, in the second half of 2005, the FFA market experienced a relative slowdown compared with the sharply upward growth trends seen in 2003 and 2004 (Fig. 6.5), the structural changes seen in freight markets still indicate robust long-term growth potential. The derivatives market slowdown seen in 2005 was partly due to the sharp change in shipping markets' sentiment and was apparent in both the lots traded and the total value for tankers as well as dry bulk. The value of the dry bulk and tanker derivative markets fell from about USD 25 billion and USD 8.4 billion (2004) to around USD 20 billion and USD 6.4 billion (2005), respectively (Matthews, 2006b). Compared to the size of the underlying physical markets and other derivative markets, these figures remain at low levels.

In spite of the FFA advantages in hedging freight risk, a number of financial institutions, shipping companies and trading companies still express some concern over their limited liquidity. Liquidity refers to the easy entry in and exit out of a significant position and is an essential characteristic for any capital market to be attractive. Liquidity is, furthermore, related to: (i) time required for a trade to be executed and (ii) price distortion, reflecting the extent a trade affects underlying prices (Harris, 2002). Certain questions arise, however, as to the most appropriate liquidity measure, its time frequency basis and the quantity to be measured. A critical issue remains information dissemination to market participants and a flexible mechanism enabling the publication of independently produced liquidity figures. Imarex remains the only broker that publicly

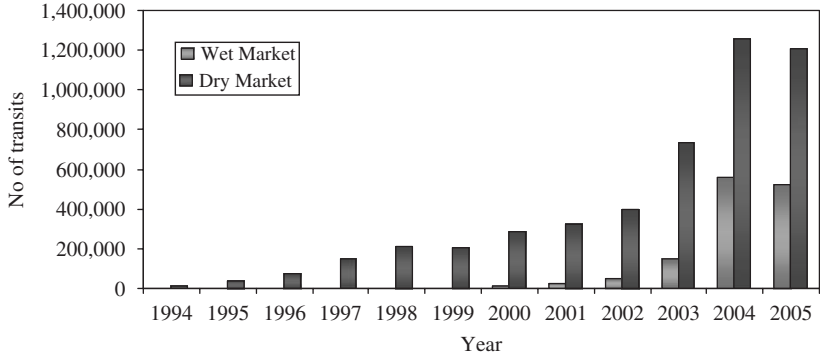

Fig. 6.5. Number of Lots Traded in FFA Market. *Source:* Adapted from Macqueen (2006).

Table 6.15. Imarex FFA Trade Figures.

Imarex Trade Statistics	Tankers	Dry Bulk	Total
Transactions	337	41	378
Lots (1 lot = 1000 MT or 1 day)	11,826	6021	17,847
Nominal Trade Value	USD 114.5 million	USD 88.6 million	USD 233.1 million
Average Lots/Trades	33	144	–
Average Nominal Value/Trade	USD 384,715	USD 2,215,844	–

Note: Figures as of July 2005.
Source: Adapted from Aury and Steen (2005).

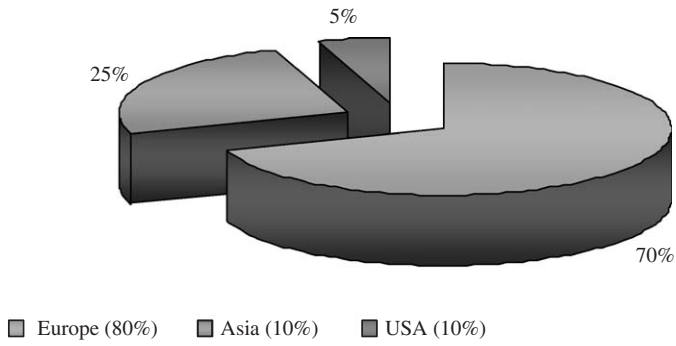

Fig. 6.6. Geographic Shift in FFA Activity 2006 (vs. 2004). *Source:* Adapted from Macqueen (2006).

releases trade statistics (Table 6.15). Further constraints are associated to the variety of different contracts traded, as, for instance, the FFABA contacts, ISDA contracts, NYMEX contracts, Imarex/NOS contracts and LCH-ClearNet contracts.

