Journal of Banking & Finance 37 (2013) 2501–2509

Contents lists available at SciVerse ScienceDirect

Journal of Banking & Finance

journal homepage: www.elsevier.com/locate/jbf

Rewards for downside risk in Asian markets

Lakshman Alles [a,1], Louis Murray [b,*]

[a] School of Economics and Finance, Curtin University of Technology, Perth 6001, Australia
[b] School of Business, University College Dublin, Blackrock, Co. Dublin, Ireland

ARTICLE INFO

Article history:
Received 15 November 2011
Accepted 6 February 2013
Available online 21 February 2013

JEL classification:
G12
G15
O16

Keywords:
Downside risk
Emerging markets
Risk exposure and returns

ABSTRACT

Distributional properties of emerging market returns may impact on investor ability and willingness to diversify. Investors may also place greater weighting on downside losses, compared to upside gains. Using individual equities in a range of emerging Asian markets, we investigate the potential contribution of downside risk measures to explain asset pricing in these markets. As realized returns are used as a proxy for expected returns, we separately examine conditional returns in upturn and downturn periods, in order to successfully identify risk and return relationships. Results indicate that co-skewness and downside beta are priced by investors. Further testing confirms a separate premium for each measure, confirming that they capture different aspects of downside risk. Robustness tests indicate that, when combined with other risk measures, both retain their explanatory power. Tests also indicate that co-skewness may be the more robust measure.

1. Introduction

The purpose of this paper is to explore whether measures of downside risk contribute towards an explanation of the risk/reward relationship for individual shares in emerging Asian markets. The notion that measures such as co-skewness and downside beta should matter to investors is well established in the literature. Kraus and Litzenberger (1976) show that utility functions with non-increasing absolute risk aversion imply a preference for positive skewness. Huang and Litzenberger (1988) demonstrate that the risk premium on assets will depend on their co-skewness, with investors preferring assets with positive co-skewness. The rational Disappointment Aversion (DA) utility function attributed to Gul (1991) implies that investors display a larger aversion to losses relative to the attraction for gains. Ang et al. (2006a) demonstrate how, in a DA utility framework, cross sectional asset pricing will incorporate a premium for downside risk measures such as downside beta. Emerging markets merit separate examination, as there is evidence that asset returns exhibit very high volatility and are not normally distributed (Bekaert and Harvey, 1997). Bekaert et al. (1998) identify significant skewness and kurtosis in emerging market returns, and they observe the persistence of skewness over time.

Co-skewness of returns is our primary measure of downside risk. Using individual share data, Harvey and Siddique (2000) find that co-skewness has explanatory power for share returns, after allowing for other established explanatory factors. Downside beta is a further indicator of downside risk. Ang et al. (2006a) provide a detailed empirical examination of the explanatory power of downside beta for individual shares in the US market. They show that the shares which co-vary strongly with the market during market downturns do have higher average returns. Pedersen and Hwang (2007) also demonstrate that downside beta will explain a higher proportion of individual UK share returns than will beta alone.

The issue of downside risk in emerging markets has already been addressed in the literature. Studies so far have examined this issue at aggregate market level, but not at the individual firm level. Estrada (2002) uses market indices to provide evidence on the explanatory power of downside beta. Using a measure developed from the comparison of investment returns with market portfolio returns, when each is below their respective means, he reports stronger results than for beta. When compared with downside beta, Galagedera and Brooks (2007) find that co-skewness is the better explanatory variable of emerging market monthly returns. Galagedera (2009) also reports that, when compared with beta and downside beta, co-skewness is a better measure of risk. However, when assessing developed market indices, he finds that both downside risk measures perform poorly when compared to beta.

Using daily data from emerging Asian markets, we present a series of empirical examinations of whether downside risk is

* Corresponding author. Tel.: +353 1 716 8827; fax: +353 1 283 5482.
E-mail addresses: Lakshman.Alles@cbs.curtin.edu.au (L. Alles), Louis.Murray@ucd.ie (L. Murray).
[1] Tel.: +61 8 9266 7811; fax: +61 8 9266 3026.

0378-4266/$ - see front matter © 2013 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.jbankfin.2013.02.006

independently priced in cross-section. We exclude Singapore and Hong Kong, as they would not normally be categorized as emerging markets. We also limit our investigation to eight markets, as remaining markets in this region are so small that they have relatively few actively traded shares. For our investigation, we compare realized returns of individual companies with individual risk measures computed in each market. As realized returns are a proxy for expected returns, we analyze returns during market downturns separately from market upturns. Our results offer a significant contribution to the unraveling and understanding of risk measures in emerging markets and the manner in which investors are rewarded for assuming those risks. In outline, we find that investors in emerging markets are clearly rewarded for exposure to both co-skewness and downside beta. Control tests confirm a separate premium for each, indicating they capture different aspects of downside risk. When combined with other risk measures, both co-skewness and downside beta retain explanatory power. There is however some evidence that co-skewness may be a more robust measure, as it tends to retain greater significance.

