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# The Dynamic Interdependence of International Financial Markets: An Empirical Study on Twenty-Seven Stock Markets

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## Abstract

In this paper, we aim to investigate the dynamic interdependence of international financial markets. Based on the data regarding daily returns of each market during the period 2006-2015 from Yahoo finance, we mainly focus on examining 27 markets from three continents, including Asia, America and Europe. By checking the dynamic interdependence between those markets, we find that markets from different continents have strong correlation at specific time shift. We also obtain that markets from different continents not only have a strong linkage with others at same day, but at a delay of one day, especially between Asia, Europe and Asia, America. In addition, we further analyze the time-varying influence strength between each two continents and observe that this value has abnormal changes during the financial crisis. These findings can provide us significant insights to understand the underlying dynamic interdependency of international financial markets and further help us make corresponding reasonable decisions.

**Keywords:** Dynamic Interdependence, Influence Strength, Minimum Spanning Tree, Cross Correlation

## 1. Introduction

With the rapid growth of globalization, one financial market may be highly associated with turbulence in other markets [1, 2]. The impacts of interdependent financial markets, especially stock markets, become more and more evident in turmoil market conditions [2, 3]. For example, in the 1987 U.S. market crash, the 1997 East Asian crises, the 1998 Russian collapse, and 2008 financial crisis, evidences have been found that dramatic movements in one financial market can have a powerful impact on other financial markets of very different sizes and structures across the globe [2-6]. This has generated a great deal of interest among the academic community on the interdependence of individual markets over time and across different markets [4, 7].

Studies regarding interdependence of financial markets, originating from the seminal work of Markowitz [8], posit that investors and policymakers can improve the performance of their portfolios by allocating their investments into different classes of financial securities according to the market linkages across countries [7, 9]. Correlation estimates are the crucial ingredient and the corresponding correlation measures are frequently employed in this domain [2]. By using these measures, existing work has investigated the potential benefits of international diversification and the superiority of portfolios [7, 10]. These findings demonstrate that market interdependence

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