The largest part of the FFA activity takes place predominantly in the European markets (Figs. 6.6 and 6.7). However, the Asian FFA market share is increasing fast, as it has more than doubled during the last two years (to 25% in mid-2006 against 10% in 2004; Macqueen, 2006). The global paper market in dry bulk futures is estimated at about USD 20 billion and Asia covers a quarter of this activity, although liquidity remains a constraint. Major Asian players include Sinochart and Cosco Bulk (China), STX Panocean and Hanjin (South Korea), D'Amico and Wilmar (Singapore).

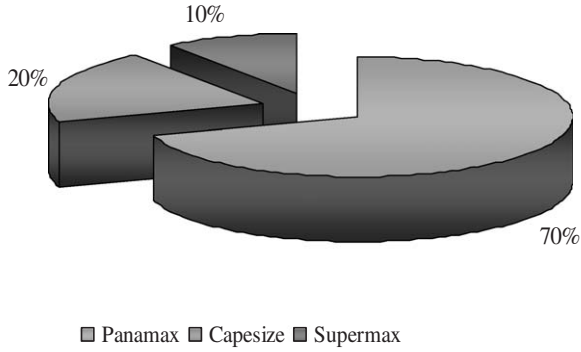

Fig. 6.7. FFA Activity by Market Segment, 2006. *Source:* Macqueen (2006).

The FFA market growth rates are anticipated to increase, provided certain issues are further developed, including (Aury & Steen, 2005): (i) a sizeable option market, as the FFA market is predominantly a swap market with few options traded; (ii) higher activity from Asian players, as a significant share of the physical market is controlled in the Far East; (iii) mark to market valuation for tanker FFAs (as current reference to the Worldscale system is not flexible); (iv) credit facilities enhancement would have a positive impact on FFAs growth and (v) a broader perception by shipping companies supported by practitioners' 'education'.

Quoting Aury and Steen (2005) of Clarkson Capital Ltd, the adoption of a set of measures could boost liquidity in the FFA market. These measures can include: (1) Smaller lots (more applicable to the dry bulk FFA market). Smaller size contracts can represent lower risk for speculators, credit risk diversification across more counterparties, and flexibility in portfolio management. (2) Introduction of maximum pay out clauses, thus, the two counterparties can know in advance the maximum amount to gain or lose. A maximum pay-out FFA swap is a synthetic derivative product, consisting of a normal plain vanilla FFA swap; a zero cost collar, which is made of a put option granted by the floating price payer of the swap to the fixed price payer and a call option granted by the fixed price payer of the swap to the floating payer. A maximum payout FFA can also be modelled using two options (two calls or two puts at different strikes), creating bear or bull spreads. (3) Spreads contracts, which are similar to smaller lots; a specific contract of a spread would result to a credit risk decrease for both counterparties. (4) Options on options could lead to initially smaller premiums being paid, which in turn can boost trading volume.

(5) Development of index deals in the physical market. (6) Spreads FFA/SPFA, as the SPFA market will support spread deals between asset values and charter values with positive implications for liquidity. Another issue that could generate more FFA activity is growth in multi-user screen-based trading systems. The most significant trading system appears to be CIF, planned jointly by brokers Clarksons, Ifchor and Freight Investor Services (FIS), which is expected to allow better credit management, offer transparency and create liquidity and flexibility in the FFA markets. Once, the FFA markets reach a stage of maturity and confidence, options markets are then anticipate to growing further.

The FFA market can operate smoothly on condition it is supported by a flexible clearing mechanism. This is an important issue in forward transactions as an efficient clearing mechanism can contribute to a bigger

Table 6.16. FFA Markets and Contracts.

