Avrasya Sosyal ve Ekonomi Araştırmaları Dergisi (ASEAD)
Eurasian Journal of Researches in Social and Economics (EJRSE)
ISSN:2148-9963 **www.asead.com**

CO-MOVEMENTS OF PRICE BUBBLES IN STOCK VALUES OF GLOBAL LINER SHIPPING COMPANIES

Abdullah AÇIK[1]
Esra BARAN[2]
İlke Sezin AYAZ[3]

ABSTRACT

In this study, it is aimed to determine the price bubbles in the stock prices of the major container line shipping companies and to investigate whether the stock values of the companies are affected by global developments in the market in the same way by examining the timewise parallel movements between the determined price bubbles. The dataset in the study consists of 8 stock prices of the top 10 biggest container line companies in 2018. The included companies are Hyundai Merchant Marine (HMM), Kawasaki Kisen Kaisha ("K" Line), Nippon Yusen Kaisha (NYK Line), Evergreen Line, Mitsui Osaka Shosen Kaisha (Mitsui O.S.K. Lines- MOL), Orient Overseas (OOCL), Yang Ming Marine Transport Corp. and Cosco Shipping Co. The companies which are not traded in the stock market and the once whose data includes big breaks are not included in the sample of the study. The dataset covers the dates between 05th November 2010 and 6th July 2018 and consists of weekly observations. Unlike the conventional methods, using the rolling window technique, the Generalized Sup Augmented Dickey-Fuller (GSADF) test, which yields successful results in the detection of multiple price bubbles in the series, was used to determine the price bubbles in the stock values of the container line shipping companies. According to the results of the study, the timewise parallel movements were determined between the price bubbles in some stock values, while there was no parallelism in some of them. Based on the findings of the study, it can be deduced that the factors affecting the stock values of the container line shipping companies vary. It is considered that it will be more useful to understand the bubble mechanism by including potential factors in econometric models and testing with empirical studies in further studies.

Keywords: Price bubbles, Container shipping, Stock values, GSADF Test

INTRODUCTION

The positive deviation of the value of an asset or service from its actual value is indicative of a price bubble and generally refers to a temporary over-valuation. These bubble periods are very important for investors, since the selling out of assets at the right time makes it possible to obtain satisfactory profits. In order to achieve this, some factors need to be considered. Stock can be grouped according to some factors such as countries in which they are traded, stock markets where they are traded or sectors they belong to.

Liner shipping companies, which play a major role in the realization of trade in the global sense, also form a sectoral group, and stocks of many companies are traded on various exchange markets. These stocks are affected by many factors and fluctuates through the time as the values of other general stocks are affected. One of the fundamental factors affecting the values is freight market conditions and generates a significant simultaneous impact on all stakeholders in the sector. At this point, this study approaches stock values in terms of price bubbles and aims to examine the co-movement between the bubbles in the stock values of global major liner companies in order to find out possible relevance. In accordance with this purpose, stock values of 8 major global liner shipping companies from top ten ranking have been selected. GSADF test, which is accepted as a

[1] Research Assistant, Dokuz Eylül University, Maritime Faculty, abdullah.acik@deu.edu.tr
[2] Research Assistant, Dokuz Eylül University, Maritime Faculty, esra.baran@deu.edu.tr
[3] Research Assistant, Dokuz Eylül University, Maritime Faculty, ilke.ayaz@deu.edu.tr

successful method to obtain multiple price determinations in the series, is used. Then the correlation relationships between the bubble periods of the companies are examined. This study is a first in the literature in terms of both the determination of price bubbles in the stock values of global liner shipping companies and the examination of the correlation between the spotted bubbles.

According to the results, multiple price bubble periods are determined in the stock values of the global liner shipping companies. After that, a dummy variable is generated by assigning a value of "1" to these periods and the correlation between companies is examined. The results have revealed that there are positive significant correlations between bubble periods of several companies, especially between those traded on the same stock market. This situation indicates that the stock values are fairly affected by the stock markets where they are traded as well as by the other factors such as freight market conditions on the market, customer preferences, intercompany competition, company performances and macroeconomic conditions.

