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Analysis of the efficiency–integration nexus of Japanese stock market

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HIGHLIGHTS

- Japanese stock market data is multifractal in nature.
- Efficiency tends to be on an improving pattern over the decades.
- Recession damages stock market integration.

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ABSTRACT

This paper attempts a novel approach in analysing the Japanese economy through a dual-dimension analysis of its stock market, examining the efficiency and market integration. Taking a period of 24 years, this study employs MFDFA and MGARCH to understand how the efficiency and integration of the stock market faired during different business cycle phases of the Japanese economy. The results showed improving efficiency over the time period. For the case of market integration, our findings conform to recent literature on business cycles and stock market integration that every succeeding recession creates a break into integration levels resulting in a decrease.

1. Introduction

A country's stock market plays a prominent role in economic growth and development by encouraging savings and investments [1]. Furthermore, it enhances corporate governance and provides great opportunities for local and global diversification through effective and efficient asset allocation [2]. In his paper, Greenspan [3] discussed the importance of efficient financial systems as a means of providing a buffer against severe output contractions.

Many studies have argued that stock market performance is highly influenced by macroeconomic fundamentals. The link between them arises from the asset pricing models suggesting that expectations of future macroeconomic conditions would have significant influences on the stock market. The key connection between financial markets and macroeconomic volatility is predominantly explained based on the financial market imperfection model. Bernanke and Gertler [4,5] postulated a hypothesis known as the 'balance sheet view', which says that nominal and real shocks to an economy are augmented by a 'financial accelerator'.

Therefore, stock markets being a predictor for business cycles have long been accepted in literature [6–8]. However, some scholars do not agree that stock markets can be a predictor of economic activity. Barro [9], for instance, found that

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stock prices predicted three recessions for the years 1963, 1967 and 1978 that did not occur in the US, which were otherwise recorded.

The focus of this study is on the Japanese economy, as the world's third largest economy, Japan has come a long way from the devastating effects of World War II. Following a rapid and unprecedented growth in the 1980s, Japan faltered as the bubble economy burst in the 1990s leading Japan into its lost decade and yet again by the onset of the 2008 global financial crisis. Japan currently boasts a Gross Domestic Product (GDP) of $4.92 trillion (World Bank, 2013).

Japan's economy deteriorated at the hands of the asset bubble burst in late 1980s, which culminated into a full-blown crisis in 1997 following the crash of major financial institutions owing partly to the 1997 Asian financial crisis. The banking crisis, caused by excessive asset expansions, liberalization without adjusting regulations for a more open market [10], forced Japan to have massive reforms within the banking, public and private sectors, which allowed it to bounce back quickly. However, as Japan's economy was heavily dependent on foreign demand and information, the global decline in IT and the dot.com crisis led Japan into another recession.

The global financial crisis hit Japan in the midst of a long but lukewarm recovery. The Japanese stock markets reached a peak in 2007 and with the outbreak of the crisis, the stock market suffered a substantial decline. Exacerbated by the Lehman Brothers shock and the lagged impact of the negative terms of trade shock in 2008, the Japanese stock market and economy plummeted.

Analysing Japan's economy presents a particularly apt opportunity in understanding how stock markets are affected during different turns of the business cycle caused by major crisis events. Japan in particular is interesting, as despite its significant crises throughout the decades, it was able to bounce back with relative ease. Japan is awarded with highly skilled educated population (Japan in Figures, 2006) and was ranked 8th in competitiveness worldwide (World Economic Forum, 2010). At the same time, Japan also faces an ageing population, massive national debt owing to the global crisis and lacks significant natural resources (CIA World Factbook, 2009). This rise in momentous problems for the Japanese economy and the losing of economic eminence to China calls for more stringent policy changes to the economy and its stock markets.

The central aim of this paper is to analyse the Japanese economy and stock market via two distinct measurements. Firstly, we assess the weak form efficiency of the Japanese stock market in line with fluctuations in the economy. Secondly, we examine the integration of the Japanese stock market with the world average and its major trading collaborates, i.e. Asia Pacific and the Far East. Spanning a period of 24 years (1990–2014), this study aims at covering the prominent crises of Japan to understand the reaction of stock markets at those times.

This dual-dimensional approach is taken as it provides vital insight for regulators and global investors and has implications for investment strategies and theory for academic literature. Analysing the stock market on its efficiency is important to economist and policy makers alike as it helps in the efficient allocation of resources. The ranking of efficiency among stock markets has spurred into an important informational tool for regulators and policy makers, as it is critical in maintaining a well-functioning market, which contributes towards the overall growth and investment in the economy. Since its introduction by Fama [11], the Efficient Market Hypothesis (EMH) proposed that securities markets were extremely efficient in reflecting information about individual stocks and the market as a whole. This paper focuses on the weak-form of the EMH, which stresses that stock prices already reflect all the information that can be obtained from the market, such as past data, trading volume or short interest, implying that trend analysis would be redundant. This form of hypothesis holds that if information such as past stock price data conveyed reliable signals about future performances, all investors would be exploiting these signals, negating their value in the end as it becomes popular.

Weak form stock market efficiency becomes important to study as it benefits policymakers in avoiding misallocation of resources that would have a negative impact on long term economic growth. In addition, improving the efficiency of resource allocation channels allows a reduction in distortions in an economy. Previous studies on the Japanese stock market have revealed varied responses on the efficiency. Nagayasu [12] found evidence against the EMH, suggesting that market reforms post crisis did not produce major efficiency gains. However, Li [13] and Samaratunga [2] found that Japan's stock markets were efficient.

Similarly, financial integration also influences the volatility of business cycles, as integration among international markets intensifies the effects of existing distortions plaguing national financial markets [14]. Over the past decades, cross-border financial integration has increased significantly [15]; where around the same time as business cycles started synchronizing [16]. Furthermore, in the wake of the largest economic crisis since the great depression, many argue that financial linkages acted as a facilitator for its transmission. Johnson and Soenen [17] found that equity markets of Australia, China, Hong Kong, Malaysia, New Zealand, and Singapore are highly integrated with stock markets in Japan. Yang et al. [18] found that during the Asian crisis market integration of Asian market with Japan rose. Similar results were found by Masih and Masih [19] and Bessler and Yang [20].

Recently studies have extended the discussion on integration by delving deeper into short term and long term horizon integration levels. Masih and Masih [21] studied the dynamic causal linkages amongst international stock markets and found significant interdependencies between the established OECD and the emerging Asian Markets especially with US and UK as leaders in both short and long term. While in the same year, Roca and Selvanathan [22] found no differences in short and long term stock market integrations in the case of Australia, Hong Kong, Singapore and Taiwan. Ratanapakon and Sharma [23] while investigating regional Asian markets found that post Asian financial crisis the short and long-term integration increased amongst the sample. Recently, Jawadi et al. [24] inquired on Stock market integration in Mexico and Argentina with US and found no long term integration but traces in shorter horizon. Dewandaru et al. [25,26] has explored