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The performance of moving average rules in emerging stock markets

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Abstract

The question of whether active trading strategies outperform the more naïve approaches that are available to investors has returned to the research agenda. The topic had been hotly debated in the early and middle 1960s, but seemed to have been dispatched to the academic sidelines by proponents of the Efficient Market Hypothesis (EMH). However, the developments in behavioural finance which recognize that individuals may make mistakes when valuing securities have revived interest in this topic. In addition, recent evidence has re-ignited the debate and there is now a new strand of literature which re-examines whether trading strategies based on historic information can yield profits. The current article builds on this recent body of evidence by examining moving average rules for 15 emerging and three developed markets over the period 1989–2003. The results indicate that the return behaviour of the emerging markets studied differed markedly from that of their developed market counterparts;

moving average rules were more profitable when tested using emerging stock market indices. In addition, this profitability persisted for longer moving averages, suggesting that trends in share returns were larger and more persistent in emerging markets.

Notes

[1] A number of heuristics are said to be employed by all decision-makers. For example, according to the representative heuristic, individuals generalize about an event by reference to how representative it is of similar events in their past experience. According to the anchoring heuristic, individuals arrive at estimates by starting from an initial value and then making adjustments upwards or downwards to yield a final answer. Individuals are also prone to the available heuristic whereby they assess the probability of an event by the ease with which instances or occurrences can be brought to mind (Kahneman and Tversky, 1982).

[2] For a review of the developments in behavioural finance, the reader is referred to Van der Sar (2004).

[3] Given the focus of this study, only the literature pertaining to moving average rules is reviewed. A more detailed review of the different literatures can be found in Elton and Gruber (1995).

[4] Van Horne and Parker (1967) also examined the performance of a modified version of this rule where the moving average was weighted to place greater emphasis on more recent prices. However, this modification earned less profit than its unweighted counterpart in every instance. A follow-up article by Seelenfreund et al. (1968) employed a quadratic approach to smooth prices but again reached the same result that the buy-and-hold approach dominated the trading rule, especially once commission costs were taken into account.

[5] Brock et al. (1992) tested 10 variations of the moving average rule: (1, 50, 0), (1, 50, 1), (1, 150, 0), (1, 150, 1), (5, 150, 0), (5, 150, 1), (1, 200, 0), (1, 200, 1), (2, 200, 0) and (2, 200, 1).

[6] The moving average rules examined were the same strategies that were assessed by Brock et al. (1992).

[7] The rules examined were (1, 50, 0), (1, 100, 0), (1, 150, 0), (1, 200, 0), (2, 100, 0), (2, 150, 0), (2, 200, 0), (5, 200, 0) and (1, 50, 1).

[8] In this study, the number of buy and sell signals was very similar for three of the four exchanges studied and, for the Variable Length Moving Average rules, the majority of both buy and sell returns were statistically significantly different from those earned by following a buy-and-hold strategy. These findings differ from the conclusions reached by other studies (Brock et al., 1992; Hudson et al., 1996; Coutts and Cheung, 2000). In these studies, the number of buy signals was greater than the number of sell signals (suggesting a bullish market) and sell signals were the most powerful for prediction purposes.

[9] Specifically, the authors examined daily index prices for Argentina, Brazil, Chile, India, Korea, Malaysia, Mexico, Philippines, Taiwan and Thailand.

[10] In this study, Ratner and Leal examined the same 10 Variable Length Moving Average rules as Brock et al. (1992). A key difference between these studies is the interpretation of the band. While Brock et al. (1992) and indeed most studies which examine moving average rules, evaluated each rule with a trading band around the returns, Ratner and Leal employed a trading band around the Standard Deviation (SD). This resulted in more conservative findings. For example, without the band, 50 of the 60 trading strategies had buy signals greater than sell signals as compared to only 37 strategies when the band was included.

[11] Indices were selected for examination rather than individual shares because of data availability and thin trading problems. Specifically, data for individual securities could not be obtained for all of the sample markets stretching back to 1989. In addition, any individual security price information might have been inappropriate for analysis because shares in emerging markets tend to be thinly traded. The index data employed in the current study have been widely used in other studies and should aid the comparison of the findings of the present research with the results from other investigations. Of course, the use of index data may cause practical problems in terms of the exploitability of any findings since some of the indices employed in this article may not be tradable. Nevertheless, these IFC indices are broadly based, usually encapsulating over 60% of the market value of all securities traded within a country. In

particular, the most liquid securities are selected for inclusion within the index by the IFC; these would be the shares that would be of most interest to UK investors. In addition, the analysis should supply some insight into the theoretical levels of efficiency of the markets covered.

[12] In an analysis of trading strategies in 11 European stock markets, Fifield et al. (2005) concluded that no single trading rule could persistently exploit predictable behaviour in share prices, 'since the profitability of the different rules examined varied dramatically from market to market' (p. 17). Most practitioners would argue that a substantial amount of background knowledge is required before attempting to apply any moving average rule to a specific country index.