The rest of the study is organized as follows; the relevant literature is reviewed in the first section; the method used in the study is introduced in the second section; the results obtained from the analyses are presented in the third section; and finally, the findings are evaluated in the last section.

1. LITERATURE REVIEW

Since the price bubbles that occur in the stocks are derived from the movements of their prices, firstly, the factors affecting the stock values should be mentioned. The factors affecting the stock prices are mainly categorized as internal and external factors in the literature. While the firm specific factors and financial variables are considered as internal factors, macroeconomic indicators and political factors are considered as external factors. When the literature is reviewed it has been seen that there are different study findings investigating the determinants of stock prices.

Some study findings revealed that external factors related to macroeconomic indicators are the main influential factors of stock prices. For instance; GDP (Nisa and Nishat, 2011), industrial production (Nasseh and Strauss, 2000; Hondroyiannis and Papapetrou, 2001; Humpe and Macmillan, 2009), inflation (Mahmood and Mohd Dinniah, 2007; Nisa and Nishat, 2011; Allahawiah and Al Amro, 2012), interest rate (Nasseh and Strauss, 2000; Hondroyiannis and Papapetrou, 2001; Humpe and Macmillan, 2009; Nisa and Nishat, 2011), exchange rate (Hondroyiannis and Papapetrou, 2001; Mahmood and Mohd Dinniah, 2007), oil prices (Hondroyiannis and Papapetrou, 2001), monetary variables (Muradoglu et al., 2001), consumer price index (Humpe and Macmillan, 2009), and money supply (Humpe and Macmillan, 2009). Political factors are also significantly associated with the stock prices (Sunde and Sanderson, 2009).

Other studies found that firm specific factors and financial variables such as company size (Nisa and Nishat, 2011; Sharif et al. 2015), nature of firm (Allahawiah and Al Amro , 2012), CEO duality (Gill et al., 2012) internationality of the firm (Gill et al., 2012), earnings per share (Nisa and Nishat, 2011; Sharma, 2011; Gill et al., 2012; Sharif et al. 2015; Aveh and Awunyo-Vitor, 2017), return on equity (Sharif et al. 2015; Aveh and Awunyo-Vitor, 2017), book value per share (Sharma, 2011; Gill et al., 2012; Sharif et al. 2015; Aveh and Awunyo-Vitor, 2017), dividend per share (Sharma, 2011; Gill et al., 2012; Sharif et al. 2015) and dividend yield (Sharif et al. 2015; Aveh and Awunyo-Vitor, 2017) are significant factors affecting the stock prices.

The studies examining the factors that affect stock prices for the maritime companies are limited in the literature. External factors obtained by several studies are oil prices (Grammenos and Arkoulis, 2002; El-Masry et al., 2010), laid up tonnage, exchange rate (Grammenos and Arkoulis, 2002) and macroeconomic risk factors (Drobetz et al., 2010). On the other hand, the factors

discovered in the firm specific concept are reveals announcement of a merger or acquisition (Panayides and Gong, 2002), earnings from asset sale (Apergis and Sorros, 2010).

In addition, there is a similar study in the literature that investigates whether the stock prices of the major liner shipping companies are efficient in the weak form or not (Açık et al., 2018). According to the results of the study, the stock prices of the companies which are subject to the study are not efficient in weak form. There is a dependence on past prices, and they can be estimated by developing strategies through their past values. In other words, they do not follow random walk. These results can also be interpreted as prices are influenced and manipulated by some information holders in the market. The results indicate that those who have knowledge in the market are one of the most important factors affecting stock values as well.

All of the mentioned factors may cause price bubbles by forming over-valuation of stock prices, even if their impacts vary to different degrees. These price bubbles, regardless of which factors affect them, provide their investors excessive profit opportunities. Therefore, it is hoped that the determination of the co-movements between the bubbles in the different stocks provide great advantages to concerned investors. In this respect, this study takes into account the sectoral impact by examining the co-movement between the price bubbles in the stock prices of the major liner shipping companies serving in the same sector. This study is a first in the literature in terms of both the determination of price bubbles in the stock values of global liner shipping companies and the examination of the correlation between the spotted bubbles.

