Impact of mergers and acquisitions on stock returns of tramp shipping firms

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Abstract: This paper examines a new issue in the tramp shipping industry – mergers and acquisitions – which has drawn firms into a competition on size, market share and total tonnage. The purpose of this paper is to investigate the behaviour of tramp shipping firms' stock returns, when they announce mergers and acquisitions, and how this is portrayed on their stock values. The methodology used is event study analysis and bootstrap. Our sample is constituted by member firms of NASDAQ and NYSE. The empirical results indicate the positive impact that announcements of mergers and acquisitions cause in tramp firms' stock returns. The impact of mergers and acquisitions is highly important and plays a key role for firms to follow new challenges in the shipping industry and create higher financial value.

Keywords: bootstrap methodology; consolidation; corporate restructuring; event study analysis; mergers and acquisitions; NASDAQ; NYSE; tramp shipping firms; stock returns.

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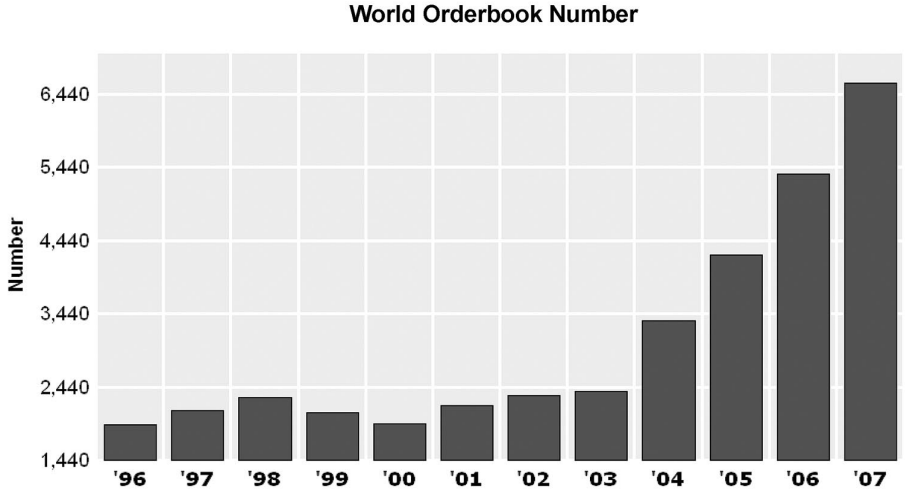
1 Introduction

This paper examines the impact of mergers and acquisitions (M&As) in the tramp shipping industry. Tramp shipping is a part of the shipping industry where vessels do not have a specific route, but their route depends on customers' desires. The transportation of homogenous cargoes, such as iron, ore, coal, grain, oil, or specialised cargoes, such as chemicals, forest products or gas, are some examples of cargoes that tramp shipping firms transfer. Specialised cargoes are often subject to competition from both bulk and liner shipping segments.

The maritime industry has developed greatly in recent years. The new century started with a large number of orders for new building vessels (see Figure 1), as a result of increased demand for shipping services. Hence freight rates increased and offered large profits to ship owners, who invested large amounts of money. High loans and good freight rates pushed owners to time-charter their vessels and gave them secure incomes. Also, the competition became greater and some of the ship owners tried to expand their businesses by M&As.

Figure 1 Total orders of new building vessels



Source: Clarkson Research Services Limited

Shipping, like so many other industries, over the past decade experienced a period of restructuring and consolidation, which is reflected in merger and acquisition activity, as well as global alliances. Over the past decade the handling of M&As changed substantially, as the nature of the challenges that the involved parties had to overcome changed. Globalisation of the shipping industry has not only produced major business opportunities, but has also presented new challenges.

The highly competitive environment in the shipping sector demands low cost and high quality services in order to meet customer needs and to respond to expanding worldwide markets. To stay competitive, companies need to extend their services and invest in more efficient (larger and more expensive) vessels and equipment, minimise their financial risks and reduce their overall costs. Shipping firms need to have a high

degree of flexibility, but not at the expense of safety. The international shipping industry has been undergoing major structural changes due to these factors. The industry has responded to these changes by engaging in M&As.

M&As involve the takeover of a competitor's assets and expertise in order to create a new larger entity. M&As require a level of commitment and investment and result in a relatively high amount of exposure to risk. Shipping is a highly capital intensive industry, a situation which enhances further the risks for those involved in the sector.

In this highly specialised and cyclical industrial sector it is essential for management to possess industry knowledge in order to identify opportunities, enhance execution with speed and efficiency and manage risks involved in the transaction. The management process of carefully distinguishing, negotiating and executing strategic transactions is vital to the success of the business deal. The tramp shipping industry has many private, small- and medium-sized companies that are dispersed all over the world, plus a smaller number of large international public companies that are located in major financial and shipping centres.

