Research on the Interaction and Linkage between Chinese and American Stock Markets

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Abstract

As globalization is deepening, the Chinese stock market is increasingly affected by other countries' stock markets. The interaction between the Chinese and American stock markets is particularly obvious and typical. Taking into account the history and background of the Chinese and American stock markets, this paper reveals the internal causes of stock market linkage between the two countries, analyses the different types of influencing factors, and summarizes previous studies on the linkage and interaction between the stock market of China and of the United States. Variables and models used, as well as the shortcomings and future implications of the previous studies, are indicated.

Keywords

American Stock Market; Chinese Stock Market; Interaction; Linkage

1. Introduction

With the development of technology, information on investments is constantly shared among countries. When making decisions, influencing factors of others countries' economic conditions are often taken into consideration. In the field of stock investment, in particular, research on the interaction among stock markets of different countries is of great importance. China's stock market is an important part of the country's market economy, which has a vital position in the world economy. With the continuous opening of China's economy, the economic changes in other countries will inevitably have various impacts and shocks on China's stock market. In order to maintain China's stock market and economic stability, Chinese scholars have devoted themselves to more systematic and detailed studies of stock market linkages. These studies will be significant to improving China's stock market and eliminating potential problems. This paper focuses on summarizing the research and achievements so far made by experts and scholars in this field.

2. History and background

2.1 History and development of American stock market

The New York Stock Exchange in the United States began in the late 18th century. At first, brokers traded in cafes on Wall Street. In 1811, brokers established the New York Stock Exchange according to the imperfect "Wutong Agreement" and began to operate. Compared with those of other European countries, such as the Netherlands and Britain, the stock market of the United States was established relatively late, but it is the most typical stock investment in the modern sense. After World War I, the New York Stock Exchange gradually became the largest and most important stock exchange market in the world. Most modern investment theories and economic theories originated in the United States. Considering the American stock market, we can get a general view of the development of modern stock investment and investment theory. The development of the American stock market is generally divided into four periods: 1. From the 18th century to 1886, the American stock market had initially developed. During this period, the American stock market was almost purely a speculative market. There was a serious phenomenon of manipulation in Wall Street transactions. 2. During 1886-1929, the American stock market developed rapidly. Although there were still many market manipulations and insider trading, the idea of investment had started to develop. 3. During 1929-1954, the American

stock market entered a period of standardized development and market manipulation. Although prohibited by legislation, information transparency and investor protection of listed companies had become the subjects of financial supervision, and the pension had become the main body of the market. During this period, the United States began to enter a real era of stock market investment, and value investment had become the mainstream investment idea. 4. Since 1954, institutional investors in the United States stock market have developed rapidly, and value investment ideas and growth investment ideas have gradually merged. The American stock market has become mature and stable.

2.2 History and development of Chinese Stock Market

Since the establishment of the Shanghai Stock Exchange in January, 1990, China has been exploring and developing a financial industry conforming to its national conditions and coordinating with its economic and social development. In December, 2010, China's stock market has reached a market value of 26 trillion yuan and has become the second largest stock market in the world. The development of China's stock market can be categorized into five periods. 1.In the first stage (1990-1991), China's stock market initially had the function of resource allocation. 2. In the experimental stage (1992-1997), the state conducted a pilot project of national debt options, but the form of subscribing stock still needed to be improved. 3. In the normative stage (1998-2001), a unified national securities regulatory system was established. CSRC was directly under the State Council. 4. In the period of transition (2002-2004), as the construction of China's stock market system entered the stage of legalization and as people's understanding of the stock market's function deepened, the status of the stock market had been elevated to an overall level of reform and development. 5. Since 2005, the stage of remodeling has started. In addition, the reform of non-tradable shares has been carried out to improve the quality of listed companies. Thoughout the process, China's stock market has undergone a gradual evolution—from one that plays basic roles such as a financing channel to one with high-level, complex functions such as adjusting the country's economic structure. However, there are still some problems towards China's stock market as it is continually growing, while the US stock market has become a mature, stable, and internationalized market. While the Chinese stock market in the process of continuous evolution and improvement, the American stock market is considered as a benchmark of economic activity and change.