2. METHODOLOGY

The prices in the market usually follow fluctuating courses. This form of movement results in cycles, and although each cycles have different heights, they have trough and peak points. The increases and decreases usually take place over time following a trend, however these changes occur at extraordinary degrees in some periods. When increases in the positive directions are extremely high, the market price constitutes a bubble at the price which is much higher than the real value. These price bubbles are usually temporary. Briefly, a bubble can be defined as a sharp rise in price of an asset or service (Kindleberger, 1987). In a bubble, price of an asset or service excessively deviates from its fundamental value (Visco, 2005: 165).

In order to determine the price bubbles, several methods, such as left-tailed unit roots and cointegration analysis, have been used over time. However, it has been found that these standard methods have difficulty in detecting explosive bubbles when there are many collapsing bubbles in the series (Evans, 1991). Several studies have been conducted by many researchers to overcome this deficiency. Philips et al (2011) has firstly developed a right-tailed unit root test namely sup augmented Dickey-Fuller (SADF). This method is introduced as a successful method to detect sequential collapsing balloons. Afterwards, it is discussed that this method is effective when there is a single explosive bubble in the series. However, it is natural for a series to contain more than one explosive bubbles (Su et al., 2017). To overcome this deficiency, in a further study, generalized sup augmented Dickey-Fuller (GSADF) test has been proposed by Philips et al (2012). In this method, it is more possible to determine the price bubbles at the time they are formed by the flexible moving sampling feature. ADF type regression estimates are recursively estimated as a fixed sized rolling window (Caspi et al., 2015). The process proposed by Caspi (2013) is used through E-views econometric software. The results obtained from the analysis are presented in the next section.

3. FINDINGS

The dataset in the study consists of 8 stock prices of the top 10 biggest container line companies in 2018. The stock prices of Cosco, HMM, "K" Line, MOL, NYK Line, OOCL, Evergreen and Yang Ming companies are used in the study, and the period is covered between 5th

November 2010 and 6th July 2018. The descriptive statistics of the stock values of all companies are presented in Table 1. The table provides information on the structure of the series, then the GSADF test is applied on the raw data.

Table 1: Descriptive statistics of the variables.

	COS.	**HMM.**	**KAW.**	**MOL.**	**NYK.**	**OOCL**	**EVE.**	**YANG**
Mean	4.16	76556	2397	3453	2612	48.0	15.8	24.7
Med.	3.77	61004	2470	3435	2542	44.5	15.6	25.9
Max.	9.59	250042	3775	5816	3796	82.5	25.8	57.1
Min.	2.63	4143	960	1837	1394	26.5	10.4	8.81
Std. Dev.	1.42	65895	630	836	596	14.8	3.19	10.3
Skew.	1.89	0.59	-0.35	0.39	0.16	0.79	0.74	0.69
Kurt.	6.30	2.11	2.72	3.25	2.01	2.58	3.51	3.35
J-B.	423	36.5	9.60	11.2	17.8	45.4	40.8	33.7
Prob.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Obs.	401	401	401	401	401	401	398	398