Moreover, the number of M&As in tramp shipping remain at low levels, contrary to liner shipping where there are many more. This difference is justified by the different character of these two markets. More specifically, tramp shipping prevails in conditions of perfect competition. Firms' entry and exit from the market is free and simple, while freights are determined by demand and offer. On the contrary, liner shipping is distinguished by oligopoly, the entry and exit is restricted and freights are determined by conferences and alliances. Obviously, in the liner market a firm's force and influence has a decisive role, which is drawn from conferences and alliances, but much more from its unification with bigger companies.

Also, the transportation of bulk cargoes with large volumes, but little value, is more simple and standardised than the transportation of many cargoes with small volume and large value, which presupposes a big and complex administrative infrastructure. This is the reason why tramp shipping firms survive and remain profitable and 'family' owned, while liner shipping firms try to expand their fleet, so that they can compete in the increased market's requirements. Finally, the ship owners of tramp shipping can apply methods that allow them to face the imbalance of offer and demand (e.g. by stopping vessels' operations), contrary to the liner companies that are compelled to apply the timetable that they have announced, independent from changes in demand. Thus, in order to achieve economies of scale and remain profitable, the liner companies are forced to incorporate with bigger and often competitive companies.

This paper contributes to the existing literature by:

- investigating the effect of M&A announcements on tramp shipping firms' stock returns
- examining these effects during 2000–2007, a very important period in maritime industry that was characterised as mature and the reaction of stock prices in various events were more equitable
- extending previous literature about M&As' impact on firms' stock returns
- providing a good guide for tramp shipping firms willing to involve in M&A and act more competitively in this new economic environment for the shipping industry.

The rest of the paper is structured as below. Section 2 is a review of the literature and Section 3 describes the methodology used. Section 4 presents the data from our study and Section 5 provides the empirical results and the evidence of their robustness. Finally, Section 6 draws the basic conclusions emerging from the empirical research.

2 Literature review

The importance of M&As on firms' growth led many researchers to study this issue in various sectors during the last 20 years. Their objective was to measure the effects of M&As on stock returns. M&As 'push' firms' growth, increase their market share, creditability and stock returns.

Kiymaz and Mukherjee (2001) noticed that pre-announcement and post-announcement parameters led at times to different conclusions regarding wealth effects. Bruner (1999) examined Volvo's attempt to merge with Renault in 1993 and found that this attempt cost 1.1$ billion in Volvo shareholder wealth. The reason for this loss was strategy change.

On the other hand, Cybo-Ottone and Murgia (2000) studied M&As in the European Banking industry and concluded that M&As are mainly driven by significant positive abnormal returns. Parisi and Yanez (2000) examined Enersis' takeover from Chile Endesa Espana and concluded that contrary to expectations, the target company had positive cumulative abnormal returns (CARs). The conclusions of Havrylchyk (2004), who examined the Polish banking sector, were the same. Results indicate that polish merged banks experienced positive abnormal returns (ARs) and shareholders increased their profit.

Moreover, Otchere and Ip (2006) investigated the intra-industry effects of cross-border acquisition of Australian firms and found, among others, that the target firms' rival realised significantly positive ARs following both the acquisition proposal and termination announcements. Scholtens and De Wit (2004) studied the effect of the announcement of bank mergers in Europe and the USA and concluded that mergers result in small positive AR and target banks realise significantly higher returns than bidders. Also, there is a difference between the announcement effects of European bank mergers compared to those in USA.

Furthermore, Higgins and Beckman (2006) studied ARs of Japanese acquisition bidders-impact of pro-M&A legislation in the 1990s and came to the conclusion that bidders for domestic targets earn significant ARs. Bleeke and Ernst (1995) suggested that alliances are often precursors to acquisition and that wealth may be destroyed in the merger attempt. Cartwright and Schoenberg (2006) noted that the failure rates of M&As have remained consistently high. Bergh (2001) suggested that one reason for the high frequency of acquisition failure might be because of the retention – and departures – of the wrong acquired company top executives. Hussey (1999) mentioned that M&A activity has a high failure rate, yet is a popular course of action.

Panayides and Gong (2002) studied the stock reaction to M&A announcements in liner shipping. Their event study analysis led to the conclusion that all firms saw their stock price increase rapidly on the announcement of the proposed events, which is long anticipated by the industry.

Maritime industry has been examined by several researchers, but only a few studied M&As and their impact on the firms' value. The subjects of most recent studies are freight forward agreements (FFA), seasonality patterns and asset management (e.g. Kavussanos and Alizadeh, 2001, 2002; Kavussanos and Visvikis, 2004). This 'gap' in the literature let us investigate further the effect of M&As on tramp shipping firms.

As we mentioned before, M&As took place the in shipping industry due to more specific and demanding customer needs. Increased clients expectation lead tramp shipping firms to M&As. This increases their financial strength and liquidity. Even though firms gain many benefits by entering a stock market, the number of tramp shipping firms which are listed in stock exchanges is limited.

