



# Stock prices and exchange rate dynamics

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## Abstract

We study the long-run and short-run dynamics between stock prices and exchange rates and the channels through which exogenous shocks impact on these markets by using cointegration methodology and multivariate Granger causality tests. We apply the analysis to a group of Pacific Basin countries over the period 1980–1998. The evidence suggests that stock and foreign exchange markets are positively related and that the US stock market acts as a conduit for these links. Furthermore, these links are not found to be determined by foreign exchange restrictions. Finally, through the application of recursive estimation the evidence shows that the financial crisis had a temporary effect on the long-run comovement of these markets.

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## 1. Introduction

The recent emergence of new capital markets, the relaxation of foreign capital controls and the adoption of more flexible exchange rate regimes have increased the interest of academics and practitioners in studying the interactions between the stock and foreign exchange markets. The gradual abolition of foreign exchange controls in emerging economies has opened the

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possibility of international investment and portfolio diversification. At the same time, the adoption of more flexible exchange rate regimes by these countries in the late 1980s and early 1990s has increased the volatility of foreign exchange markets and the risk associated with such investments. The choice of currency denomination has added an important dimension to the overall portfolio decision.

Classical economic theory suggests a relationship between the stock market performance and the exchange rate behaviour. For example, “flow oriented” models of exchange rate determination (see e.g. Dornbusch and Fisher, 1980), affirm that currency movements affect international competitiveness and the balance of trade position, and consequently the real output of the country, which in turn affects current and future cash flows of companies and their stock prices. Movements in the stock market may also affect exchange rates. Equities, being part of wealth, may affect the behaviour of exchange rates through the demand for money according to the monetarist models of exchange rate determination (see Gavin, 1989). Similar links can be traced through the portfolio-balance models as well (see Branson, 1983; Frankel, 1983).

Previous studies, which have examined the relationship between stock and foreign exchange markets mainly for US (see e.g. Aggarwal, 1981; Soenen and Hennigar, 1988; Ma and Kao, 1990; Roll, 1992; Chow et al., 1997), found different results concerning the links between the two markets. For example, Aggarwal (1981) finds that revaluation of the US dollar is positively related to stock market returns. In contrast, when Soenen and Hennigar (1988) considered a different period, 1980–1986, they found a significantly negative relationship. Roll (1992), who used daily data over the period 1988–1991, found also a positive relationship between the two markets. On the other hand, Chow et al. (1997) using monthly data for the period 1977–1989 found no relationship for monthly excess stock returns and real exchange rate returns. When repeating the exercise, however, with longer than six months horizons they found a positive relationship between a strong dollar and stock returns.

At the micro level other works have focused on evaluating the exposure of domestic firms to foreign currency risk. Apart from the economic exposure, which arises from variations in firm's discounted cash flows when exchange rates fluctuate, firms also face transaction exposure due to gains or losses arising from settlement of investment transactions stated in foreign currency terms. Empirical work using an unconditional pricing multi-factor asset pricing model generally reports that the exchange risk is not priced either in the US or in the Japanese markets (see e.g. Jorion, 1991; Hamao, 1988; Brown and Otsuki, 1990). More recent studies, however, using a conditional international asset pricing model with exchange risk find that the conditional model outperforms the unconditional model used by prior work, and report that the exchange risk is priced for the four largest countries, US, UK, Japan and Germany (see e.g. Dumas and Solnik, 1995; De Santis and Gerard, 1998).

Our study concentrates on the macro level issues and contributes to the literature in the following ways. First, the paper clarifies the theoretical issues of the relationship between stock and foreign exchange markets. It discusses the channels through which exogenous shocks impact on these markets and link them together. Secondly, it considers simultaneously both the short-run and the long-run dynamics of the financial markets. Earlier empirical work focused their analysis on the linkage between the returns in the two markets and did not consider the relationship between the *levels* of the series. One of the reasons for concentrating on returns is the fact that financial time series do not satisfy the basic assumption of stationarity required to avoid spurious inferences based on regression analysis. By differencing the variables, however, some information regarding a possible linear combination between the levels of the

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