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Herd behavior in the drybulk market: an empirical analysis of the decision to invest in new and retire existing fleet capacity

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ABSTRACT

We examine whether investors herd in their decision to order or scrap vessels in the drybulk market. We decompose herding into unintentional and intentional, and test for herd behavior under asymmetric effects with respect to freight market states, cycle phases, risk-return and valuation profiles, and ownership of the vessel. We detect unintentional herd behavior during down freight markets and contractions. Furthermore, we find evidence of spill-over unintentional herding effects from the newbuilding to the scrap market. Finally, asymmetric herd effects are evident between traditional and liberal philosophy towards the ownership of the vessel, and during extreme risk-return and valuation periods.

1. Introduction

Shipping investment for newbuildings is mainly categorized into replacement, expansionary and new entrance investment. Replacement shipping investment involves the allocation of capital for the purposes of replacing vessels that are no longer capable of fulfilling the company's requirements and are, therefore, available for demolition. Major reasons for replacement realized through the newbuilding market include technical obsolescence, market conditions, international regulations, and company policy. Next, expansionary shipping investment constitutes capital outlay for materializing the growth strategy of shipping companies in response to prevailing or expected market conditions that are usually accompanied by availability of ship finance sources. Lastly, new entrance shipping investment involves the injection of capital into newbuilding acquisitions by newcomers to the industry. The decision to expand fleet capacity is mainly linked to freight market conditions (Engelen et al., 2006; Adland and Strandenes, 2007; Stopford, 2009; Greenwood and Hanson, 2015; among others) as companies expand to maintain or increase their market share. Secondhand prices and their relation to newbuilding prices (Merikas et al., 2008; Stopford, 2009) also constitute a major influence in the decision to order new vessels due to construction lags (Kalouptsidi, 2014), as shipping investors may demand immediate delivery of vessels when freight rates are at high levels. On the other hand, scrapping a vessel is a major decision that irreversibly disposes a capital-intensive asset, while certain vessel features – age, technical obsolescence and condition –, international regulations and the market state will influence the likelihood of a vessel being sent for demolition. Generally, for older and poor condition[1] vessels, employment potential and scope for capital appreciation are limited, thus, leading to higher scrapping levels. In addition to vessel age and deteriorating condition, technical obsolescence is also likely to result in reduced running cost

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[1] Younger vessels in poor condition may also be scrapped earlier than older vessels in good condition, if the scrapyard appears as a more feasible option than a costly vessel overhaul.

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efficiency, greater maintenance and crew costs, and higher insurance premia; therefore, drive vessels to the scrapyard. Furthermore, vessel retirement taking place due to regulatory changes is a compulsory decision. In terms of market state, if freight conditions are such that it is not economically feasible to operate vessels, then shipping investors are faced with the decision to continue operations at a loss, lay-up or scrap the vessel. Operating at a loss and lay-up are reversible options with expectations as to future profitability playing an important role. In contrast, scrapping is an irreversible decision that shipping investors have traditionally preferred to avoid, even during severe oversupply conditions when outstanding debt obligations and equity base depletion are further obstacles. The decision to scrap vessels is linked to the prevailing freight, secondhand and scrap market conditions. Buxton (1991) argues that there is little economic sense in operating a vessel or selling her in the sale-and-purchase market when both markets have deteriorated significantly. Knapp et al. (2008) confirm the hypothesis of an inverse relation between vessel earnings and the probability of a ship being scrapped, establish a positive relation between scrap prices and scrapping probability, and find no significant relation between flag, ownership or safety factors and scrapping. Recently, Alizadeh et al. (2016) examine the capacity retirement in the drybulk market by employing a combination of vessel specific and market variables. The study confirms the previously established negative association between earnings and scrapping, and the fact that higher scrap prices lead to elevated scrapping activity; while the probability of scrapping increases with age, interest rates, and freight volatility. Finally, market expectations are key in shipping investment/divestment decisions under freight income uncertainty (Stopford, 2009) and the application of real options theory provides shipping companies with valuable flexibility in the decision making process (Dixit and Pindyck, 1994; Dikos, 2008; Gkochari, 2015; Kyriakou et al., 2017).