3 Methodology

3.1 Event study analysis

Event study analysis has been widely accepted as a research tool in finance, business and economics. Changes in market value can be analysed using the event study analysis, which examines the impact of a single event (or series of events) on a firm's value. Average ARs and cumulative average ARs across stocks that are exposed to the same event of interest are calculated to identify whether the event has caused the stocks to deviate significantly from a relationship suggested by a benchmark model (see Brown and Warner, 1985). Event study methodology may be interpreted as analysing the market's reaction to 'events' or as an empirical investing of the relationship between stock returns and economic informational events such as the announcements of M&As in tramp shipping firms.[1]

The events tested for possible ARs are announcements based on M&As. According to the particular methodology, the expected normal stock returns during a period of $[t_0 \pm t_i]$ days are examined in combination with the announcement date (t_0). The difference between the real and forecasted returns represents the abnormal stock returns. The ARs are calculated as the difference between the real and the expected returns at the duration of $[t_1, t_2]$ days before and after the event's announcement date (t_0) that we examine, according to Equation (1).

In this paper we use the market model to calculate the firms' ARs: the ARs are the difference between the real returns and the forecasted returns. The CARs concern a better observation of repercussions at the stock prices returns.

$$AR_{it} = R_{it} - RF_{it} \tag{1}$$

where: AR_{it} is the abnormal attribution of shipping firm's stock i at day t, R_{it} is the real attribution of shipping firm's stock i, and RF_{it} is the expected attribution of shipping firm's stock i.

Econometric estimation of Equation (1) is carried out using the Ordinary Least Squares (OLS) method for a specific period.[2] We suppose that $AR_{it} \sim [0, VAR(AR_{it})]$ with $VAR(AR_{it}) \approx \sigma^2_{\varepsilon i}$ in case the estimation period is big. Thus, the statistical importance of ARs can be checked via an estimation of the standardised abnormal return SAR_{it} that is determined by Equation (2):

$$SAR_{it} = \frac{AR_{it}}{S(AR_{it})}. \tag{2}$$

Similarly, we can check the CARs' AAR_t statistical importance via Equation (3):

$$SAAR_{it} = \frac{AAR_t}{S(AAR_{it})} \tag{3}$$

where: $AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it}$ and $S(AAR_t)$ is the standard deviation of AAR_t.

It is realised that, the ARs should be calculated accumulatively for a period $[t_1, t_2]$ of days for each event, according to Equation (4):

$$CAR_{i,[t_1,t_2]} = \sum_{t=t_1}^{t_2} AR_{it}. \tag{4}$$

In order to check the CARs' statistical importance, we use the following Equation (5):

$$SCAR_{[t_1,t_2]} = \frac{CAR_{[t_1,t_2]}}{S\left(CAR_{[t_1,t_2]}\right)}. \tag{5}$$

As in the case of AARs, we can check the $CAAR$'s statistical importance by using Equation (6):

$$SCAAR_{[t_1,t_2]} = \frac{CAAR_{[t_1,t_2]}}{S\left(CAAR_{[t_1,t_2]}\right)} \tag{6}$$

where: $CAAR_{[t_1,t_2]} = \frac{1}{N}\sum_{i=1}^{N} CAR_{i[t_1,t_2]}$ and $S\left(CAAR_{[t_1,t_2]}\right)$ = standard deviation of $CAAR_{[t_1,t_2]}$.

In each case of statistical hypotheses tests, the critical values were obtained by the t-student distribution at 5 and 10% levels of significance. In the literature, the calculation period of the CARs is usually between 10 and 50 days before and after the announcement date. We follow this approach, but we report results 20 days before and after the announcement date $t_0[-20, +20]$, since this period includes all the significant results in our sample.

A careful research of tramp shipping firms' share prices, annual reports, reviews, accounts and financial statements, enabled us to find events that occurred during that period and could probably cause our results. In addition, we have cross-checked these events by researching the index of the financial press. Since all information has been gathered from the financial press, we are very cautious. We are not readily aware of various events affecting the share prices since they may have not been published. However, this event window, which includes the announcements of the M&As, is the one with less external effects on firms' stock returns from expected or unexpected reasons.

3.2 Bootstrap methodology

Event study analysis faces several statistical problems deriving from the non-normal distribution of ARs and the small sample size. The problem of non-normality, according to Brown and Warner (1985), is based on excessive skewness, kurtosis and heteroskedasticity. In order to overcome these statistical problems, we adopt the bootstrap technique.

Bootstrap is a computer-based resampling procedure introduced by Efron (1979), which discussed in statistics and econometrics literature over the past 20 years (e.g. Freedman and Peters, 1984). This method requires no analytical calculations. The procedure uses only the original data for resampling to access the unobservable sampling distribution and to provide a measure of sampling variability, bias, and confidence intervals. Efron and Tibshirani (1986) propose that the use of the bootstrap enlarges the type of statistical problem that can be analysed, reduces the assumptions required to validate the analyses, and eliminates the tedious theoretical calculations associated with the assessment of accuracy. More recent studies propose the use of bootstrap, which is free from any specific distributional assumption, to provide better approximations to the sampling distributions of test statistics in event studies (e.g. Chou, 2004; Krammer, 2001).

