Economic significance of market timing rules in the Forward Freight Agreement markets

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ABSTRACT

Quantitative market timing strategies have been traditionally tested in liquid commodity and financial futures, often with mixed results with respect to their performance. We extend this methodology to a non-storable commodity, freight, where hitherto this analysis has not been carried out. The freight futures market is mature and increasingly liquid, making it a good case for diversification and trading opportunities. We carry out a comprehensive study of quantitative trading strategies in the FFA (Forward Freight Agreements) market on a wide variety of contracts and maturities with a number of trading rules. We find that in spite of robustness checks, trading rules do outperform the buy-and-hold benchmark in general. We also explore the possibility that illiquidity and a small sample size may impact the results of the tests and therefore offer an intuitive approach to mitigate their effects. A procedure that augments the Hansen (2005) SPA (Superior Predictive Ability) methodology and allows us to use it for smaller sample sizes with increased confidence is also proposed.

1. Introduction

The shipping industry is an integral part of the global economy as it moves up to 90% of the international trade in a very cost-efficient way; the cost of ocean freight represents, on average, 6% of either the import value or the shelf price of imported consumer goods, and as such affords genuine economies of scale to consumers (UNCTAD Report, 2010). With large volumes shipped at relatively low costs, the shipping industry is vital to the sustainability and growth of the global economy and therefore increasingly seen as a barometer for its health. For instance, the Baltic Dry Index (BDI), which is an assessment of the cost of moving dry bulk commodities by sea, is considered by the investment community as a leading indicator of economic activity (see Kilian, 2009; Bakshi et al., 2011).

The cost of seaborne transportation is reflected by the level of freight rates which are determined freely in competitive international markets; as such, freight markets exhibit price characteristics similar to those of other commodity markets such as high volatility, volatility clustering, seasonality, cyclicality and dependence on global commodity and financial markets. Operating in the freight market therefore poses significant price risk to participants who often mitigate this risk either through long-term time-charter contracts or, increasingly, with the use of derivatives products, such as Forward Freight Agreements (FFAs), which afford them greater operational flexibility. FFA are cash-settled forward contracts that trade the value of expected freight rates, the underlying asset being one of the freight indices published by the Baltic Exchange. Initially, this market was primarily used for risk management by participants that had direct exposure to freight rates, such as shipowners, ship-operators, charterers and commodity traders. The growth in seaborne trade and freight rates from the

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first years of the new millennium – driven primarily by the increasing demand for raw materials from developing countries – led to an increase in the participation of market players outside of the shipping industry such as investment banks, fund managers and hedge funds. As a result, according to market sources, it is estimated that as of 2011 the value of trading for speculative purposes is more than twice that for hedging, with a 70/30% split. With the majority of participants using FFA contracts for speculative trading, it is interesting to investigate the effectiveness of trading strategies in the FFA markets, in keeping with contemporary studies in the finance literature but also allowing for the unique nature of those contracts both in terms of their characteristics as well as the way they are traded.

Trading based on technical analysis, in particular, is widely utilized by traders and analysts in the FFA markets either to generate trading signals or to support their trading decisions. The main objective for doing so is to identify trend- and momentum-based patterns in prices though it is not uncommon to encounter strategies aiming to identify trend reversals, market cycles and channel break-outs. The economic significance of these trading rules is generally tested out of sample. Nevertheless, there are various impediments to trading FFA's in the manner common to trading more liquid contracts. First, despite the fact that freight rates are determined freely in competitive markets, adjustments to information are not immediately impounded in current prices. Trades are primarily carried out through brokers in the OTC market and are therefore subject to '*friction*' in terms of the speed of execution, liquidity and transaction costs, which may significantly affect profitability. Second, one also has to consider the nature of the underlying asset, which in this case is a non-storable service. Generating trading signals in storable commodities is generally carried out using fundamental analysis of the extant supply and demand. It is therefore expected that inefficiencies in the underlying markets, caused by temporary shocks either to the supply or the demand side, are arbitraged away in the futures markets with equilibrium being restored in the longer run. The same argument however, is difficult to apply to the freight market, which is considered a non-storable commodity owing to the nature of the underlying being a service. Though freight rates are determined through the interaction of supply (availability of fleet) and demand (seaborne trade), the absence of a storage relationship means that the link between spot and forward prices may not be as strong as in the case of storable commodities. In addition, the forward market includes non-shipping market participants, such as investment banks and hedge funds, whose motivations for trading may be more complex and driven by other parameters, in addition to market fundamentals. This may make fundamental analysis less effective in detecting market signals, while technical analysis may still be able to uncover underlying market trends.

