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The relationship between stock price index and exchange rate in Asian markets: A quantile regression approach

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ABSTRACT

This paper uses the data of six Asian countries to estimate the relationship between stock price index and exchange rate. According to the portfolio balance effect, these two variables should be negatively related. However, since the evidence from traditional ordinary least squares estimation is not favorable, the quantile regression model is adopted to observe the various relationships between stock and foreign exchange markets. The results show an interesting pattern in the relation of these two markets in Asia, which indicates that the negative relation between stock and foreign exchange markets is more obvious when exchange rates are extremely high or low.

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1. Introduction

This paper analyzes the relationship between stock price index and exchange rate in Asian markets. These two variables are both important in determining the development of a country. However, previous related studies have shown contrasting empirical evidence. Some studies have stated there are long-term equilibrium relation between stock price index and exchange rate (Ibrahim and Aziz, 2003; Kim, 2003). Other studies have stated that the relationship is short-term (Bahmani-Oskooee and Sohrabian, 1992; Nieh and Lee, 2001; Smyth and Nandha, 2003). Still other studies were unable to find evidence showing these two variables are related (Solnik, 1984; Ozair, 2006). Moreover,

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there are conflicts even in the studies that agree stock and foreign exchange markets are interconnected. Some propose that stock price index and exchange rate are positively related (Sevuktekin and Nargelecekenler, 2007), while others think the relationship should be negative (Soenen and Hennigar, 1988; Kim, 2003).

On the whole, the related literature discussing the theoretical foundation of the relationship between stock and foreign exchange markets can be divided in two directions: the international trading effect (Aggarwal, 1981) and the portfolio balance effect (Bahmani-Oskooee and Sohrabian, 1992).

Aggarwal (1981) believed that the connection between these two markets results from the influence of international trading. A change in exchange rate cannot only directly influence the stock prices of multinational and export oriented firms; it can also indirectly affect domestic firms. For a multinational firm, the change of exchange rates immediately influences the value of its foreign operations and continuously affects the profitability of the firm. Domestic firms are also influenced by the change of exchange rates, since they still may import their input and export their output.

When exchange rate depreciates, the competitiveness of exports will increase, and the input cost of imports will increase (Joseph, 2002). Thus, generally speaking, depreciation will cause positive (negative) effect for export (import) firms and increase (decrease) their stock prices; however, appreciation will cause negative (positive) effect for export (import) firms and decrease (increase) their stock prices. Since there are relatively more export-oriented firms in Asian countries (in other words, Asian countries are more export-dominant), currency depreciation usually has a positive effect on the domestic stock market in these countries (Ma and Kao, 1990). Hence, stock prices and exchange rates should be positively correlated in Asian markets based on the international trading effect.

As opposed to the view of Aggarwal (1981) and Bahmani-Oskooee and Sohrabian (1992) used a portfolio balance approach to analyze the influence of stock prices on exchange rates. If the impact of an external parameter influences the stock market to go up, the domestic investors' wealth increases, raising the demand for the currency according to the investment portfolio equilibrium theory. The demand for money then increases and drives the interest rate to rise, consequently absorbing the inflow of foreign capital and causing the domestic currency to appreciate. Thus, if investors are more optimistic regarding the stock market of a country, foreign capital investors may then increase their investment to this country's stock market because of the speculative demand, and indirectly cause the appreciation of this country's currency. Stock markets and foreign exchange markets in Asian have become increasingly attractive to foreign capital in recent decades, causing the possibility of portfolio balance effect mentioned by Bahmani-Oskooee and Sohrabian (1992) to also exist in Asian markets. However, contrary to the international trading effect, the portfolio balance effect states that stock prices and exchange rates should be negatively correlated.

Although the international trading effect (Aggarwal, 1981) and the portfolio balance effect (Bahmani-Oskooee and Sohrabian, 1992) on the stock and foreign exchange markets could both exist in Asian countries, the directions of these two effects are different. As such, I endeavored to determine the "net" effect left in the relationship if I use data in Asian markets, as such situation may depend on market conditions. This paper proposes that the portfolio balance effect should not always exist. If the stock market of a country is not volatile, then foreign capital will not be absorbed in this market, and the indirect influence on exchange rate may be restrained. Only when the profit opportunity is obvious, then considerable quantities of foreign capital may enter or leave the stock market, creating obvious influence on exchange rate. Therefore, the goal of this paper is to observe the various relationships between the stock and foreign exchange markets in Asia, and to test whether or not the relationships can change depending on market conditions. The quantile regression model is used to estimate the relation of these two markets under different market conditions (different quantiles of exchange rates).

With increasing international diversification taking place in recent years, cross-market return correlations, gradual abolishment of capital inflow barriers and foreign exchange restrictions, and the adoption of more flexible exchange rate arrangements in emerging and transition countries, stock and foreign exchange markets have become interdependent (Aydemir and Demirhan, 2009). However, previous related studies have shown highly differing empirical evidences of this interdependence. This paper provides a new explanation for the various relationships between these two markets.

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