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The Survey and Criterion of the Compass Rose in Chinese A-Share Market

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Abstract

The compass rose is one of the few “recurring patterns” found in financial markets. In this paper, the compass rose in Chinese A-share market is comprehensively investigated. It is newly discovered that among the 1331 A-shares, which had been listed for more than 15 years by the end of 2015, only about 20 show the compass rose. The outcome of the analysis shows that there exists a threshold of the ratio of the data points on main rays to all data points. Only when this ratio is above the threshold, the compass rose appears. The reasons why such a threshold exists, and its interrelationship with the data frequency and the tick/volatility ratio are analyzed.

Keywords: Chinese A-share market, Compass rose, Angular distribution histogram, Criterion, Threshold

1. Introduction

Economics is similar to physics. By profiting from the concepts and methods in physics, econophysicists have already achieved encouraging attainments [1, 2, 3], such as financial data analysis, option pricing models [4], scaling and power-law behaviors of financial market [5, 6, 7, 8], “recurring patterns” identifying in financial markets [9, 10, 11, 12, 13, 14], etc. The compass rose is one of the few “recurring patterns” discovered in financial markets. When a procedure similar to chaos researchers’ is employed to explain the scatter diagram of daily stock returns plotted against themselves with one day’s lag, a strikingly geometrical structural relationship (the “Compass Rose”) is documented [9] (see Fig. 1).

The compass rose appears clearly when the following conditions are satisfied [9]:

1. Daily changes of stock XYZ are small relative to the price level;

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