3. Stock market linkage theory

3.1 Relevant Theory of Linkage Motivation

3.1.1 Spillover Effect

Due to the time difference between countries, the opening times of stock markets vary from country to country, which results in transmission of imformation based on time difference. Under this effect, information on investment is transmitted from coutries with stock markets opening earlier to those with stock markets that open later. This causes linkage between stock returns of different countries' stock markets. For instance, growth in one country leads to positive expectations, which causes growth in relevant sectors of other countries' stock markets. Lin, Engle & Ito (1994) and other mathematicians believe that this linkage is not unilateral, but is the result of interaction.

3.1.2 Economic Basis Theory

According to the theory of economic basis, if there are same, basic variables affecting the economies of different countries, then when external shocks occur, the stock market performances of these countries will converge. Solnik (1974) through the analysis of stock markets in several developed countries, it is found that there are some common macroeconomic basic variables that affect the stock markets of different countries at the same time. Later confirmed by Adler & Dumas (1983), Errunza & Losq (1985).

3.1.3 Market Contagion Effect

King &SWadhwani (1986) put forward the market contagion hypothesis in response to the lack of convincing explanation for the great fluctuation of the global stock market. The hypothesis holds that investors in the market will observe and use other market prices for reference when information is incomplete. That is to say, under the condition of information asymmetry, it is easier to produce a convergence effect and herding effect. Price fluctuations in one country's stock market can spread to other countries' stock markets. King & Wadhwani(1990) [1] uses the Dow Jones Index, the Nikkei Index, and the Financial Times Index to set up a model. The results show that when the economic situation, market structure, and expectations of each country are very different, the stock trend of each country tends to converge.

3.2 Relevant Theories of Measuring Stock Market Linkage

3.2.1 Stock Market Return Rate

For investors, the final investment decision is determined by the return on investment. The return rates of different stock markets and be compared and analyzed. This analysis is divided into two main streams: One is represented by Xasa(1992) ,Lin,Engle & Ito(1994), which takes the linkage of stock returns among countries as a model and uses the trading data of different periods to analyze the relationship between the returns of the present day and the next day. Another, represented by Rurstenberg & Jeon(1989) and centered on the US stock market, studies the predictability of future stock prices based on the stock market returns of other countries in the world.

3.2.2 Stock Market Volatility

Not only the stock market returns of each country, but also their volatilities, indicate linkages among the countries' stock markets. However, there are few theoretical studies on the causes of volatility changes. While most researchers consider the linkage between returns as the cause of volatility linkage, some scholars attribute it to the spillover effect of investment risk. Though explanation is insufficient, the volatility of stock market reflects investment risk and makes the price forecast more realistic.

3.2.3 Opening Price and Closing Price

Before conducting the yield linkage test, some scholars studied the linkage between Chinese and American stock markets based on daily closing prices. But if the opening price is also considered, the stock market returns of the day could be calculated, which is similar to the theoretical principle of using stock market yield to measure the linkage between stock markets of the two countries. Zhao Hua and XuJiao believe that due to asynchronous trading between the Chinese and American stock markets, direct use of the closing price model leads to erroneous results.

4. Linkage Influencing Factors

4.1 Event-like factors

Emergency economic events often affect the relationship among stock markets in different countries. The linkage among world investment markets tends to reduce the benefits of global portfolio transfer risk. By using the stock indices of the ten most important countries in the world, Hilliard (1979) [3] tests the linkage among stock price changes of major stock markets before and after the economic crisis. Linkage analysis is carried out and the results of Spectral Analysis proves that there is a close relationship among stock indices in different countries. Wang Zhifen, Zhang Xueling (2009) [4] studied the changes and causes of linkage between the Chinese stock market and American stock market before and after the subprime crisis.

4.2 Periodic Factors

Stock markets mirror their countries' social and macroeconomic conditions, which vary between different time periods. Thus, the linkage between the Chinese and the American stock market also changes depending on time periods. In the first ten years of the establishment of the Chinese stock market, the index changes have nothing to do with the international market. But with its reform and

opening up, the Chinese stock market is beginning to be affected by the peripheral stock markets. Yueying (2015) [5] chooses the Shanghai Composite Index from June, 2012 to September, 2014 and the Dow Jones Industrial Average Index to establish the VAR model and carries out the Granger causality test, impulse response, and other empirical analysis to study the linkage between the Chinese and American stock markets in the post-financial crisis era.