Therefore, in this study we test the economic significance of quantitative trading strategies in a robust but intuitive manner and in a form that broadly represents general market practices. We consider 11,548 different parameterizations of trading strategies applied to the FFA markets both across vessel sizes as well as the term structure. In order to make this a realistic exercise all rules are applied on a forward looking basis and thus the results reported indicate the performance that a trader would have achieved in the market if he had followed the same approach. The evaluation of active trading strategies is made on the basis of mean outperformance as well as risk-adjusted outperformance measure – Sharpe ratio – over the benchmark position which is a buy-and-hold portfolio of FFAs. The analysis is carried out in the Capesize, Panamax and Supramax FFA routes, across a range of contract maturities and considering all other parameters that may affect the performance of trades such as delays in the execution of the orders (slippages) and transaction costs. The robustness of the outperformance of trading strategies is automatically questioned in technical analysis studies owing to "*data snooping*" or selection bias brought into the analysis by means of re-using the same data set over and over again, while testing a host of trading rules. In order to quantify the effect of a data snooping bias across sectors and contract maturities, we incorporate White's (2000) reality check (WRC) methodology and the improvements to the same in the form of the Superior Predictive Ability (SPA) test by Hansen (2005).

Previous attempts to apply technical analysis in the freight markets were generally restricted to physical shipping markets such as tanker freight rates (Adland and Strandenes, 2006) or to work out the optimal investment decisions in the sale and purchase of vessels (Alizadeh and Nomikos, 2007). Despite the growth in the number of studies looking at statistically predictable patterns in commodity and currency futures markets, notably by Marshall et al. (2008a, 2008b) for index futures and Miffre and Rallis (2007) for commodity and financial futures, there has been no attempt at investigating the same within the FFA markets. The freight market offers a very interesting area for the application of technical analysis especially in the rally years before the recent financial crisis (from 2005 to the second half of 2008), as freight markets had a positive trend which would have made it difficult to generate any timing signals for active strategies on the basis of modeling fundamentals alone. It is anticipated that this environment would force traders to look more towards technical strategies, particularly in order to generate trading signals over shorter horizons.

By investigating the performance of trading strategies in the FFA markets, we also aim to add to the existing body of literature regarding the distinction between "young" and "mature" or "established" markets. For instance, Hsu and Kuan (2005) find that trading rules are able to generate profits in relatively "*young*" markets (the Russel 2000 index being used as a proxy) as opposed to Sullivan et al. (1999) (hereafter STW) and Aronson (2011) who find that the same set of rules are unable to significantly outperform the benchmark in "*established*" markets, such as the S&P 500. They attribute this to younger markets attracting newer investors and arbitrageurs who then go on to exploit the inefficiencies using a host of trading strategies, eventually reducing these opportunities in time. This apparent "*self-destruction*" of profitable trades when more and more investors begin to use them has also been studied by Timmermann and Granger (2004) and is used to explain the decline of the predictive power of technical rules over time, which is also in keeping with Lo's (2004) adaptive markets hypothesis (AMH); AMH is especially relevant to our study as it posits a Darwinian "*natural selection*" process amongst strategies and market participants, in which competition initially flourishes and eventually opportunities become well publicized