	NOS-IMAREX	LCH.CLEARNET	NYMEX
Tanker routes			
TC1 Ras Tanura/Yokohama	x		x
TC2 Europe/USAC	x	x	x
TC4 Singapore/Japan	x		x
TC5 Ras Tanura/Yokohama	x		x
TC6 Algeria/Med	x		
TD3 Arabian Gulf/Japan	x	x	x
TD4 West Africa/US Golf	x		
TD5 West Africa/US Atlantic	x	x	x
TD7 North Sea/Europe	x	x	x
TD8 Kuwait/Singapore	x		
TD9 Carib/US Gulf	x		x
TD10D Carib/USAC			x
TD12 ARA/US Gulf	x		
Dry bulk routes			
C3 Capesize coal Brazil/China		x	
C4 Capesize coal Richards Bay/Rotterdam	x	x	
C5 Capesize coal Australia/China		x	
C7 Capesize coal Bolivar/Rotterdam	x	x	
P2A Panamax TC Atlantic to Pacific	x	x	
P3A Panamax TC trans Pacific	x	x	
TC Basket Handymax	x	x	
TC Basket Panamax	x	x	
TC Basket Capesize	x	x	

Source: Imarex (quoted from Parker, 2005).

market, faster execution and lower risk settlement. An important development in 2005 was the introduction of new clearing houses. The biggest and longest established clearing house, NOS-Imarex, was available since 2001, when NOS (Norway) started offering its services linked to the Imarex Exchange. Imarex covers around 40–45% of the tanker FFA market but only around 10% of dry forward transactions. Furthermore, in 2005, two new clearing facilities became available (Table 6.16). The New York Mercantile Exchange (NYMEX) started offering clearing for some tanker FFA transactions and LCH. Clearnet (London) established a clearing arm for shipping derivatives, mainly dry FFAs (Matthews, 2006b). SGX AsiaClear is another clearing house, operating under the Singapore Global Stock Exchange (SGX) and targeting the underlying oil and commodity activities, with promising growth potential.

6.7. CONCLUSIONS

This Chapter has focused on the analysis of modern, innovative and efficient financing, instruments, tools and markets that shipping companies can employ in funding their investment plans. Emphasis was placed particularly on Greek shipping, as this industry segment ranks by far on top of world shipping business. Greek shipowners, furthermore, are well reputed for their aggressive entrepreneurial spirit and innovation skills, including the field of finance. As was discussed, Greek shipping companies can employ a combination of traditional and modern financing instruments and even proceed to innovative hybridic financing combinations. Major financing tools for Greek shipping companies include, new forms of bank lending, leasing and syndication, IPOs in international equity markets, private equity funding, high-yield bond issues, and securitization, whereas FFAs provide an efficient risk management mechanism.

The discussion of recent trends in shipping and capital markets has provided a solid background as to where we are heading. Shipping markets have experienced extraordinary growth rates over the last years. This has resulted to unprecedented corporate profits and robust liquidity reserves for shipping companies. On the other hand, most market participants have followed an intensive fleet expansion strategy, albeit at high-vessel values. This business growth has been funded predominantly by external sources of financing, resulting to many shipping companies ending highly leveraged.

Since newbuilding deliveries are going to follow an upward pace and a large number of new vessels to enter the market over the next three years, it is

anticipated that charter rates are going to show some consolidating trends. Combined with potential recessionary trends in the US or Chinese economies and declining demand growth, this situation may, in turn, result to reduced vessel values. This environment can present business opportunities for shipping companies with robust liquidity, supporting fleet expansion and sustainable long-term growth. However, this situation may also impose severe risk constraints on shipping companies with overleveraged balance sheets. If lower charter rates are seen in the near future, companies with weak liquidity and smaller family-owned firms may become merger and acquisition targets or may seek to form strategic alliances. Shipping companies in need of funds may also be attractive targets to private equity funds that are constantly in search of undervalued investment opportunities.

