

The pricing of foreign exchange risk around the Asian financial crisis: evidence from Taiwan's stock market

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Abstract

The volatile exchange rate movement during the Asian financial crisis has led global investors to re-evaluate the importance of currency exposures in Asian stock markets. In this paper, we examine industry-level currency risk of Taiwan's stock market around the Asian financial crisis. The results show that most export-oriented industries, except for the electronics industry, are positively affected by the depreciation of the New Taiwan Dollars (NTD) against the US Dollars (USD). We also find that the magnitude of currency risk is less for banking and electronics industries in the Taiwan Stock Exchange (TSE) than for those in the over-the-counter (OTC) security exchange. Our results are consistent with the findings of Chow et al. (*J. Financial Res.* 2 (1997b) 191) and have important implications for international investors with exposures in Taiwan's stock market. © 2002 Elsevier Science B.V. All rights reserved.

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1. Introduction

The purpose of this paper is to examine industry-level exchange rate risk in Taiwan's stock market around the Asian financial crisis. Prior researches on the

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exchange rate exposure of asset returns focus mainly on the U.S. and Japanese markets (Ceglowski, 1989; Jorion, 1990, 1991; Bodnar and Gentry, 1993; Chow et al., 1997a,b; Choi et al., 1998). The volatile exchange rate movement during the Asian financial crisis has led global investors to re-evaluate the importance of currency exposures in Asian stock markets.

At the firm level, Jorion (1990) finds that the exposure of U.S. multinationals is positively related to the percentage of foreign sales. Chow et al. (1997b) point out that the exchange rate exposure of U.S. multinationals is significant related to firm size but not to the relative portion of foreign sales to total sales. They conclude that hedging activities exhibit economies of scales, so the magnitude of exchange rate exposure is less for larger firms than for smaller firms. Choi et al. (1998) show that the pricing of exchange rate risk in the Japanese market varies when different exchange rate measures are used. The exchange rate risk is priced in both weak and strong yen periods using the bilateral yen/USD rates, but the result is mixed using the trade-weighted exchange rates.

At the industry-level, Ceglowski (1989) finds that the depreciation of the USD increases the sales of oil extraction, industrial machinery, instruments, transportation and hotel industries, but the construction and durable goods industries are adversely affected during the sample period. Bodnar and Gentry (1993) find that the percentages of industries having significant exchange rate exposure in Canada, USA and Japan are 21, 28 and 35%, respectively during 1979–1988. The variances of the estimated exchange exposure coefficients across industries are larger for Canada and Japan than for USA. They conclude that this result is consistent with the open-economy hypothesis, which indicates that the smaller and more open the economy is, the larger are the inter-industry differences in exchange rate exposure.

The currency exposures of emerging stock markets in Asia have been the subject of recent interest on the part of academics and investors alike. This interest is attributable in part to the volatile currency movement during the Asian financial crisis, which has led global investors to realize that ignoring the currency risk can have substantial effects on their portfolio performances. International investors in Taiwan still suffer from few means to hedge local currency risk. The New Taiwan Dollar futures market does not exist, and the scope of the forward exchange market is limited in terms of annual turnover. The lack of currency hedging instruments is a unique feature of Taiwan's foreign exchange market compared with that in East Asian countries. This may affect how foreign exchange risk is priced. Besides, the economy in Taiwan is typically controlled by small to median size firms with family at the core of the business. These firms may not be constantly on the alert for local currency risk because the Central Bank of China has a long track record of keeping the exchange rate stable. Therefore, they are particularly vulnerable to volatile NTD rates around the Asian financial crisis. Moreover, Taiwan's stock market is one of the important markets both in Asia and in the world. By dollar value of transaction, the Taiwan stock market (US\$1310.2 billion) ranked third in the world behind the New York Stock Exchange (US\$5777.7 billion) and the London Stock Exchange (US\$1989.5 billion) in 1997. Taiwan is in the process of continued opening of its equity market to foreign investment. The Morgan Stanley Capital

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