The first step is to derive the confidence intervals that will help us to determine the bootstrap standard error. Then, the original data set $\overline{X_t}$ is bootstrapped to produce a new data set $\overline{X_t^*}$ having identical or similar time series properties and the original specification is then re-estimated using the new data. This can be repeated N times.

A priori, it is not clear whether the bootstrap method will work, as standard bootstrap techniques fail in the context of non-stationary autoregressions. In our study, we estimate the model with OLS obtaining the residuals. Then, we run the bootstrap sample 1000 times and calculate the OLS estimates for model parameters.

To calculate the t-test, we follow Krammer (2001):

$$Z^k = \sum_{i=1}^{T} \frac{t_i}{\sqrt{T}} \tag{7}$$

where t_i is the t-statistic of the γ_i parameter of the following univariate model:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \gamma_i D_i + e_{i,t} \tag{8}$$

where D_t is a dummy variable that takes the value of 1 on the event day and 0 otherwise.

The standard deviation of t is:

$$\hat{\sigma}_T = \frac{\sqrt{\sum_{i=1}^{T} (ti - \bar{t})^2}}{\sqrt{T-1}}. \tag{9}$$

Hence, we obtain asymptotic normality and following Equation (8), we can measure accurately the effect of the sponsorship event on stock returns. When the percentage of $t*$'s is greater than the corresponding statistic calculated based on the sample which give us the bootstrap, we reach the significance level with a strong p-value and we accept the null hypothesis that $\bar{t} = \sum t_i/T$.

The b draws of $t*$'s constitute a sample from the sampling distribution of the test statistic under the null. As b approaches infinity, the empirical distribution constructed based on $t*$'s will converge to the true sampling distribution of the statistic under consideration. Hence, the p-value can be approximated by the percentage of $t*$'s that are greater than the corresponding statistic calculated that is based on the sample.

4 Data

The data we used refer to M&As in the shipping industry and their stock value around the event. Data were selected from Bloomberg, companies' web pages and finally, from NASDAQ and NYSE Stock Exchanges. The companies selected are shipping firms with different capitalisation so that they constitute, as far as possible, a representative sample.

Our sample is constituted of nine tramp shipping firms that are members of NASDAQ and NYSE. Our study investigates the period 2000–2007. That period is characterised by freight increase, rise of vessels' value, increased number of orders of new building vessels, and entry of shipping firms in Stock Exchanges. Our sample includes 150 daily observations in closing prices. The events tested are 15 (two mergers and 13 acquisitions).

The shipping firms that proceeded to M&As are the following: Overseas Shipholding Group, Gruppo TMM S.A., Teekay Shipping Corporation, Seacor Holdings Inc., Kirby Corporation, Stolt Nielsen S.A., Navios Maritime, Golar LNG and K-Sea Transportation. All these companies are members of NYSE and NASDAQ (Table 1). The selected firms own a variety of vessel types and they are operating in tramp shipping. That means that their vessels do not sail on the basis of a programme or a standard route, but on the basis of the market and needs of those chartering. They transfer dry bulk cargo, oil, liquid natural gas and other large cargoes.

5 Empirical results

In this research, we investigate for stationarity using the Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and KPSS tests. To determine the order of each price series, the tests are computed on the levels. Performing the tests on the levels of each series shows that the null hypothesis of a unit root is not rejected; thus, each series is I (0). On the contrary, the results of the tests on the first differences indicate that each of the series is I (1).

Following Coutts et al. (1995) we ran a number of diagnostic tests on our fitted values and residuals in order to detect possible misspecification/heteroskedasticity/normality problems. The tests revealed excessive skewness, heteroskedasticity and the violation of normality hypothesis.[3] This is the reason why the bootstrap technique is adopted along with event study analysis.

In Tables 2–4, we can see the CARs after a mergers or an acquisition announcement. The results, in general, show that these kinds of announcements affect firms' stock returns in a positive manner.