Our paper proceeds as follows. In Section 2 we outline details of the markets included in the study, we also address the issue of thin trading and share selection. Section 3 describes the research methodology. A separate sub-section models expected relationships between exposure to risk measures and investor returns. Section 4.1 presents an assessment of relationships between individual downside risk measures and returns, Section 4.2 offers the results of control tests on the potential impact of interrelationships between risk measures, and Section 4.3 contains results of regression tests on the explanatory power of risk measures, when in combination. Section 5 concludes.

2. Data and markets

Data from eight emerging national equity markets in the Asia Pacific region are included. These are China,[2] India, Indonesia, Malaysia, Pakistan, Taiwan, Thailand, and South Korea. All data comes from Thomson Data-stream. Daily prices for firms on each market are gathered over the ten year period from June 1st 1999 to May 31st 2009. Market capitalization is taken as the measure of company value, and annual values are also gathered for all firms. The measure of short-term interest rates for each market is as follows: the interbank overnight repo rate (China); the overnight call rate (India); the interbank call rate (Indonesia); the daily interbank rate (Malaysia); the KIBOR overnight rate (Pakistan); the daily overnight rate (South Korea); the overnight interbank rate (Taiwan); and the interbank overnight rate (Thailand). All national market indices are DS indices, they offer an estimate of dividend adjusted returns.[3] They are value weighted, and they cover a minimum of 75% of total market value. Company value and data availability determines inclusion in the index, and the largest value companies in each market are selected.

Table 1 presents outline summary information on these markets. Values are from June 1st 2008, the beginning of the final year of data in our study. Total number of companies listed in each market is indicated, and market capitalization of all listed companies is the measure of total market value. Total market values, average values, and median values are detailed in both local currency and in US $s, using currency exchange rates on this date.

Using either total value or average value as a measure, we note differences in scale between markets. After a period of sustained growth, the Chinese 'A' list market is largest, however the Indian market is of similar scale. Korea and Taiwan form a second group, as all remaining markets are considerably smaller. A comparison between mean and median values indicates the extent of domination by the biggest companies in each market. The Chinese market has the least skewed distribution of sizes, and most closely resembles the patterns observed in developed markets. To a lesser extent, India and Taiwan also exhibit a pattern of sizes that is close to that in the developed markets. All remaining markets are dominated by small numbers of large companies. We indicate the proportion of total value represented by the largest 20% of all companies in each market.

An obvious concern is that, since there are large numbers of small thinly traded shares in emerging markets, an accurate estimation of their risk attributes will not be possible. We therefore limit our investigation to the largest 20% of firms listed in each market, as this should reduce the influence of very small companies and curtail the impact of non-synchronous trading on estimated risk measures.[4] This sample selection should also ensure that similar proportions of each market are included. As indicated in Table 1, the firms in our sample represent in excess of 80% of total market value, in all eight markets. They will also be the firms of most interest to investors. Using market capitalization on June 1st, all firms are ranked every year, and the largest 20% in each market are selected. A further selection criterion is employed, as even relatively large companies may suffer a lack of liquidity (Feldman and Kumar, 1995). For all shares, in every year, we estimate the proportion of days with zero returns. Lesmond et al. (1999) propose this is a useful measure of transaction costs, it also provides a good approximation of the extent of thin trading. We specify 50% of zero returns as the maximum cut-off. Only those shares recording a proportion of zero daily returns below 50% are included when selecting the largest firms from each market. This second criterion results in the exclusion of a small number of larger companies.[5]

The study period covers ten years, from June 1st 1999 to May 31st 2009. Because of the desirability of a long study period, the possibility of extending back before 1999 was considered. During the 1990s, there has been rapid growth in overall size, and in the number of shares quoted in these markets. Levels of trading of individual shares have also increased. Had an earlier start date been selected, the number of companies meeting the minimum criterion percentage of zero daily returns is considerably lower, requiring a reduction in the proportion of each market included in our study sample, or a reduction in the number of national markets in our study. Our choice of start date therefore represents a compromise.

3. Methodology

3.1. Risk measures

Because all risk measures vary depending on the time horizon over which they are estimated, and also because actual risk exposures alter over time, we adapt the approach of Kothari et al. (1995). All are estimated over a 12 month horizon, from June

[2] We only consider 'A' list shares, quoted in China. We also do not distinguish between the Shanghai and Shenzhen markets.

[3] Details on the construction of DS (Data-stream) Indices are available in 'The Datastream Global Equity Indices User Guide, Thomson Financial Limited 2003. The return index represents the theoretical growth in value of a notional stock holding, the price of which is that of the selected price index. This holding is deemed to return a daily dividend, which is used to purchase new units of the stock at the current price. The gross dividend is used. Full details on the construction of DS return indices are available in the user guide (page 20).

[4] We believe that this screen filters out the potential data problems associated with small firms, identified in Ince and Porter (2006).

[5] Levels of thin trading in the smaller markets and also in the Thailand market are such that it would not have been possible to include more than twenty percent of shares in these markets, without including companies that do not meet the criteria of less than 50% zero returns.