Source: Investing, 2018

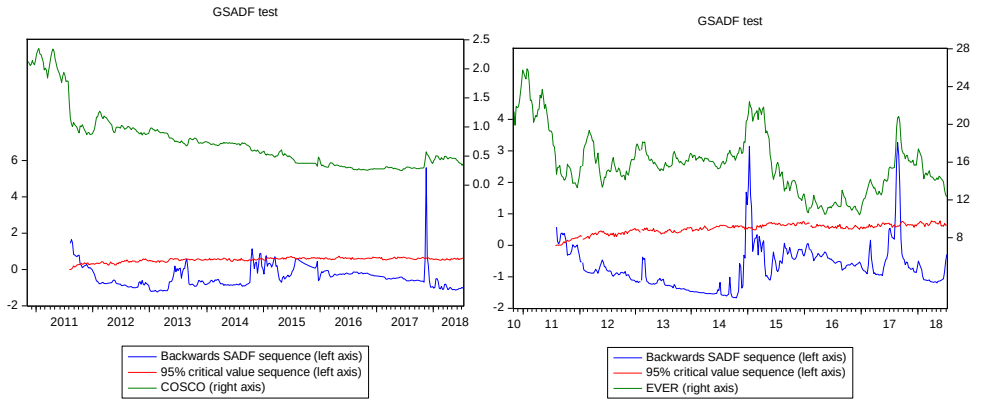
The null hypothesis of the GSADF test used in the study is that the series do not contain at least 1 significant price bubbles. The GSADF test is implemented for stock values of the all companies and the results of for the determination of price bubbles are presented in Table 2. According to the results, null hypothesis is rejected at 99% significance level for Cosco, Evergreen, HMM and OOCL shares while it is rejected at %90 significance level for Yang Ming. "K" Line and MOL share values are not significant even at 90% significance level, however it is not wrong to think that they have significant price bubbles since their probability values (0.12) are very close to the critical level and they contain significant bubbles in graphical representations in Figure 3 and Figure 4. However, the probability value of NYK Line's stock is far from acceptable level (0.31). After this test phase, the graphical test results of each stock value are presented as doubly due to the page limitations.

Table 2: GSADF price bubble test results.

		COS.	**EVER.**	**HMM.**	**KAW.**	**MOL.**	**NYK.**	**OOCL**	**YANG**
T-stats		5.59	3.26	3.11	1.84	1.84	1.47	3.69	2.15
Test	99% level	2.82	2.92	2.82	2.82	2.82	2.82	2.82	2.92
critical	95% level	2.18	2.26	2.18	2.18	2.18	2.18	2.18	2.26
values:	90% level	1.93	2.01	1.93	1.93	1.93	1.93	1.93	2.01
Probabilities		0.00***	0.00***	0.00***	0.12	0.12	0.31	0.00***	0.06*

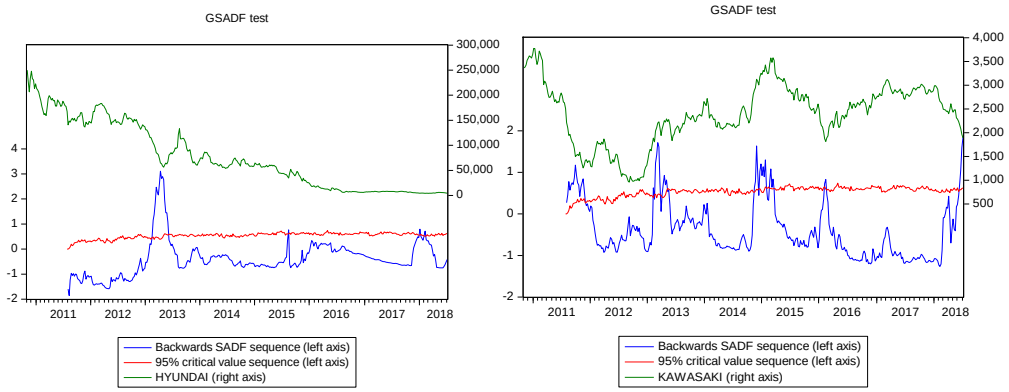
Firstly, the visual output of the test results of the Cosco and Evergreen companies is presented in Figure 1. Seven price bubble periods are determined for Cosco company and specifications of these periods are as follows; 9 weeks between 09.08.2011 - 04.10.2011, 3 weeks between 14.10.2014 - 28.10.2014, 2 weeks between 09.12.2014 - 16.12.2014, 1 week on 20.01.2015, 1 week on 17.03.2015, 1 week on 28.07.2015, and 2 weeks between 14.11.2017 21.11.2017. Three price bubbles are spotted for Evergreen company and durations of these bubbles are as follows; 9 weeks between 05.08.2011 - 30.09.2011, 6 weeks between 19.12.2014 – 21.01.2015, and 5 weeks between 11.08.2017 – 08.09.2017.