Table 1 Tramp shipping firms' announcements about mergers and acquisitions

Company	*Target firm*	*Stock market*	*Event*	*Announcement date*
O.S.G. (OSG)	Maritrans (TUG)	NYSE	Acquisition	28/11/06
O.S.G. (OSG)	Stelmar (SJH)	NYSE	Acquisition	20/01/05
O.S.G. (OSG)	Heidmar Lightering	NYSE	Acquisition	26/02/07
Teekay Shipping Corporation (TK)	Petrojarl ASA	NYSE	Acquisition	18/10/06
SEACOR Holdings Inc (CKH)	Seabulk Int. (SBLK)	NYSE	Merger	16/03/05
SEACOR Holdings Inc (CKH)	ERA Aviation (RDC)	NYSE	Acquisition	14/10/04
Kirby Corporation (KEX)	Global Power Holdings Company	NYSE	Acquisition	03/05/06
Stolt Nielsen S.A. (SNSA)	Marine Harvest U.S. INC	NASDAQ	Acquisition	21/12/06
Stolt Nielsen S.A. (SNSA)	Ermefer Food-Grade	NASDAQ	Merger	31/05/05
Navios Maritime (NM)	Kleimar N.V.	NYSE	Acquisition	05/02/07
Golar LNG (GLNG)	20% OLT Energy Toscana	NASDAQ	Acquisition	10/11/06
Golar LNG (GLNG)	Liquified Natural Gas Ltd	NASDAQ	Acquisition	10/04/06
Grupo TMM S.A. (TMM)	40% Transportacion Maritima Mexicana (TMMA)	NYSE	Acquisition	03/06/06
Grupo TMM S.A. (TMM)	ADEMSA	NYSE	Acquisition	11/12/06
K-SEA Transportation (KSP)	Sea Coast Towing Inc.	NYSE	Acquisition	23/08/05

Table 2 Cumulative abnormal returns and statistical significance of the events

Event window	*TK-PETROJARL (t-stat)*	*Bootstrap results (z-stat)*	*OSG-STELMAR (t-stat)*	*Bootstrap results (z-stat)*	*OSG-MARITRANS (t-stat)*	*Bootstrap results (z-stat)*	*CKH-ERA (t-stat)*	*Bootstrap results (z-stat)*	*CKH-SEABILK (t-stat)*	*Bootstrap results (z-stat)*
	0.086725	–0.0751	–2.99144	–0.0208	–3.87204	–0.0654	0.532965	–0.0755	0.87334	–0.0022
[–20,–16]	(5.8608)**		(12.9986)**		(2.1518)**		(2.9298)**		(5.3911)**	
	–1.98328	–0.0123	–3.76144	–0.0012	–0.56204	0.0675	1.232965	–0.0023	2.45334	–0.0123
[–15,–11]	(13.0032)**		(12.1887)**		(3.3793)**		(6.0486)**		(1.4129)*	
	1.216725	–0.0745	0.07856	–0.0014	0.817965	0.0030	1.102965	–0.0602	3.66334	–0.0009
[–10,–6]	(2.2278)**		(3.27375)**		(5.1044)**		(6.0765)**		(2.5429)**	
	0.026725	–0.0023	0.41856	–0.0334	0.797965	–0.0067	–2.80704	–0.0073	–0.95666	–0.0001
[–5,–1]	(1.8009)*		(1.0476)**		(3.0703)**		(1.2242)*		(1.7718)*	
	–1.11328	–0.06002	–3.53144	–0.0001	–3.14203	–0.0222	–0.18704	–0.0032	–1.34666	–0.0023
[–2,2]	(5.2365)**		(1.4427)**		(2.1967)**		(1.5432)*		(6.9542)**	
	2.486725	–0.0723	3.09856	–0.0023	–0.99204	–0.0039	0.572965	–0.0022	–2.47666	–0.0011
[1,5]	(1.9056)**		(3.6047)**		(6.9773)**		(3.3616)**		(1.0019)*	
	–1.62328	–0.0322	2.68856	–0.0021	0.797965	–0.0781	0.792965	–0.0018	0.93334	–0.0001
[6,10]	(9.1703)**		(1.9262)*		(3.0703)**		(4.9939)**		(0.26603)*	
	0.596725	–0.0202	1.73856	0.0089	0.287965	–0.0241	3.392965	–0.0043	1.76334	–0.0056
[11,15]	(4.2743)**		(4.9638)**		(1.1517)*		(2.4035)**		(1.8594)*	
	0.866725		–0.37144	–0.0448	–1.80204	–0.0088	0.932965	–0.0012	–4.36666	–0.0022
[16,20]	(5.5437)*	–0.0122	(1.0159)*		(1.848)*		(5.5977)**		(1.0956)*	

Note: *denotes 5% significance level, **denotes 10% significance level.

