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Dynamics of Dry Bulk Freight Market: Through the Lens of a Common Stochastic Trend Model*

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Contents

Abstract

This paper shows the possibility that, as a simple average, BDI occasionally over- or under-states the status of global dry bulk freight market. In order to overcome this shortcoming, this paper suggests an alternative method of calculating new index by using a common stochastic trend model. This econometric approach to understanding the dynamics of dry bulk freight markets not only provides new index, but also gives a decomposition method. That is, through this lens of common stochastic trend model, we can decompose the freight data into common (or permanent) and idiosyncratic (or transitory) components.

Key words : common stochastic trend model, co-integration, index, dry bulk,

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I. Introduction

It is accepted that Baltic Dry Index (BDI) has worked well as a representing index for global dry bulk freight markets.[1) 2)] This good performance can be seen easily. On 26th May 2010, the BDI was 4,209p which was 74% increase from that of 1st September 2009. Its components such as Capesize, Panamax, Supramax, and Handysize TCavg increased by 58%, 100%, 76%, 82% from the same base date. However, this paper seeks an alternative to BDI as the index because occasionally BDI understates the status of smaller ship markets, for example, Supramax and Handysize. On 15th July 2010, the BDI was 1,700p (30% decrease from the base date) and Capesize TCavg decreased by 68%. However, Supramax TCavg decreased by only 3% and Handysize TCavg increased by 16%, respectively. For a convenience of exposition, suppose that an observer uses the BDI as the representing index for smaller ships. This person should make a mistake.[3)]

BDI is calculated as an equally weighted average of the sub-market indices. This simple average (e.g., BDI) or a weighted average (e.g., BCI, BPI, BSI and BHSI) as an index can perform well. But, for the purpose in a specific context, a prior another index using different calculation method cannot be rejected as an index. Along with this pragmatic argument, this paper provides an alternative index to BDI for representing the global dry bulk freight markets.

For this purpose, this paper uses the information of the correlations among dry bulk sub-markets. In the 1st sample,[4)] the correlations between the variables are at least 0.92. This high correlation could imply that there is a common trend among the variables, as shown in section III. However, in the

1) For the explanation of BDI and related indices (BCI, BPI, BSI, BHSI, etc), refer to the Baltic Exchange (2010) or Alizadeh and Nomikos (2009). Although the latter didn't reflect the current change about Baltic indices, it summarized them compactly.

2) Some of the referees commented that, since there is not actually a single market called dry bulk, an effort to approximate the index to the actual dry bulk market would lack utility value. However, this paper seeks an alternative index based on the following three reasons: First, there seems to be some popular view that BDI is a representing index for global dry bulk freight markets. For example, Alizadeh and Nomikos (2009) said "The index (BDI) is widely used by practitioners as a general market indicator reflecting the movements in the dry-bulk market. It is in other words the 'barometer' of dry-bulk shipping." (pp. 112-113) Also, in Wikipedia, a popular web-based encyclopedia, BDI is explained in the following way: "The index (BDI) indirectly measures global supply and demand for the commodities shipped aboard dry bulk carriers, such as building materials, coal, metallic ores and grains." Second, as shown on <Table 3>, during the period from Jan. 2007 to Aug. 2008, there seems to have been a common trend among four dry bulk sub-markets in the 8% significance level, which is the empirical result, not the presumed phenomenon. Third, as Chen, Meersman and Voorde (2010) showed, there could be a common trend between Capesize and Panamax markets. This possible hypothesis can be supported by the fact that the Capesize and Panamax ships usually transport the same cargoes such as iron ore and coal.

3) Because the Baltic Exchange provides BCI, BPI, BSI and BHSI for the various ship sizes, i.e., Capesize, Panamax, Supramax and Handysize, as the indices, we can easily escape from this mistake.

4) The reason why this paper excluded the period from 30th Aug. 2008 to 30th June 2009 in the sample can be explained as follows: First, the excluded period might be affected so much by the global financial crisis that the inclusion of this period without such proper statistical treatment as regime switching could distort the empirical results of this paper. Second, since the new composition of BDI started on 1st July 2009, the period from the date when the global financial crisis is thought to have ceased to 30th June 2009 is too short to infer statistically by using that period as a reference period.