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Can analysts predict rallies better than crashes?

Ivan Medovikov *

Department of Economics, Brock University, 429 Plaza Building, 500 Glenridge Avenue, St. Catharines, Ontario L2S 3A1, Canada

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ABSTRACT

We use the copula approach to study the structure of dependence between sell-side analysts' consensus recommendations and subsequent security returns, with a focus on asymmetric tail dependence. We match monthly vintages of I/B/E/S recommendations for the period January–December 2011 with excess security returns during six months following recommendation issue. Using a mixed Gaussian–symmetrized Joe–Clayton copula model we find evidence to suggest that analysts can identify stocks that will substantially outperform, but not underperform relative to the market, and that their predictive ability is conditional on recommendation changes.

1. Introduction

Investment value of analyst recommendations has been the subject of considerable research during the past twenty years. This comes as no surprise, given the substantial resources that investment banks, brokerage houses and their clients spend on security analysts, and the attention that recommendations attract from the media and the investing public. It is now generally established that analysts possess stock-picking abilities, meaning trading strategies based on recommendations that yield positive returns in excess of the market are possible (see Stickel, 1995; Womack, 1996; Barber et al., 2001; Jegadeesh and Kim, 2006, among others), but the circumstances under which this is the case are not always clear. Profitability of a recommendation appears to depend on many factors, including whether it represents a revision or reiteration of an earlier opinion (Jegadeesh et al., 2004; Barber

* Tel.: +1 905 688 55 50x6148.
E-mail address: imedovikov@brocku.ca

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et al., 2010), on timely access to analyst reports (Green, 2006), portfolio turnover (Barber et al., 2001), and proximity of earnings announcements (Ivković and Jegadeesh, 2004). While determinants of recommendation profitability received substantial attention, interestingly, no studies appear to focus on return characteristics associated with greater predictability. For example, are analysts better at calling out extreme price fluctuations than normal movements? If so, are there asymmetries in this relationship: can analysts better predict significant rallies or crashes? The aim of this paper is to fill this gap.

The absence of literature on nonlinear and extreme dependence between ratings and returns may stem from the lack of suitable multivariate distribution models that can accommodate the very different marginal behavior of recommendations and returns, with return distributions known to be symmetric and leptokurtic and recommendation distributions – skewed and often bimodal. To this end, this paper adopts the copula approach and uses a highly-flexible semiparametric model to measure dependence between the level of recommendations and subsequent security returns. To the best of our knowledge, this appears to be the first application of copulas to the analysis of recommendations in the literature.

Our particular focus is on tail dependence, or dependence among extremes. We match monthly vintages of I/B/E/S consensus recommendations issued during 2011 with corresponding excess security returns six months following recommendation issue, and using a mixed Gaussian and symmetrized Joe–Clayton copula model find strong evidence of dependence in the upper, but not lower tail of the joint distribution. In other words, we find that stocks with most favorable recommendations tend to substantially outperform the market, while stocks with most unfavorable recommendations show no similar tendency to underperform, suggesting that analysts' predictive abilities are asymmetric and are skewed toward picking substantially undervalued rather than overvalued stocks. We also find that this relationship only holds for stocks that experienced a recent deterioration of consensus opinion, suggesting that profit opportunities identified here may be driven by investors' over-reaction to declines in analysts' outlook for top-rated securities.

The paper is organized as follows. Section 2 reviews some basic concepts behind copulas, and introduces the copula model and estimation technique used in this paper. The matching of I/B/E/S data with excess returns and the filtering of the data are discussed in Section 3. Estimation results are presented in Section 4, followed by a brief discussion in Section 5.

2. The methodology

2.1. Copula functions

The copula approach is central to this paper, and we begin by reviewing some of the basic concepts behind the theory of copulas. Consider a pair of random variables X and Y, and let $F(x)$ and $G(y)$ represent their marginal distribution functions (CDFs), and $H(x,y)$ be the joint CDF. Following a result by Sklar (1959), the joint CDF H can be written as

$$H(x,y) = C[F(x), G(y)], \quad (x,y) \in \mathbb{R}^2, \tag{1}$$

where the function $C : [0,1]^2 \to [0,1]$ is the so-called copula of X and Y. Copulas have become central to the analysis of dependence as they provide a complete, and in the case of continuous random variables, a unique description of the relationship between X and Y. Letting $u = F(x)$ and $v = G(y)$, it becomes clear that the copula is simply the joint CDF of (u,v) which we can write as $C(u,v) = H(F^{-1}(u), G^{-1}(v)), (u,v) \in [0,1]^2$. Note that for any F and G, u and v are uniform on $[0,1]$, meaning that the model of dependence encoded in C is free from the specification of the marginals. A model of H can therefore be constructed by specifying the marginals and the dependence structure separately. This feature makes copulas particularly well-suited for the analysis of dependence between recommendations and security returns, since it allows for easy combination of marginals that are very different. For an introduction to copulas see Joe (1997) and Nelsen (2006); and Cherubini et al. (2004) and Patton (2009) for applications of copulas in finance.