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Importance of skewness in decision making: Evidence from the Indian stock exchange

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ABSTRACT

In this paper our goal is to examine the importance of skewness in decision making, in particular on investor utility. We use time-series daily data on sectoral stock returns on the Indian stock exchange. We test for sectoral stock return predictability using commonly used financial ratios, namely, the price-to-book, dividend yield and price-earnings. We find strong evidence of predictability. Using this evidence of predictability, we forecast sectoral stock returns for each of the sectors in our sample, allowing us to devise trading strategies that account for skewness of returns. We discover evidence that accounting for skewness leads not only to higher utility compared to a model that ignores skewness, but utility is sector-dependent.

1. Introduction

The subject of asset pricing is at the forefront of research in financial economics. A popular sub-subject has been stock return predictability. Our interest in this paper is on stock return predictability. In this literature, two aspects of research have been dominant. The first aspect has been on the development of econometric methods for testing stock return predictability (see Campbell & Yogo, 2006; Lewellen, 2004; Westerlund & Narayan, 2012, 2014a, b). The second aspect is related to the first in that upon finding evidence of stock return predictability, the focus has been on understanding the economic significance of such predictability. Typically, trading strategies are evaluated as part of this economic significance analysis. The most popular trading strategy has been motivated by a mean–variance utility function. Generally, the findings are rousing in that studies have confirmed that based on return forecasts successful trading strategies, for an investor who faces a mean–variance utility function, can be devised.

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We extend this literature by focusing on the second aspect—that is, on the economic significance of stock return predictability. Our position is this: The utility function used to estimate investor utility takes account of only the first (mean) and second (variance) moments of stock returns. We, therefore, ask: will accounting for the third moment of returns (skewness) improve investor utility? By answering this question, we extend the utility function to a mean–variance-skewness (MVS) investor. Several studies have shown the importance of skewness in financial economics (see, inter alia, Arditti, 1967; Golec & Tamarkin, 1998; Garrett & Sobel, 1999; Bhattacharya & Garrett, 2008; Kraus & Litzenbeger, 1976; Patton, 2004; Prakash, Chang, & Pactwa, 2003; Jondeau & Rockinger, 2006; Mitton & Vorkink, 2007).

This contribution is discussed below. In light of the overall importance of skewness in understanding financial market and pricing behaviours in general, it is surprising that financial economists have not considered the role of skewness in the economic significance analysis.

More specially, three reasons motivate the need for accommodating skewness in tests of investor utility. First, skewness in financial time-series data, particularly high frequency data, is prevalent. As Harvey and Siddique (1999) argue, skewness varies through time and has a systematic relationship with expected returns and variance. Second, there is a relationship between trading volume and skewness. The negative skewness in returns, as found in the Hong and Stein (1999) model, is more pronounced during periods of high trading volume. Third, Harvey and Siddique (2000) show that conditional skewness helps explain the cross-sectional variation of expected returns across assets.

Our main approaches and findings are as follows. First, we have monthly stock return and financial ratios (price-to-book ratio, price-earnings ratio, and dividend yield) for sectors listed on the Bombay Stock Exchange. We have a total of eight sectors. Analysing this sectoral data suggests three features; (a) the financial ratios across all eight sectors are persistent, (b) most predictors in the eight sectors are endogenous, and (c) the predictive regression model is heteroskedastic. Second, we attempt to predict sectoral stock returns using these financial ratios as predictors. Using the Westerlund and Narayan (2014a) generalised least squares (GLS) estimator, we find strong evidence of predictability across all sectors. That sectoral returns are predictable allows us to forecast returns using each of the three financial ratios as predictors. We do forecast sectoral returns and use forecast returns to estimate an investor's utility function that accounts for skewness and variance and compare utility from this utility function with one that only accounts for the variance. The difference in utility allows us to gauge the relevance of skewness for investors. We find that across all sectors the difference in utility is positive, suggesting that a utility function that accounts for skewness offers investors higher utility than one that makes use of only the variance of returns.

We organise the balance of the paper as follows. A discussion of data and preliminary features of the data is discussed in the next section. Section 2 discusses the literature and highlights our contribution. Section 3 contains a discussion of the main results. This section is actually divided into two parts; in the first part, we focus on sectoral return predictability, while, in the second part, we focus on estimating investor utility from a mean–variance and a mean–variance-skewness utility functions. The objective here is to examine if utility from MVS beats utility from MV utility function. The final section concludes with the key findings.

2. Literature on Indian stock market

The goal of this section is to provide a brief overview of the literature on the Indian stock market and draw out our paper's main contribution to the literature. The literature on the Indian stock market is growing, and has taken several directions. Principally, there are studies that investigate the efficiency of the Indian stock market through testing its integration properties (see Mishra, Mishra, & Smyth, 2014); there are studies that examine whether exchange rates impact the Indian stock returns (see Narayan, 2009); recent studies analyse the relationship between stock returns and mutual fund flows for India (see Narayan, Narayan, & Prabheesh, 2014); momentum strategies have been used to test whether the Indian stock market is profitable (see Narayan, Ahmed, Sharma, & Prabheesh, in press; Narayan, Narayan, & Prabheesh, 2014); and the impact of the US macroeconomic conditions on India's stock market have been studied by Narayan and Narayan (2012). The empirical evidence from these studies points to: (a) the importance of exchange rates for stock returns; (b) evidence in support of spillover effects in the mutual fund and equity markets; (c) predictability of stock returns; (d) evidence that the Indian stock market is profitable and that there are some sectors of the market which are more predictable than other sectors; and (e) the stationarity of Indian stock indices, suggesting they are predictable.