Figure 1: COSCO (left) and Evergreen (right) bubble test results.



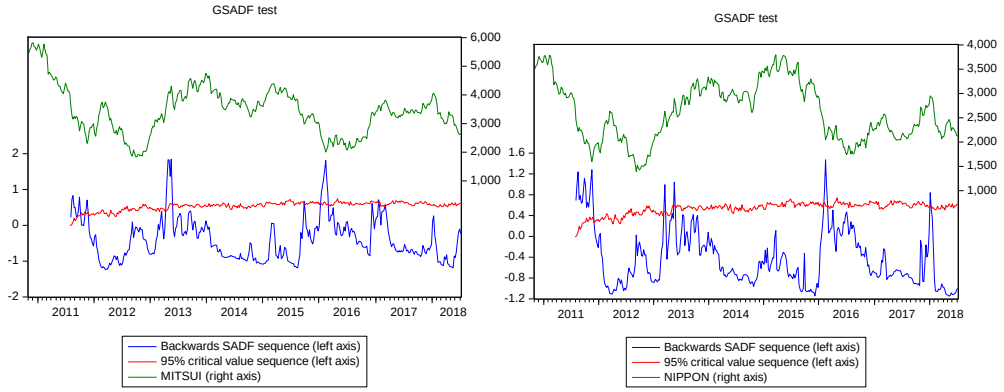
The visual results of the GSADF test are presented in Figure 2 for the HMM and "K" Line companies. Four price bubbles are determined for HMM company, whose specifications are as follows; 15 weeks between 22.02.2013 – 31.05.2013, 1 week on 14.08.2015, 1 week on 05.01.2018, and 1 week on 09.02.2018. Nine price bubbles are spotted for "K" Line company, whose durations are as follows; 18 weeks between 05.08.2011 – 02.12.2011, 1 week on 08.02.2013, 5 weeks between 22.02.2013 – 22.03.2013, 5 weeks between 05.04.2013 – 03.05.2013, 4 weeks between 14.11.2014 – 05.12.2014, 7 weeks between 19.12.2014 - 30.01.2015, 4 weeks between 20.02.2015 - 13.03.2015, 2 weeks between 05.02.2016 - 12.02.2016, 4 weeks between 15.06.2018 - 06.07.2018.

Figure 2: HMM (left) and "K" Line (right) bubble test results.



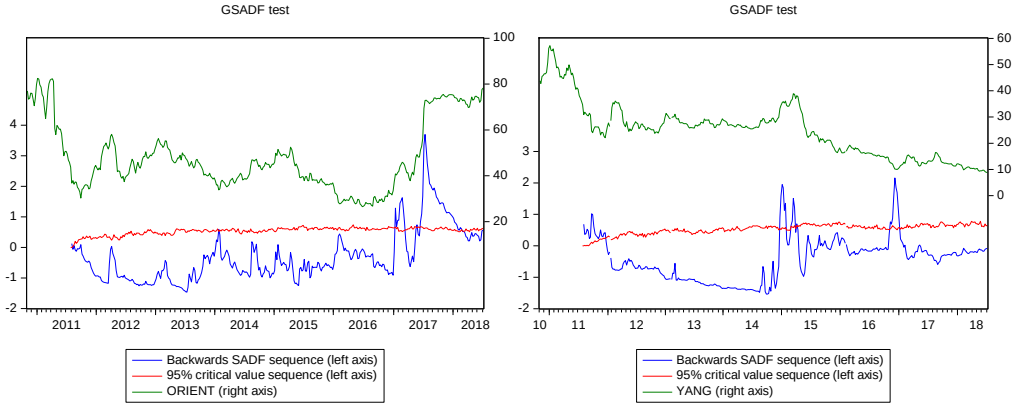
Another visual results of the GSADF test are presented in Figure 3 for the MOL and NYK Line companies. Eight price bubbles are determined for MOL company, whose durations are as follows; 6 weeks between 05.08.2011 – 09.09.2011, 3 weeks between 23.09.2011 – 07.10.2011, 3 weeks between 11.11.2011 - 25.11.2011, 7 weeks between 12.04.2013 – 24.05.2013, 1 week on 25.09.2015, 7 weeks between 15.01.2016 – 26.02.2016, 1 week on 20.01.2017, 1 week on 03.03.2017. Five price bubbles are spotted for NYK Line company whose specifications are as follows; 18 weeks between 05.08.2011 - 02.12.2011, 1 week on 15.03.2013, 1 week on 17.05.2013, 3 weeks between 05.02.2016 – 19.02.2016, and 1 week on 05.01.2018. However, as presented in Table 2, the null hypothesis can not be rejected in the GSADF test for NYK Line company. Therefore, visually the presence of bubbles in the graph does not mean a statistical significance.

