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World and regional factors in stock market returns

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Abstract

Purpose – This paper aims to test the hypothesis that the national stock market returns are driven by a world factor, regional factors and idiosyncratic factors, and to measure the importance of each factor.

Design/methodology/approach – The state-space model is applied to describe the sample returns and estimate a world factor, regional factors and idiosyncratic factors by Kalman filtering. Weekly and daily returns calculated from MSCI country indexes from January 1988 to December 2004 of 11 national stock markets in four regions, i.e. North America (the USA and Canada), South America (Brazil, Mexico and Chile), Europe (the UK, Germany and France), and Asia (Japan, Hong Kong, and Singapore) are used.

Findings – The results support the hypothesis that national market returns are driven by a world factor, regional factors and idiosyncratic factors. National markets do not always respond mainly to the world factor; regional factors and idiosyncratic factors play important roles as well. They also respond to world news at a slower rate than regional news.

Research limitations/implications – This paper does not identify the source or origins of news directly but the factors are assumed as random variables and are estimated under certain strict assumptions.

Originality/value – This paper applies Kalman filtering to estimate a world factor and regional factors and test the importance of each factor directly, an extension of previous studies that mostly showed strong independence among markets.

Keywords Stock markets, Stock returns, World economy, National economy, Factor analysis

Paper type Research paper

1. Introduction

Returns in national stock markets exhibit strong interdependence (Jaffe and Westerfield, 1985 and Becker *et al.*, 1992). Investors follow news closely on how major markets react and apply this knowledge as part of their investment strategies in their interested stock markets. Researchers like Eun and Shim (1989), Becker *et al.* (1990) and Hamao *et al.* (1990) reported that the US market was the most influential market, and that the US market return was able to explain and predict other national market returns (e.g. Japan, the UK, Germany and Canada). However, the US market itself must react to some fundamental factors or news but they could react to these factors at a faster rate. This belief led researchers to further study economic variables or world news that might be able to explain the movements in national stock markets. Jorion (1990), King *et al.* (1994), Harvey (1995), Harvey *et al.* (2002), Shackman (2006),

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