Table 3 Cumulative abnormal returns and statistical significance of the events

Event window	*KEX-GPHC (t-stat)*	*Bootstrap results (z-stat)*	*SNSA-ERMEFER (t-stat)*	*Bootstrap results (z-stat)*	*SNSA-HARVEST (t-stat)*	*Bootstrap results (z-stat)*	*NM-KLEIMAR (t-stat)*	*Bootstrap results (z-stat)*	*GLNG-OLT (t-stat)*	*Bootstrap results (z-stat)*
	–0.36933	–0.0023	–0.15041	–0.0027	0.20164	–0.0005	–0.03838	0.0089	0.140965	–0.0056
[–20,–16]	(0.9007)*		(6.9357)**		(8.9884)**		(1.5653)**		(9.3078)**	
	–0.03934	–0.0001	–1.20041	–0.0223	0.15164	–0.0067	–0.04838	–0.0993	0.010965	–0.0098
[–15,–11]	(2.1722)**		(5.3363)**		(6.4785)**		(1.97091)**		(0.7254)	
	1.440665	–0.0003	–0.02041	–0.0389	–1.72836	–0.0005	0.03162	–0.0987	–0.02903	–0.0053
[–10,–6]	(7.5717)**		(0.9486)		(6.5337)**		(1.288141)		(1.9701)**	
	2.750665	–0.0001	1.62959	–0.0084	–1.18836	–0.0011	0.25162	–0.0069	0.680965	–0.0033
[–5,–1]	(1.0369)*		(5.1255)**		(2.6219)**		(1.25054)*		(4.9006)**	
	2.700665	–0.0022	–0.09041	–0.0075	1.37164	–0.0014	0.68162	–0.0208	0.650965	–0.0053
[–2,2]	(1.1975)**		(4.1677)**		(0.73772)*		(2.76796)**		(2.9793)**	
	2.000665	–0.0098	0.00959	–0.0046	0.08164	–0.0334	0.47162	–0.0012	–0.35903	–0.0036
[1,5]	(1.5096)*		(0.44078)		(3.6109)**		(1.21294)*		(2.7049)**	
	–2.99933	–0.0011	1.20959	–0.0003	–1.02836	–0.0001	0.38162	–0.0144	–0.50904	–0.0356
[6,10]	(1.1673)*		(5.7546)**		(5.5369)**		(1.5465)*		(3.6085)**	
	–1.12934	–0.0021	0.91959	–0.0054	2.00164	–0.0023	0.92162	–0.0034	–0.05903	0.0564
[11,15]	(2.3804)**		(2.3919)**		(8.63481)**		(3.54512)**		(3.8773)**	
	2.660665	–0.0034	–0.54041	–0.0089	–0.04836	–0.0021	0.03162	–0.0861	–0.09903	
[16,20]	(1.9656)*		(2.9117)**		(2.1413)**		(1.2841)*		(6.5869)**	–0.0011

Note: *denotes 5% significance level, **denotes 10% significance level.

Table 4 Cumulative abnormal returns and statistical significance of the events

Event window	*GLNG-LNGL (t-stat)*	*Bootstrap results (z-stat)*	*KSP-SEACOAST (t-stat)*	*Bootstrap results (z-stat)*	*TMM-MARMEX (t-stat)*	*Bootstrap results (z-stat)*	*TMM-ADEMSA (t-stat)*	*Bootstrap results (z-stat)*	*OSG-HEIDMAR (t-stat)*	*Bootstrap results (z-stat)*	*AVERAGE (t-stat)*	*Bootstrap results (z-stat)*
	0.15439	–0.0032	1.48781	–0.0334	–0.16288	–0.0012	0.337345	0.0030	0.044285	–0.008	–0.24833	–0.0011
[–20,–16]	(7.8237)**		(1.6154)**		(4.52986)**		(8.9716)**		(2.95999)**		(1.6055)*	
	–0.56561	–0.0008	0.58781	–0.0001	–0.61288	–0.0118	0.107345	–0.0056	0.01283	–0.0012	–0.2811	–0.0023
[–15,–11]	(2.8547)**		(3.3073)**		(1.0448)		(2.8644)**		(0.84704)		(1.8599)*	
	–0.16561	–0.0072	0.14781	–0.0023	0.05712	–0.0003	–0.09266	–0.0222	0.021081	–0.0018	0.436119	–0.0021
[–10,–6]	(8.4863)**		(1.8229)*		(1.588564)*		(2.6554)**		(1.39864)		(2.8087)*	
	–0.16561	–0.00087	–0.81219	–0.0021	–0.06288	–0.0012	–0.07265	–0.0039	0.018584	–0.0334	0.033952	–0.0023
[–5,–1]	(8.4863)**		(5.8387)**		(1.7476)**		(1.9334)**		(1.22882)		(0.2245)	
	–0.44561	–0.00987	1.96781	0.0089	–0.49288	–0.0087	–0.08265	–0.00042	–0.09421	–0.0001	–0.21023	–0.0355
[–2,2]	(2.7329)**		(1.9797)**		(1.7075)*		(2.1944)**		(6.2438)**		(1.3885)	
	–0.30561	–0.01069	2.11781	–0.0193	–0.65288	–0.0097	–0.13266	0.00017	–0.02257	–0.0023	0.393209	–0.0023
[1,5]	(1.5908)*		(1.0311)		(1.1572)**		(3.5994)**		(1.4098)		(2.5916)*	
	0.27439	–0.0208	–0.55219	–0.0002	–0.11288	–0.0024	–0.09266	–0.00097	0.001523	–0.0021	0.010815	–0.0602
[6,10]	(1.9906)**		(4.6863)**		(3.13931)**		(2.6554)**		(0.1028)		(0.0745)	
	0.48439	–0.0012	0.64781	–0.0023	0.14712	–0.0065	0.087345	–0.00076	0.040494	–0.0089	0.789413	–0.0073
[11,15]	(2.7125)**		(4.7284)**		(4.0554)**		(2.34242)**		(2.6752)**		(5.2118)*	
	–0.14561	–0.0014	0.11781	–0.0022	0.12712	0.0275	0.057345	–0.00091	0.038633	0.0023	–0.16938	–0.0032
[16,20]	(7.42832)**		(8.6732)**		(3.5334)**		(1.55945)*		(2.5556)**		(1.1894)	

Note: *denotes 5% significance level, **denotes 10% significance level.