Figure 3: MOL (left) and NYK Line (right) bubble test results.



The last visual results of the GSADF test are presented in Figure 4 for the OOCL and Yang Ming companies. Six price bubbles for the OOCL company are as follows; 1 week on 05.08.2011, 1 week on 24.11.2014, 9 weeks between 13.01.2017 – 10.03.2017, 1 week on 26.05.2017, 37 weeks between 16.06.2017 - 23.02.2018, and 1 week on 09.03.2018. Five price bubbles are spotted for Yang Ming company which are as follows; 20 weeks between 05.08.2011 – 16.12.2011, 6 weeks between 19.12.2014 – 23.01.2015, 4 weeks between 27.02.2015 – 20.03.2015, 1 week on 03.04.2015, and 9 weeks between 11.11.2016 – 06.01.2017.

Figure 4: OOCL (left) and Yang Ming (right) bubble test results.



Dummy variables are generated for each stock exchange by giving the number "1" to the dates of the price bubbles, and the correlation relationships are examined in order to determine co-movement between them. The type of correlation analysis that should be applied differs according to the distribution of variables, however there is no difference between using Spearman or Pearson correlations since the variables used consist of "0" and "1". The results of the Pearson correlation analysis are presented in Table 5.

The correlation coefficients are interpreted according to their value. Soh (2016:40) defines these values as follows; between 1.00 and 0.90 is very high; between 0.90 and 0.70 is high; between 0.70 and 0.40 is medium; between 0.40 and 0.20 is low; and, between 0.20 and 0.00 is very low.

According to the results, the highest level of correlations observed between the price bubbles are medium degree. The results have been evaluated based on columns respectively. A positive medium degree correlation of 0.53 between Cosco and Evergreen has found. There are also some low degree correlations of Cosco with "K" Line (0.35), MOL (0.29), NYK Line (0.38) and Yang

Ming (0.35). Another significant medium degree correlation has been observed between Evergreen and Yang Ming (0.49). Also, there are some low degree correlations of Evergreen with "K" Line (0.40), MOL (0.28) and NYK Line (0.37). Correlations of HMM are low degree with "K" Line (0.28) and MOL (0.25). "K" Line have significant medium degree correlations between MOL (0.43), NYK Line (0.59) and Yang Ming (0.54). MOL has a medium degree positive correlation between NYK Line (0.57), while it has a low degree correlation with Yang Ming (0.28). Lastly, NYK Line has one significant medium degree correlation between Yang Ming (0.54). When the medium degree correlations are evaluated in order to narrow the process, they are observed between Cosco - Evergreen, "K" Line -Evergreen, Yang Ming – Evergreen, "K" Line – MOL, "K" Line – NYK Line, "K" Line – Yang Ming, MOL – NYK Line, and Yang Ming - NYK Line. From these results, it can be understood that the stocks with high correlations are usually traded on the same exchange market. In addition, the merger between "K" Line, MOL and NYK in mid-2018 may cause the parallelism between stocks to become stronger in the further periods.