[13] The variations examined were (1, 50, 0), (1, 50, 1), (1, 150, 0), (1, 150, 1), (5, 150, 0), (5, 150, 1), (1, 200, 0), (1, 00, 1), (2, 200, 0) and (2, 200, 1).

[14] The cost per trade information for Argentina, Chile, India, Korea, Malaysia, Mexico, the Philippines, Taiwan, Thailand, Japan and the United States is taken from Ratner and Leal (1999). The estimates of transaction costs in the United Kingdom are from Hudson et al. (1996), and costs in Indonesia are from the Standard and Poors (2005). All remaining estimates come from information on the countries stock exchange website (Jakarta Stock Exchange, 2001). In particular, information on transaction costs for Hong Kong are from www.hkex.com.hk, for South Africa from www.jse.co.za, for Sri Lanka from www.lanka.net, for Turkey from www.ise.org and for Zimbabwe from www.zse.co.zw.

[15] The analysis reported in this article was undertaken in foreign currency terms. That is, the article adopts a UK perspective, rather than a local perspective, in order to measure the gains that could accrue to UK institutional investors who employ moving average rules to exploit any predictability in share prices. However, the analysis was also undertaken in 'local' returns unadjusted for currency movements against sterling. The results from this further analysis were not different in character from those arising from using the sterling-adjusted returns which are reported here. In particular, both the sign and the size of the return to each trading strategy were broadly similar. Results based upon local currency returns are available from the authors on request.

[16] There are nine different moving average strategies involving long runs of 50 days: (1, 50, 0), (1, 50, 1), (1, 50, 5), (5, 50, 0), (5, 50, 1), (5, 50, 5), (10, 50, 0), (10, 50, 1) and

(10, 50, 5). Given that long-run periods of 100, 150 and 200 days are also examined, the total number of strategies studied is 36.

[17] Closer investigation of the UK results shows that none of the 36 moving average rules outperformed the buy-and-hold strategy. The largest value for the rule profit (5, 50, 5) was only 63.84%, as compared to 210.62% following the buy-and-hold strategy. Similarly, for the United States, all 36 moving average rules failed to better the returns from following the buy-and-hold strategy. For example, the largest rule profit (5, 50, 1) was 182.02% as compared to 364.53% for the corresponding buy-and-hold strategy. Results for the individual rules are available from the authors on request.

[18] This finding holds for all 36 variations of moving average rule studied.

[19] There are several reasons which could explain the success of the moving average rule in Japan. For example, since the early 1990s, Japan's economy has faced its worst slump since World War II. Problems such as low demand, deflation, bankruptcies and bad debt burdens in the banking sector have plagued the economy that used to rank among the top three in the world. Given such difficulties in the macroeconomy, it is little wonder that the security market is suffering. Presumably, the long downward trend in Japanese security prices is being exploited by the moving average rule to yield profits. However, attempts are being made to reform the financial system in the hope that the economy can be reactivated through an increase in the efficiency of the market (Financial Times, 2003). However, although the poor macroeconomic performance of Japan may be a plausible reason for the success of the moving average strategies, Bessembinder and Chan (1995) reported that the moving average rules were successful in predicting share price movements in Japan during an earlier period from January 1975 to December 1989, when a bull market was present. This finding suggests possible inefficiencies in the market and further investigation is warranted.

[20] At 100 days, 12 emerging stock market countries have rule profits that are greater than the buy-and-hold profits (Chile, Indonesia, India, Korea, Malaysia, Mexico, the Philippines, Sri Lanka, Taiwan, Thailand, Turkey and Zimbabwe), while at 150 days, nine emerging stock market countries have rule profits that are greater than the buy-and-hold profits (Chile, Indonesia, Korea, Malaysia, the Philippines, Sri Lanka, Taiwan, Thailand and Zimbabwe).

[21] Over all four long-run moving averages, the profits from the trading rule are less than those from following the buy-and-hold strategy in two countries (Argentina and

Hong Kong). It is not so easy to segregate the results for four emerging market countries. For example, India and Mexico have successful mean moving average results over two long-run periods, while South Africa and Turkey have successful mean moving average results over one long-run period, with the buy-and-hold profit exceeding the moving average profits for the other three long-run periods.

Related Research Data

An analysis of trading strategies in eleven European stock markets
Source: European Journal of Finance
Tests of technical trading strategies in the emerging equity markets of Latin America and Asia
Source: Journal of Banking & Finance
Effectiveness of simple technical trading rules in the Hong Kong futures markets
Source: Applied Economics Letters
RELATIVE STRENGTH AS A CRITERION FOR INVESTMENT SELECTION
Source: The Journal of Finance
Testing for predictability in emerging equity markets
Source: Emerging Markets Review
Random Walks: Reality or Myth
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