5. A Model for Measuring Linkage

Most scholars process data before establishing models. No matter if they use stock market return rates or other variables as a measure of linkage, if the data unstable, the follow-up empirical analysis would likely produce pseudo-regression, and the research results would be inaccurate and unconvincing. Therefore, the stationarity of the data shall first be tested via methods such as ADF unit root. Correlation coefficient reflects data correlation most straightforwardly, so it is also used to confirm the correlation between return and volatility of stock markets. But this method can only measure the linear relationship between variables, and does not indicate the causality. Therefore, most scholars use the Granger causality test to reveal the relationship between two variables or the dynamic relation between two variables under the interaction among multiple variables.

6. Other related research

The study of stock market linkage is of great significance to macro-economy. Domestic and foreign research change depending on economic environment and national policies, and research methods are constantly improving. Regarding the impact of event factors on the linkage between Chinese and American stock markets, Pan Jung(2013)[6] believes that the sub-prime mortgage crisis affects the linkage between the Chinese and American stock markets through trade, international hot money, and common expectations. Through verification by ARCH model and GARCH model, it is found that the change in stock market returns in the United States affects the change in stock market returns in China, but the reverse is not true. The Granger causality test indicates that the impact and volatility of the American stock market is reflected in China's B-share market, but not in the A-share market. On this basis, it is concluded that the linkage between Chinese A-share market and the American stock market is attributed to the spillover effect, while that between the B-share market and American stock market is due to the contagion effect. In the study of the linkage between the Chinese and American stock markets during the subprime crisis, Wu Jilin and Zhang Erhua (2010) [7] used the dynamic Copula equation of mechanism transformation and found that there was no contagion effect in the stock markets of China and the United States during the subprime crisis. Before that, Han Fei, Xiao Hui (2005) [8] studied the U.S. stock market from 2000 to 2004. The relationship between the opening and closing prices of the Chinese and American stock markets shows that the correlation between Chinese and American stock markets is weak.

In the study of the influence of period factors on the linkage between Chinese and American stock markets, Zhang Fu et al. (2004) found that before the opening of Chinese B-share market to domestic investors, there was no significantly common characteristics between the Chinese and American stock markets. After the opening of B-share market, however, the two stock markets had a balanced relationship. Liu Yueying(2015) obtained a unit of logarithmic return change of the Dow Jones Industrial Average Index on one day through VAR model, which would cause the logarithmic return of the Shanghai Composite Index to change 0.165013 units in the same direction on the next day, indicating that the Shanghai Composite Index and the Dow Jones Industrial Average Index are related in the short term. In addition, the US stock market has a unilateral impact on China's stock market in the short term. Zhao Hua and Xu Jiao (2010) confirmed that the influence of the American stock market on the Chinese stock market's opening is stronger than that of the Chinese stock market on the American stock market's opening. However, the interaction between the two stock markets during the opening of trading is insignificant, and there is no information transmission regarding return and volatility. Zhu Xiaoyong and Ren Xiaojie (2013)[9], through Granger causality test, concluded that

during the four times of quantitative easing monetary policy in the United States, the closing price of the previous day can be improved. The empirical analysis of Han Jiangxia (2011) reveals that although there is a long-term equilibrium relationship between the Chinese and American stock markets, there was no significant relationship between the Standard Poor's Index and the Shanghai Stock Exchange Index between 1999 and 2008. Xie Bai-san demonstrated that there is no significantly positive correlation between the Chinese and American stock markets in the long run through analysis of the macroeconomic trend, the degree of money liquidity, and the degree of market openness of the two countries. In addition, Gong Jinguo et al. (2015) [10], through empirical analysis, proved that the strengthening of stock market linkage between China and the United States is mainly due to the close trade exchanges between the two countries, but the macroeconomic differences between the two countries and China's financial liberalization reform have not significantly affected the linkage between the Chinese and American stock markets.

7. Conclusion

Current research focuses on influencing factors of stock market linkage between China and the United States, but there are few studies on how to deal with the negative effects of linkage. Although scholars have proposed methods to reduce negative implications based on their own research conclusions, there are few theories to verify them. Furthermore, in order to avoid data mismatch, scholars have eliminated inconsistent data, which to some extent concealed the real situation of the stock markets at the time of investigation. With economic globalization and China's reform and development, China's influence on the world economy is deepening. Under the background of supply-side reform, China's stock market is facing new challenges and urgently awaits new research and analysis by experts and scholars.

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