Table 3: Correlations between the price bubbles.

Market	Stock	COS.	EVE	HMM.	KAW	MOL.	NYK.	OOCL.	YANG
Hong Kong	**COSCO**	1.00							
Taiwan	**EVER**	0.53*** (0.00)	1.00						
Seoul	**HMM**	-0.05 (0.30)	-0.05 (0.29)	1.00					
Tokyo	**"K" Line**	0.35*** (0.00)	0.40*** (0.00)	0.28*** (0.00)	1.00				
Tokyo	**MOL**	0.29*** (0.00)	0.28*** (0.00)	0.25*** (0.00)	0.43*** (0.00)	1.00			
Tokyo	**NYK Line**	0.38*** (0.00)	0.37*** (0.00)	0.09* (0.08)	0.59*** (0.00)	0.57*** (0.00)	1.00		
Hong Kong	**OOCL**	0.01 (0.81)	0.11** (0.03)	-0.01 (0.72)	-0.13** (0.01)	-0.03 (0.56)	-0.04 (0.41)	1.00	
Taiwan	**YANG**	0.35*** (0.00)	0.49*** (0.00)	-0.08 (0.12)	0.54*** (0.00)	0.28*** (0.00)	0.54*** (0.00)	-0.11** (0.02)	1.00

CONCLUSIONS

In this study, price bubbles in the stock values of 8 of the world's top 10 container liner companies are determined, and the co-movement between them is examined. Price bubbles are determined by GSADF method which is successful in detecting multiple price bubbles in the series. Then dummy variables are formed by giving a value of "1" where the bubble is detected in the covered period. Finally, the correlation relationships between these dummy variables have been examined. According to the results, there are medium degree significant correlations between the stock values of some liner companies. From these results, it can be understood that the stocks with high correlations are usually traded on the same exchange market. This situation shows that the stock market where the stocks of the liner companies are traded is very effective on their stock values as well as their performance on the maritime market, since the price bubbles of the maritime companies traded in the same stock market usually follow parallel courses. These results also confirm that the stock values do not show random walk and affected by the other factors in accordance with the results obtained by Açık et al (2018).

It is of great importance to be aware of bubble periods as these periods in stock values offer great opportunities for investors. In such a period, the sale of stocks provides extraordinary profit opportunities to investors due to the fact that the bubble periods are often temporary. This study is hoped to provide an important contribution by demonstrating that the overvaluation of the stocks values of maritime companies are highly affected by the stock market where they are traded. It is very important for stakeholders who invest in these instruments to take account of these results in order to obtain satisfactory profits. Despite this importance, the lack of a similar study in the literature increases the originality of this study.

Further studies may identify factors affecting the probability of bubble formation in the stock values of the liner companies using logit or probit models. Thus, leading indicators can be determined and followed in order to capture bubble periods in investment decisions.

REFERENCES

Açık, A., Baran, E., and Ayaz, İ.S. (2018). *Hisse senedi fiyatlarında etkinlik: Konteyner şirketleri üzerine bir araştırma*. Paper Presented at II. International Symposium on Innovative Approaches in Scientific Studies. Samsun, Turkey, 685-689.

Allahawiah, S. and Al Amro, S. (2012). Factors affecting stock market prices in Amman Stock Exchange: A survey study. *European Journal of Business and Management*, 4(8), 236-245.

Apergis, N. and Sorros, J. (2010). Disaggregated earnings and stock prices: Evidence from international listed shipping firms. *International Advances in Economic Research*, 16(3), 269-281.

Aveh, F. K. and Awunyo-Vitor, D. (2017). Firm-specific determinants of stock prices in an emerging capital market: Evidence from Ghana Stock Exchange. *Cogent Economics & Finance*, 5(1), 1339385.

Caspi, I. (2013). *Rtadf: Testing for bubbles with EViews*.

Caspi, I., Katzke, N. and Gupta, R. (2015). Date stamping historical periods of oil price explosivity: 1876–2014. *Energy Economics*, 70(C), 582-587.

