

# Common trends and convergence? South East Asian equity markets, 1988–1999

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## Abstract

This paper uses two different estimation approaches to demonstrate that equity markets in South East Asia have shown signs of converging during the 1990s. According to the Haldane and Hall (*Economic Journal* **101**, 436–443, 1991) method of measuring convergence, a subset of Asian markets had converged by mid-1997. This process appears to have been abruptly halted and somewhat reversed by the recent financial crisis. We find that in general, there are two common trends present in the eight Asian equity market indices modeled here, and also two trends when the US market is additionally included in a Johansen VAR. © 2002 Elsevier Science Ltd. All rights reserved.

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## 1. Introduction

The existence of low correlation among returns from different national stock markets has been used frequently to justify the international diversification of portfolios (see for example Levy and Sarnat, 1970; Grubel and Fadner, 1971; Lessard, 1973; Solnik, 1974,1991). More recent studies have concentrated on volatility spillovers among markets and have examined changes in these spillovers over time. There are clear variations in methodology used to analyze volatility spillovers, see Bollerslev et al. (1992), Koutmos and Booth (1995), Booth et al. (1997) and Kanas (1998) for a brief selection. A number of authors have demonstrated that these spillovers vary

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systematically over time. Indeed, Koch and Koch (1991) and Longin and Solnik (1995) concluded that markets have become more internationally interdependent over time.<sup>1</sup>

Studies have investigated both ‘mature’ equity markets and so-called ‘emerging’ markets, including several South East Asian markets considered in the present paper<sup>2</sup>. Many have investigated the effect of the October 1987 stock market crash on equities in ‘emerging’ markets: see for example Lee and Kim (1994) and Choudhry (1996, 2000). Unfortunately, there appears to be little common ground between these paper’s findings. Many ‘emerging markets’ have been subject to financial deregulation; nevertheless, Ng et al. (1991) and De Santis and Imrohorglu (1997) also fail to reach a consensus on the impact of liberalization on volatility. However, Manning (1999) finds evidence of an increase in equity market volatility and in volatility spillovers among Indonesia, Singapore and Malaysia when comparing the 1997/98 ‘crisis’ period with the pre-crisis 1990s. In view of the preceding discussion and the financial turmoil affecting the region in 1997, further work on South East Asian markets seems justified.

The above has almost exclusively been concerned with returns and volatilities in different markets. These are essentially *short-run* phenomena. However, a related strand of the literature considers *long-run* relationships among different equity market indices and whether there is any tendency for *convergence* to occur over time. Most of the recent work in this area has taken into account the unit root property commonly found in equity prices and thus cointegration methods have frequently been applied to multi-country equity market data. For example, Kanas (1998) concludes that the lack of bivariate cointegration between the US market and any European bourse implies gains to international portfolio diversification,<sup>3</sup> which takes us back to the arguments of Levy and Sarnat (1970) and others, some two and a half decades previously.

Other papers have applied cointegration techniques to ‘emerging markets’, including those in southeast Asia. Huang (1995) demonstrates that the indices from southeast Asian markets possess unit roots but, in common with Pan et al. (1991), rejects the random walk hypothesis for a number of Asian markets. Chan et al. (1992) also find evidence of unit roots in major Asian markets and find no evidence of cointegration between the Asian markets and the US, or among the various Asian markets themselves.

One classic paper considering the long-run relationship among indices is Kasa (1992), who applied the Johansen (1988) *Maximum Likelihood* approach to stock market data from the US, Japan, Canada, Germany and the UK. The paper is notable for demonstrating that indices from five markets can be approximated by a single

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<sup>1</sup> Others, such as Bertero and Mayer (1990), King and Wadhvani (1990) and King et al. (1994) argue that the correlation between returns to different national equity markets actually increases in times of general market turbulence. See also Choudhry (2000).

<sup>2</sup> See Solnik (1991) for a study of South East Asian markets.

<sup>3</sup> However, Kanas (1999) illustrates that the UK and US markets are cointegrated over the post-crash period 1987–96, although not cointegrated over the periods 1983–96 or 1983–87.

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