The reaction after a merger is clearly seen in Tables 2–4. Seacor Holdings Inc. (CHK) is a company which operates in five segments: Offshore Marine Services, Marine Transportation Services, Inland River Services, Aviation Services, and Environmental Services. The announcement of its merger with Seabulk (SBLK) gave negative CARs around the announcement date. So, event windows [–5,–1], [–2,2] and [1,5] are negative. Even though they are followed by two positive ones, the last event window [16,20] is negative (–4,36), too. The negative impact reverses positive significant CARs of event windows [–20,–16], [–15,–11] and [–10,–6].

Moreover, Stolt-Nielsen S.A. (SNSA), a company which provides transportation, seafood production, farming, and processing is another company in our study. Its transportation business engages in the transportation, storage, and distribution of bulk liquid chemicals, edible oils, acids, and other specialty liquids. In this study we examine Stolt Nielsen S.A. merger with Ermefer. As we see from Table 3, the impact was positive and is seen at the event windows after the announcement date. The merger with Ermefer changed the investment climate with significant negative event windows [–20,–16], [–15,–11], [–10,–6] and [–2,2], followed by significant positive CARs at event windows [1,5], [6,10] and [11,15].

On the other hand, the number of acquisitions is bigger due to the fact that a merger between two companies is more complicated and difficult than an acquisition. Golar LNG Limited (GLNG), through its subsidiaries, engages in the acquisition, ownership, operation, and chartering of liquefied natural gas (LNG) carriers. Firstly, GLNG and its acquisition with OLT gave a negative affect on its CARs after the announcement of the above-mentioned event. As we observe from Table 2, before the announcement date and around it there are positive event windows, except event window [–10,–6]. However, after the announcement we receive several negative windows.

In Table 4 we have two similar announcements where Grupo TMM, S.A., an integrated logistics and transportation company, is involved (acquired 40% of Maritime Mexicana-MARMEX and ADEMSA). In both cases, CARs behaviour is similar. Even though we observe some positive windows before the announcement date, this changed a window before and after that date. Several, negative windows show that in both cases the impact was negative ([–5,–1], [–2,2], [1,5] and [6,10]).

Studying all the other cases, we find significant results which show that M&As positively influence firms' CARs. Observing Tables 2–4, the high significance levels of the results allows us to make clear conclusions regarding the impact of M&As. M&As, like Teekay and Petrojarl, OSG and Greek-owned Stelmar, Seacor Holdings and ERA, Kirby Corporation and GPHC, Stolt Nielsen S.A. and Harvest, bulker operator Navios Maritime and Kleimar NV and K-Sea Transportation and Sea Coast Towing Inc. present significant positive CARs.

Stolt Nielsen S.A. (SNSA) acquired Marine Harvest and the announcement of this acquisition gave us significant positive CARs at event windows [–2,2], [1,5] and [11,15]. Therefore, previous negative observations at event windows [–10,–6] and [–5,–1] present investors with concern about the efficiency of this event, while we note significant positive CARs at event windows [–20,–16] and [–15,–11]. The behaviour of Seacor Holdings' CARs after the announcement to acquire ERA Aviation were the same (Table 2) Even though the climate was positive before the announcement (event windows [–20,–16], [–15,–11] and [–10,–6]), there are significant

negative CARs at event windows [–5,–1] and [–2,2]. After this reaction, we obtained only positive CARs.

Additionally, Overseas Shipholding Group, Inc. (OSG), a bulk shipping company which engages in the ocean transportation of crude oil and petroleum products acquired Maritrans. As we see from Table 2, the event windows [–2,2] and [1,5] had significant negative CARs, –3,14203 and –0,99204, respectively. The following event windows, [6,10] and [11,15], represent a correction by giving us positive CARs. Negative impact is noted in the last event window [16,–20]. We have to mention that before the announcement the observations were significant and two high negative event windows, [–20,–16] and [–15,–11], were followed by two positive ones. This means that pre-announcement event windows created higher expectations and financial values which reversed the climate until the announcement date.

Moreover, OSG's CARs after the announcement regarding the acquisition of Heidmar show the same behaviour. We mention positive CARs at event windows [–10,–6] and [–5,–1], which are followed by two negative ([–2,2] and[1,5]). After the first negative reaction, we receive three positive event windows. Examining the case of Golar LNG (GLNG) and its acquisition of Liquefied Natural Gas LNGL, we see that negative event windows before and after the announcement, [–15,–11], [–10,–6], [–5,–1], [–2,2] and [1,5], are followed by positive CARs at the windows [6,10] and [11,15]. The significant negative pre-announcement climate reverts at the last event window [16,20].