Drobetz, W., Schilling, D. and Tegtmeier, L. (2010). Common risk factors in the returns of shipping stocks. *Maritime Policy & Management*, 37(2), 93-120.

El-Masry, A. A., Olugbode, M. and Pointon, J. (2010). The exposure of shipping firms' stock returns to financial risks and oil prices: a global perspective. *Maritime Policy & Management*, 37(5), 453-473.

Evans, G.W. (1991). Pitfalls in testing for explosive bubbles in asset prices. *The American Economic Review*, 81(4), 922–930.

Gill, A., Biger, N. and Mathur, N. (2012). Determinants of equity share prices: Evidence from American firms. *International Research Journal of Finance and Economics*, 90(90), 176-192

Grammenos, C. T. and Arkoulis, A. G. (2002). Macroeconomic factors and international shipping stock returns. *International Journal of Maritime Economics*, 4(1), 81-99.

Hondroyiannis G. and Papapetrou E. 2001. Macroeconomic influences on the stock market. *Journal of Economics and Finance*, 25(1), 33-49.

Humpe, A. and Macmillan, P. (2009). Can macroeconomic variables explain long-term stock market movements? A comparison of the US and Japan. *Applied Financial Economics*, 19(2), 111-119.

Investing. (2018). *Stock values of the liner companies*. Access Date: 30.10.2018, https://tr.investing.com/

Kindleberger, C. P. (1987). Bubbles in The New Palgrav, In J. Eatwell, M. Milgate, and P. Newman (eds), The *new palgrave: A dictionary of economics*, London: MacMillan.

Mahmood, W. M. and Mohd Dinniah, N. (2007). *Stock returns and macroeconomic influences: Evidence from the six Asian-Pacific Countries*. Financial Economics and Futures Market Research Paper.

Muradoglu G., Metin K. and Argae R. (2001). Is there a long-run relationship between stock returns and monetary variables: evidence from an emerging market. *Applied Financial Economics*, VII(6), 641-649.

Nasseh, A. and Strauss, J. (2000). Stock prices and domestic and international macroeconomic activity: a cointegration approach. *The Quarterly Review of Economics and Finance*, 40(2), 229-245.

Nisa, M. N. and Nishat, M. (2011). The determinants of stock prices in Pakistan. *Asian Economic and Financial Review*, 1(4), 276-291.

Panayides, P. M. and Gong, X. (2002). The stock market reaction to merger and acquisition announcements in liner shipping. *International Journal of Maritime Economics*, 4(1), 55-80.

Phillips, P.C.B., S. Shi, and J. Yu, (2012). *Testing for Multiple Bubbles*. Cowles Foundation Discussion Paper, No. 1843, Yale University, New Haven, Connecticut, USA.

Phillips, P.C.B., Y. Wu, and J. Yu, (2011). Explosive behavior in the 1990s NASDAQ: When did exuberance escalate asset values?. *International Economic Review*, 52, 201–226.

Sharif, T., Purohit, H. and Pillai, R. (2015). Analysis of factors affecting share prices: The case of Bahrain Stock Exchange. *International Journal of Economics and Finance*, 7(3), 207-216.

Sharma, S. (2011). Determinants of equity share prices in India. *Researchers World*, 2(4), 51.

Soh, K. (2016). *Understanding test and exam results statistically: An essential guide for teachers and school leaders.* Singapore: Springer.

Su, C. W., Li, Z. Z., Chang, H. L. and Lobonţ, O. R. (2017). When will occur the crude oil bubbles?, *Energy Policy*, 102, 1-6.

Sunde, T. and Sanderson, A. (2009). A review of the determinants of share prices. *Journal of Social Sciences*, 5(3), 188-192

Visco, I. (2005). Comments on Recent Experiences with Asset Price Bubbles. In Hunter, W.C., Kaufman, G.G. and Pomerleano, M. (eds), *Asset price bubbles: The implications for monetary*, pp. 165-171. USA: MIT Press.