Equity market integration in the Asia Pacific region: Evidence from discount factors[☆]

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ABSTRACT

The paper investigates stock market integration among 10 economies in the Asia Pacific region over the period April to May 2006 based on a recently developed technique that relies on estimating expected discount rates; see Flood and Rose (2005a,b). The results show a limited but varying degree of stock market integration among the 10 economies. Membership in a formal economic organization does not seem to affect the degree of integration.

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1. Introduction

This paper investigates stock market integration among 10 economies in the Asia Pacific region based on a recently developed technique by Flood and Rose (2005a,b). Investigating international stock market integration is useful both from a financial and an economics point of view. A large body of literature has emerged on the macroeconomic gains of international financial integration mainly through the channel of international risk sharing; see for example the seminal work of Obstfeld (1994) and more recent studies by Wright (2005), Gourinchas and Jeanne (2006), Bekaert et al. (2006), and Morgan and Snowden (2007).

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Most empirical studies that test for integration can be grouped into two categories. The first are studies employing financial economics models, such as explicitly estimating capital asset pricing models (CAPM), analyzing return and volatility spill-overs between markets in a GARCH model framework or use a latent factor model framework; see, for example, Chung and Rhee (2002), Bekaert et al. (2005), Jeon et al. (2006), and Hardouvelis et al. (2006). The second category are studies employing times series tools such as cointegration analysis, bivariate and multivariate, vector autoregression (VAR) analysis including those allowing for error correction terms; see, for example, Dickinson (2000), Ng and Siklos (2001), and Masih and Masih (2002). The results have been mixed, with some studies finding stock market integration within the Asia Pacific region while others find some segmentation; see Ng and Siklos (2001) and Johnson and Soenen (2002) for supporting evidence for integration and Yang et al. (2003), Click and Plummer (2005), and Jeon et al. (2006) supporting evidence for segmentation. The one point studies do seem to agree on though is that integration has been increasing over time, particularly since the Asian financial crisis of 1997.

This paper takes a step back from the more traditional empirical methods and applies a recently developed technique by Flood and Rose (2005a,b). The idea is that, in integrated markets, assets are priced by the same stochastic discount factor (SDF). Expectations of the marginal rate of intertemporal substitution are estimated for each of the 10 economies. Similar estimates point to integration while dissimilar estimates indicate stock market segmentation. Comparing expected discount rates is only a weak test for integration as it tests a necessary but not sufficient condition for asset market integration. Passing the test may imply integration but rejection implies segmentation.

The paper applies the technique to daily data in 2006. The choice of date was driven by the desire to utilize the most recent observations as stock market integration in the Asia Pacific regions is on a rising path but to also steer clear of the global financial crisis that had its beginning with the collapse of the sub-prime mortgage market in the United States in February 2007. The paper focuses on integration, links between stock markets in "normal" economic times rather than contagion which refers to links in crisis periods over and above normal links.

Analyzing stock market integration in the Asia Pacific region is a particularly interesting exercise because the region covers a variety of economies. It includes developed economies such as Australia and Japan, the export-led growth Asian tigers of Hong Kong, South Korea, Singapore and Taiwan as well as emerging economies such as India and Thailand. The countries within the sample also display varying degrees of direct and possibly indirect barriers to capital flows with New Zealand displaying virtually no and Malaysia some formal capital controls.[1]

Varying degrees of formal frameworks apply to the different economies which is expected to affect integration. All are members of the World Trade Organization (WTO), all barring India are part of the Asia-Pacific Economic Cooperation (APEC), and Malaysia, Singapore, and Thailand are members of Association of Southeast Asian Nations (ASEAN). The WTO has the loosest framework of formal cooperation while ASEAN has the tightest with the goal of creating a single market.[2]

Tables 1 and 2 give an indication of the diversity of the region. Tables 1 shows that Japan is the largest economy in the Asia Pacific region, in terms of share of gross domestic product (GDP) in world and regional GDP (columns 2 and 3) and the most developed in terms of GDP per capita (column 4). India is a relatively large economy with large shares in world and regional GDP but it is also the least developed economy with the lowest GDP per capita in the sample. There are also large differences in trade dependency indicated by the share of total trade in GDP (column 5). The sample includes ultra-open economies such as Singapore, Malaysia, and Hong Kong with trade as a share of GDP between 200 and 400 per cent and more closed economies such as India and Japan with trade share of 38 and 26 per cent of GDP.

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[1] See Sivalingam (2008) for a discussion of the post 1997 financial reforms in Malaysia.
[2] See Park (2007) for a detailed analysis of recent developments, including the Chiang Mai Initiative, and future prospects for regional financial and monetary cooperation and integration in East Asia, particularly in ASEAN + 3 (ASEAN + China, Korea, and Japan).