Journal of Financial Economics 65 (2002) 203–247
JOURNAL OF Financial ECONOMICS
www.elsevier.com/locate/econbase

Dating the integration of world equity markets ☆

Geert Bekaert[a,d], Campbell R. Harvey[b,d,*], Robin L. Lumsdaine[c,d]

[a] *Columbia University, New York, NY 10027, USA*
[b] *Duke University, Durham, NC 27708, USA*
[c] *Deutsche Bank AG, London, EC2N 2DB, UK*
[d] *National Bureau of Economic Research, Cambridge, MA 02138, USA*

Received 8 June 2000; received in revised form 12 August 2001

Abstract

Regulatory changes that appear comprehensive will have little impact on the functioning of a developing market if they fail to lead to foreign portfolio inflows. We specify a reduced-form model for a number of financial time series and search for a common, endogenous break in the data generating process. We also estimate a confidence interval for the break. Our endogenous break dates are accurately estimated but do not always correspond closely to dates of official capital market reforms. Indeed, the endogenous dates are usually later than official dates, highlighting the important distinction between market liberalization and market integration.

JEL classification: G15; G18; G12

Keywords: Market liberalization; Structural break tests; Portfolio flows; Endogenous break tests; Market reforms; Market integration

☆ We have benefited from discussions with and the comments of Martijn Cremers, Vihang Errunza, Lars Hansen, Andrew Harvey, Ming Huang, Luis Viceira, and seminar participants at Brown, Cambridge, Chicago, Darden, Erasmus, Maryland, Indiana, and New York University, as well as participants at the American Finance Association Meetings, the European Finance Association Meetings in Barcelona, and the Chazen Institute Conference on International Valuation at Columbia University. The paper has especially benefited from the detailed comments of the referee. We wish to thank Eric Engstrom, Andrew Roper, and Diego Valderrama, our RAs, for their help. This research was initiated while Lumsdaine was a National Fellow at the Hoover Institution. The opinions expressed are the authors' and do not represent those of Deutsche Bank or its affiliates.

*Corresponding author. Tel. +1-919-660-7768; fax: +1-919-660-8030.
E-mail address: cam.harvey@duke.edu (C.R. Harvey).

PII: S0304-405X(02)00139-3

1. Introduction

In financially integrated markets, domestic investors are able to invest in foreign assets and foreign investors in domestic assets; hence, assets of identical risk command the same expected return, regardless of trading location. Moving from a segmented regime to an integrated regime affects expected returns, volatilities, and correlations with world factors, all of which are important for both risk analysis and portfolio construction. Consequently, the concept of market integration is central to the international finance literature.

Market integration also plays a key role in international and development economics. International economists, however, focus on the potential welfare gains of market integration, in terms of risk sharing benefits (see Cole and Obstfeld, 1992; Lewis, 1996; van Wincoop, 1994). In the development economics literature, Obstfeld (1994), Bekaert et al. (2001a,b), and Henry (2000a) have started to trace the investment and growth benefits of financial market integration. The interplay between the financial sector and growth is examined in Devereux and Smith (1994) and Levine and Zervos (1996), among many others.

With the opening of so many emerging markets in the last decade, history now offers a unique experiment to explore the economic and financial effects of market integration. Not surprisingly, a literature has developed attempting to measure the macroeconomic and financial effects of market integration (see Bekaert and Harvey, 1995, 1997, 1998, 2000; Aggarwal et al. 1999; De Santis and İmrohoroğlu, 1997; Richards, 1996; Levine and Zervos, 1996; Kim and Singal, 2000; Henry, 2000a,b; Domowitz et al. 1997).[1]

But how do we measure the process of market integration? Indeed, how do we test the equilibrium models of risk sharing? How do we measure the growth effects of market integration? A prerequisite to these questions is the date that a market becomes integrated. The dating question is the subject of our research.

The dating of market integration is difficult. The capital market liberalization process is a complex process and it is unlikely that "dates" of capital market reforms will correspond to the true date of market integration. For example, there are often ways to circumvent capital controls. Investors can access markets indirectly through American Depositary Receipts (ADRs) or country funds, even though the market is technically closed to foreign investors. Liberalization may occur in stages and be a gradual process. Finally, some policy changes may be anticipated well in advance while others lack credibility.

There are potential solutions to these problems. One option is to specify a tightly parameterized model of the process of dynamic integration. For example, Bekaert and Harvey (1995) use a regime-switching framework to model gradual changes in market integration. However, these models are difficult to specify and are often statistically rejected. In addition, international asset pricing models typically fail to

[1] There is an older theoretical and empirical literature on market integration going back to Solnik (1974), Stehle (1977), Stulz (1981), Errunza and Losq (1985), Eun and Janakiramanan (1986), Jorion and Schwartz (1986), and Errunza et al. (1992).