For companies interested in expanding their fleets, international capital markets and financing instruments present interesting opportunities to fund raising. Shipping companies realize that they should apply more outward-looking business strategies and take advantage of international capital mobility. They gradually follow a more tailor-made use of equity markets and further growth is anticipated in this area, although the recent shipping IPO wave may not be repeated soon. At the same time, shipping finance appears to have reached a stage where innovative financing methods are combined with traditional approaches. These include asset-backed lending and securitization, leasing, syndicated bank loans, structured finance and high-yield bonds. Private equity companies and specialized hedge funds pay increasing attention to financing shipping investments. The growth in freight derivative instruments has served to spread risks associated with shipping and has made shipping a more attractive sector to investors, private equity and hedge funds. Recent experience has indicated that equity investors can be attracted to shipping stocks provided there is a good value story, sound fundamentals and an efficient management to rely on. Banks, on the other hand, follow careful steps in ship lending, as increased competition has kept loan margins tight but they are keen to increase the range of financial products available to shipping companies.

The contribution of shipping remains small in international capital markets but the recent intensive activity has resulted to new levels for the industry as a whole. As more shipping companies go public, new managerial issues are ranged high in priority. The implementation of efficient corporate governance systems and the critical role of the Board of Directors are on top of the list. All in all, new and innovative frontiers in shipping finance will certainly not allow market participants to get bored over the coming years.

REFERENCES

Alizadeh, A., & Nomikos, N. (2003). The price-volume relationship in the sale and purchase market for dry bulk vessels. *Maritime Policy & Management*, *30*, 321–337.

Aury, P., & Steen, P. (2005). Getting liquid. *Lloyd's Shipping Economist* (September), 33–35.

Bendall, H., & Stent, A. (2003). Investment strategies in market uncertainty. *Maritime Policy & Management*, *30*, 293–303.

Brigham, E., & Ehrhardt, M. (2004). *Financial management: Theory and practice*. Florida: Southwestern Publications.

Chen, Y. S., & Wang, S. T. (2004). The empirical evidence of the leverage effect on volatility in international bulk shipping market. *Maritime Policy & Management*, *31*, 109–124.

Erdogan, O. (2005). IPO choice for maritime companies: Turkish evidence. *Eurasian Review of Economics and Finance*, *1*, 7–18.

Fabozzi, F. (Ed.) (2005). *The handbook of fixed income securities* (7th ed.). McGraw-Hill: New York.

Fridson, M., & Garman, C. (1998). Determinants of spreads on new high yield bonds. *Financial Analysts Journal*, *52*, 28–39.

Gong, S. (2003). *How risky are shipping and airline common stocks?* Working Paper, Shipping and Transport Logistics Department, Hong Kong Polytechnic University.

Grammenos, C. (Ed.) (2002). *The handbook of maritime economics and business*. London: LLP Publications.

Grammenos, C., & Arkoulis, A. (2002). Macroeconomic factors and international shipping stock returns. *International Journal of Maritime Economics*, *4*, 81–99.

Grammenos, C., & Arkoulis, A. (2003). Determinants of spreads on new high yield bonds of shipping companies. *Transportation Research Part E*, *39*, 459–471.

Grammenos, C., & Marcoulis, S. (1996). A cross-section analysis of stock returns: The case of shipping firms. *Maritime Policy & Management*, *23*, 67–80.

Harris, L. (2002). *Trading and exchanges: Market microstructure for practitioners*. Oxford: Oxford University Press.

Harwood, S. (1991). *Shipping finance*. London: Euromoney Books.

Jagani, A., & Thabel, G. (2005). Perceptions of FFAs. *Lloyd's Shipping Economist* (November), 19–22.

Jia, J., & Adland, R. (2002). An empirical analysis of the time-varying correlation of returns in international shipping. In: *Proceedings of the Annual Conference of the International Association of Maritime Economists*, November, Panama.

JP Morgan Research. (2006). *Leveraged loans: Alternative asset?* Special Report of JP Morgan Bank, www.jpmorgan.com/index.jsp

Kavussanos, M. (1997). The dynamics of time-varying volatilities in different size second-hand prices of the dry-cargo sector. *Applied Economics*, *29*, 433–443.

Kavussanos, M. (2002). Business risk measurement and management in the cargo carrying sector of the shipping industry. In: C. Grammenos (Ed.), *The handbook of maritime economics and business* (pp. 661–692). London: LLP Publications.