Teekay Shipping Corporation (TK), together with its subsidiaries, provides international crude oil and petroleum product transportation services to oil companies, oil traders, and government agencies worldwide. In this case, we see that before the announcement the CARs were positive, except window [–15,–11]. However, the window around the announcement date [–2,2] is negative (–1,11328), the impact is prompt and at the next window [1,5] we receive a high degree of positive CAR (2,486725), which is followed by a negative one and then it remains positive at the last two windows [11,15] and [16,20], (0,596725) and (0,866725), respectively.

We also observe positive CARs after the announcement when examining the case of Greek-owned Stelmar's acquisition by OSG. As we see from Table 2, CARs at windows before the announcement date are both negative ([–20,–16] and [–15,–11]) and positive ([–10,6] and [–5,–1]). Even though we mention a highly negative CAR around the event (–3,53144), we receive three high positive CARs at the next event windows. This shows the big impact that this acquisition had on OSG's financial value.

Examining the case of Kirby Corporation (KEX), a company which provides marine transportation and diesel engine services, and it's involvement in Global Power Holdings Company (GPHC), we see that this involvement had a strange impact. Even though, there are some negative CARs before the announcement date [–20,–16] and [–15,–11], the climate was positive from window [–10,–6] and remained positive but at a higher level at the next three windows [–5,–1], [–2,2] and [1,5]. This means that investors had the information for the event some days earlier than the official announcement. The following CARs are negative, but there is also a correction at window [16,20].

Greek-owned Navios Maritime Holdings, Inc. (NM), a seaborne shipping company which offers carriage, trading, storing, and other related logistics for international dry bulk cargo transportation, acquired Kleimar NV. The impact of this event is clearly reported in Table 3. The only negative windows are [–20,–16] and [–15,–11]. After these, the climate improves for Navios' shareholders and we receive continuous positive CARs to a continuously increasing degree. Finally, K-Sea Transportation Partners L.P. (KSP), which provides refined petroleum products marine transportation, distribution and logistics services, purchased shares of Sea Coast Towing Inc. This offered an immediate wealth for the shareholders, while positive CARs were mentioned after the announcement. A negative CAR presented at window [6,10], but the general impact is positive.

The immediate effect is clearly seen in the last column of Table 4 where average CARs (CAARs) are presented. Even though that we observe negative CAARs before the announcement, we see that the climate is getting positive after the news. Significant results show that clearly. We observe that negative event windows are followed by positive ones, after the announcement. The first event window [1,5] after the announcement of the merger or the acquisition shows that the average cumulative abnormal return is significant and positive (0,393209). Event windows [6,10] and [11,15] show a stability in positive CARs, 0,010815 and 0,789413, respectively. Before the announcement dates, the CAARs are negative at windows [–20,–16] and [–15,–11] and positive at [–10,–6] and [–5,–1].

The bootstrap results (Tables 2–4) support the above findings in short differences. Bootstrap performs well in our event study showing a high degree of robustness. The bootstrap test reduces the misspecification significantly and produces more accurate – and in our case – strong results.

6 Conclusions

This paper investigates the impact of M&As on stock returns, using event study analysis and bootstrap methodology. As far as we know, this is the first attempt to measure the impact of tramp shipping firms' M&As on stock returns. The announcements (M&As) tested in this paper influence stock returns positively. The results are in line with Panayides and Gong (2002) regarding M&As in liner shipping firms. This is due to the investors' interest for the impact of important decisions like M&As on firms' stock value.

M&As between companies give negative impact around the event announcement [– 2, 2], which is followed by positive observations at the next two event windows ([1,5] and [6,10]). On the other hand, examining the behaviour of stock returns after M&As, we observe that results show a high positive CAR for event window [1,5]. The results in Tables 2–4 show possible differences in the reaction of participants to M&A announcements in the tramp shipping industry. Some announcements seem to be known before the official announcement date. Generally, the results support that the announcements of M&As have a direct positive impact on stock value of tramp shipping firms. Eleven out of 15 events support that these strategic decisions positively affect tramp shipping firms' stock prices and increase financial value.

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Notes

[1] Early event studies are primarily concerned with the impact of firm-specific events on stock returns. Blinder (1998) provides an excellent survey of the literature on firm-specific event studies. Since the 1980s, developments of event study methodology extended to the investigation of M&As (e.g. Lepetit et al., 2004) and multivariate events, such as regulatory initiatives (e.g. Dnes and Seaton, 1999).

[2] We have also used the Seemingly Unrelated Regression Equations (SURE) method which estimates the parameters of a system, accounting for heteroskedasticity and contemporaneous correlation in the errors across equations. This method produced the same results with the OLS. Results are available from the authors upon request.

[3] In the interests of brevity, all stationarity and diagnostic tests' results are not presented here.