However, vessel ordering and scrapping activity is a strategic decision that, among other factors, may be the outcome of shipowners revising their own market outlook upon observing the actions of others, i.e., there is a degree of herd behavior involved. Herd behavior is generally used to describe trading decisions that are based on the collective actions in a market rather than personal beliefs and information (Hwang and Salmon, 2004). This trading behavior can lead a group of investors to move in the same direction and, as a consequence, herding can cause asset prices to deviate from their fundamental values (Bikhchandani et al., 1992; Nofsinger and Sias, 1999). Therefore, examining herd behavior may provide an understanding of its influence on asset values (Chang et al., 2000). For example, investors might be interested in the existence of herding, as reliance on common rather than private information may cause assets to deviate from the fundamental values and present profitable opportunities. Herding has also attracted the attention of academics because the associated behavioral effects on asset price movements may affect their risk-return characteristics and, therefore, can have implications for asset pricing models.[2] In addition, according to Scharfstein and Stein (1990), classical economic theory suggests that investment decisions reflect the rationally formed expectations of agents, i.e., decisions made utilizing all the available information in an efficient manner; in contrast, investment may also be driven by group psychology (herd behavior), which weakens the link between information and market outcomes. Our aim is to provide an understanding of some of the forces that may lead to herd behavior in the shipping markets. Existing literature on investigating herd behavior is mainly concentrated on herding between institutional/retail investors (e.g., Lakonishok et al., 1992; Sias, 2004; Kumar and Lee, 2006) or herding towards the market consensus (e.g., Christie and Huang, 1995; Chang et al., 2000). Our paper falls within the latter strand and tests for herding behavior in the newbuilding and scrap markets of drybulk vessels.

Our main contribution to the ship finance literature is the fact that this paper, to the best of our knowledge, is the first to examine herd behavior in the shipping industry. To that end, we first test for overall herd behavior and, then, for unintentional and intentional herding. To achieve the latter, we augment our herding equation to provide evidence on whether investors base their decisions on common elements that they share or just mimic the decisions of few reputable investors due to an informational disadvantage.[3] Further, we test for asymmetric herd behavior effects in terms of extreme market movements, contraction and expansion phases; and whether there are any spill-over herding effects from one market to another. Finally, we provide additional tests for asymmetric effects based on the notion of an old and a new generation of shipowners, and extreme risk-return profiles and market valuation periods.

Furthermore, while the existing literature focuses on financial markets and assets, our contribution is the examination of herd behavior in a real assets market setting; therefore, we overcome the problem of using proxies to capture direct real assets investment/divestment. For example, several studies (see Philippas et al., 2013; Babalos et al., 2015; among others) examine herd behavior in the real estate market based on Real Estate Investment Trusts (REITs), as these products represent a good proxy for the real estate market (Hsieh and Peterson, 2000; Zhou and Lai, 2008; Lee and Chiang, 2010) because their assets consist of investments in real estate.

Overall, our results indicate that shipping investors unintentionally herd in their decision to contract new and/or scrap older vessels, and we attribute this herd behavior to relative homogeneity. Moreover, we establish asymmetric herd behavior as unintentional herding is likely to be encountered only during down markets in both the newbuilding and scrap markets. This result is complemented by the detection of unintentional herding in the scrap market, which is more profound during

[2] In the drybulk market, the efficient market hypothesis (EMH) and asset pricing models focus mainly on the term structure of freight rates, vessel price formation, risk premium and trading strategies (Kavussanos and Alizadeh, 2002; Adland and Koekebakker, 2004; Kavussanos et al., 2004; Adland and Strandenes, 2006; Alizadeh and Nomikos, 2006, 2007). However, herding behavior may not always be regarded as an anomaly which contradicts the efficient market hypothesis; rather, if it is assumed that investors trade in the direction of informed investors, then asset prices may converge faster to their fundamental values (Gavriilidis et al., 2013; Economou et al., 2015).

[3] Only recent studies have concentrated on the issue of intentional and unintentional herding (Holmes et al., 2013; Galariotis et al., 2015).