Kavussanos, M. (2003). Time varying risks among segments of the tanker freight markets. *Maritime Economics & Logistics*, *5*, 227–250.

Kavussanos, M., Juell-Skielse, A., & Forrest, M. (2003). International comparison of market risks across shipping-related industries. *Maritime Policy & Management*, *30*, 107–122.

Kavussanos, M., & Marcoulis, S. (1997). The stock market perception of industry risk and microeconomic factors: The case of the US water transportation industry versus other transport industries. *Transportation Review*, *33*, 147–158.

Kavussanos, M., & Visvikis, H. (2006). *Derivatives and risk management in shipping*. London: Witherbys Publishing.

Leggate, H. (2000). A European perspective on bond finance for the maritime industry. *Maritime Policy & Management*, *27*, 353–362.

Macqueen, J. (2006). Risky business. *Lloyd's Shipping Economist* (August), 9–13.

Matthews, S. (2005). Finance options. *Lloyd's Shipping Economist* (October), 9–13.

Matthews, S. (2006a). Top ranking. *Lloyd's Shipping Economist* (March), 37–38.

Matthews, S. (2006b). Taking stock. *Lloyd's Shipping Economist* (March), 28–30.

Matthews, S. (2006c). Disappearing shipowners. *Lloyds Shipping Economist* (August), 27–30.

McGroarty, R. D. (2006a). Waves of demand. *Lloyd's Shipping Economist* (October), 7–10.

McGroarty, R. D. (2006b). Pool of opportunities. *Lloyds Shipping Economist* (November), 24–26.

Mulligan, R., & Lombardo, G. (2004). Maritime businesses: Volatile stock prices and market valuation inefficiencies. *The Quarterly Review of Economics and Finance*, *44*, 321–336.

Nomikos, N., & Alizadeh, A. (2002). Risk management in the shipping industry: Theory and practice. In: C. Grammenos (Ed.), *The handbook of maritime economics and business* (pp. 693–730). London: LLP Publications.

Nomikos, N., & Papapostolou, N. (2006). High yield risks. *Lloyd's Shipping Economist* (July), 30–32.

Panayides, P., & Gong, X. (2002). The stock market reaction to mergers and acquisition announcements in liner shipping. *International Journal of Maritime Economics*, *4*, 55–80.

Parker, B. (2005). Nymex moves on FFAs. *Lloyd's Shipping Economist* (September), 30–32.

Petrofin Bank Research. (2006). *Greek shipping portfolios, held by international and Greek banks* (various issues). www.petrofin.gr/research2006

Randoy, T., Down, J., & Jenssen, J. (2003). Corporate governance and Board effectiveness in maritime firms. *Maritime Economics & Logistics*, *5*, 40–54.

Sarbanes-Oxley Act (2002). *Public company accounting reform and investor protection Act of 2002*. Pub. L. No. 107–204, 116 Sat. 745

Stokes, P. (1997). *Ship finance: Credit expansion and the boom–bust cycle*. London: LLP Publications.

Syriopoulos, T., Merikas, A., & Roumpis, E. (2006). Market interactions and volatility spillover effects between shipping, oil and stock markets. In: *Proceedings of the Annual Conference of the International Association of Maritime Economists*, July, Melbourne.

Syriopoulos, T., & Roumpis, E. (2006). Price and volume dynamics in second-hand dry bulk and tanker shipping markets. *Maritime Policy & Management*, *33*, 497–518.

Syriopoulos, T., & Roumpis, E. (2008). Dynamic asset allocation and management of shipping stock portfolios. *Maritime Policy & Management, 35*, forthcoming.

Syriopoulos, T., & Theotokas, I.(2007). Value creation through corporate destruction? Corporate governance in shipping takeovers. *Maritime Policy & Management, 34*, forthcoming.

Tvedt, J. (2003). A new perspective on price dynamics of the dry bulk market. *Maritime Policy & Management*, *30*, 221–230.

UNCTAD. (2006). *Review of maritime transport*. Secretariat Report of the United Nations Conference on Trade and Development. Geneva.