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Integration versus segmentation in China's stock market: An analysis of time-varying beta risks



Hong Li*

School of Contemporary Chinese Studies, The University of Nottingham, United Kingdom

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ABSTRACT

This paper assesses whether China's stock market is integrated with the global market during 2000–2010 within the framework of an augmented CAPM. We firstly use Kalman smoothing technique to obtain time-varying global and national systematic risks for the once-restricted A- and unrestricted B-share indices in China's stock exchanges. Then we investigate how these risks are priced while controlling for possible structural changes using the Markov regime-switching technique. We find evidence of partial integration in terms of positively priced global and national systematic risks in most cases. However, the unrestricted Shanghai B-share market is found to be generally segmented from the global market. The degree of integration is therefore not simply a matter of the degree of restriction, confirming that documenting barriers to investment (or the lack of them) is insufficient to prove segmentation (or integration). Given that the domestic systematic risk is still priced, there is scope for international portfolio diversification into China.

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1. Introduction

It is widely accepted that the issue of whether stock markets are integrated or segmented has implications for financial decisions. Bekaert et al. (2003) summarise that the extent of market integration affects the functioning of equity markets and the diversification ability of local and foreign investors. If a national stock market is segmented from global markets, international investors can gain from risk

* Corresponding author. Tel.: +44 0115 8484148; fax: +44 0115 8463324.
E-mail address: hong.li@nottingham.ac.uk

diversification through portfolios that include stocks traded in this market. On the other hand, from a domestic perspective, such segmentation can require domestic firms to explicitly consider global versus local sources of funds and global versus local hedging opportunities. However, the institutional changes that accompany integration with the global market can lead to positive spill-over into the real economy, by improving corporate governance and reducing the cost of capital, which can in turn increase investment and economic growth.

Since the early 1990s, the Chinese authorities have implemented various reforms in their stock exchanges in order to reap the benefits of integration. According to statistics compiled by *International Financial Service London* (2010), external portfolio investment into China in 2008 was \$10bn, in contrast to an overall outflow of \$80bn of external portfolio investment from emerging economies in that year. Given that China has become one of the largest recipients of external portfolio investment among the emerging markets, it is of great interest for international investors to assess whether the Chinese stock market has become integrated with the world market in order to gauge potential gains from portfolio diversification into China. From the academic perspective, China provides an interesting case study. The existence of dual classes of stocks, namely the once-restricted A-shares (shares became available to foreign investors in 2002) and unrestricted B-shares (shares available to foreign investors throughout the period under study), will facilitate the evaluation of the effects of capital controls, providing important policy implications for other emerging markets.

Many studies have attempted to investigate China's stock market integration through cointegration analysis of stock indices or correlation/dependence analysis of stock returns. *Girardin and Liu* (2007) suggest a long run international financial integration on the basis of cointegration between the weekly averaged Shanghai A-share and S&P 500 indices during 1992 and 1996 and between the weekly averaged Shanghai A-share and Hang Seng indices since 1997. *Johansson* (2009) concludes that China experienced an increasing level of integration with several major financial markets in the 2000s on the basis of the market dependences estimated by Copulas. However, *Lin et al.* (2009), using a dynamic conditional correlation GARCH model, find that the Chinese A-share market has never been correlated with overseas markets during 1992 and 2006 while its B-share market exhibits negligible correlations with the western markets and slight correlations with the Asian markets. *Luo et al.* (2011) investigate dependences between financial sectors in China and some overseas economies within the framework of a copulas model. They find significant dependences between China and Hong Kong and Singapore, weak dependences between China and Australia, Taiwan and Japan and no dependence between China and Korea or the US in the post-2002 period. Similarly, *Li* (2012), using a multivariate GARCH, finds that the interdependences between China and the regional markets increase but the conditional correlation between China and the US market remains weak during 1992 and 2010. The above studies are informative indeed with respect to stock market linkages and interdependence between China and the regional and global economies. However, *Girardin and Liu* (2007) admit that 'existence of a long run relationship between stock markets may not be a proof of integration but simply of cointegration of fundamentals' (p. 366). *Bekaert and Harvey* (1995) suggest that correlation between returns of the local and world markets cannot be used as a measure of stock market integration, because 'a country could be perfectly integrated into world markets but have a low or negative correlation because its industry mix is much different from the average world mix' (p. 436).

More relevant to our study is the strain of investigations in the context of asset pricing models. In an asset pricing sense, integration is defined as a situation where investors earn the same risk-adjusted expected return on similar financial instruments in local and global markets. Hence the investigation of market integration for a particular economy could, in principle, involve testing whether systematic risk relative to the global market is the only significant factor in a capital asset pricing model. However, the pure international CAPM has typically asserted market integration by assumption, making it an unsuitable framework for testing. *Stehle* (1977) conducts the first empirical test of segmentation versus integration in an international CAPM that is augmented by including a term to represent national systematic risk. Using the traditional two-pass approach, *Stehle* (1977) finds that the pricing of US securities is significantly related to a global market portfolio. Within the same framework of this augmented CAPM, *Jorion and Schwartz* (1986) use a maximum likelihood approach to estimate all the parameters simultaneously and find strong evidence of segmentation in the pricing of the Canadian stocks relative to the North American market during 1963–1982. *Mittoo* (1992) re-examines the

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