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Can the traditional Asian US dollar peg exchange rate regime be extended to include the Japanese yen?

Colm Kearney [a,1], Cal Muckley [b,*]

[a] *School of Business Studies and Institute for International Integration Studies, Trinity College Dublin, Ireland*
[b] *UCD Smurfit School of Business, University College Dublin, Ireland*

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Abstract

Using daily data for a select set of four Asian exchange rates, namely the Hong Kong dollar, the Singapore dollar, the Taiwan dollar and the Thailand baht, from October 1985 to October 2002, we apply principal components analysis and the O-GARCH model to describe the evolution and persistence in the correlations over time. We also estimate 2-, 3- and 4-variable multivariate GARCH models, without imposing the assumption of constant correlations, to investigate volatility interaction amongst the currencies. To allow for fat tails in the distributions of exchange rate changes, we use the multivariate student-*t* distribution in maximising our log-likelihood functions. Our results indicate the possibility of designing an Asian exchange rate system involving a number of the region's currencies.

JEL classification: F36; E44
Keywords: Multivariate GARCH models; Exchange rate systems; Currency pegs

1. Introduction

The Asian financial crisis 1997–98 (see AuYong, Gan, & Treepongkaruna, 2004; Pathan, Skully, and Wickramanayake, in press) raised many questions about the appropriateness of the region's exchange rate systems. Most regional monetary authorities have traditionally managed their exchange rates relative to the US dollar (see Frankel & Wei, 1994; Kearney & Muckley, 2007a,b; McKinnon, 2000; McKinnon & Schnabl, 2004). This exchange rate setting practice was motivated

* Corresponding author. Tel.: +44 191 45425.
E-mail addresses: colm.kearney@tcd.ie (C. Kearney), cal.muckley@ucd.ie (C. Muckley).
[1] Tel.: +353 1 608 2688.

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by the possibility of achieving price stability alongside the goals of regional financial market and trade integration and the desire to avoid penalising resident investors exposed to foreign exchange rate risk. As the crisis revealed, however, this was not an optimal policy (see Kwan, 2001; McKinnon & Schnabl, 2003; Mussa et al., 2000). Asian investment and trade linkages are increasingly focused beyond the US dollar area, to include Japan and European countries, and, as a result, a volatile Yen/US$ exchange rate has proven to be harmful for the economies concerned. For example, the US dollar appreciated relative to the Japanese yen by more than 40% from May 1995 through August 1998 and it is alleged that this played a central role in precipitating the Asian financial crisis.

It is worthwhile elaborating on this point, many North and Southeast Asian countries, including China and Hong Kong SAR, Indonesia, Malaysia, Singapore and Thailand, already conduct most of their trade within the region, and a significant proportion of this trade occurs with Japan and, moreover, the degree of intra regional trade integration is rising over time (see Huang & Guo, 2006; Kearney & Muckley, 2005; Shin & Wang, 2004). Furthermore, a characterising feature of the Asia region is the increasing level of foreign direct investment that originates to a significant extent in Japan or the European economies (see Fukao, Ishido, & Ito, 2003; Gao, 2005). Moreover, Choudhry, Lin, and Peng (2007) document the growing importance of Japan with respect to long-run relations between the regions' stock markets since the Asian financial crisis. Taken together, these emerging features help to explain why the soft dollar peg maintained by many of the North and Southeast Asian countries rendered these countries increasingly uncompetitive and their exchange rate policies increasingly untenable during the late 1990s. Indeed, these emerging trade and investment linkages imply that a future scenario of a strongly appreciating or depreciating US dollar will have an even more profound influence on the region's economies unless better exchange rate arrangements are implemented.

In recognition of this, there is an emerging debate about the need for more cooperative arrangements amongst the region's monetary authorities. Most advocated exchange rate arrangements involve variations on extending the received US dollar pegging regime to a (different) currency specific or a common basket peg arrangement or to an exchange rate system of mutual pegging such as the European Monetary System's Exchange Rate Mechanism. A significant recent development, in this regard, is the extension of the Chiang Mai Initiative in May 2005 from bilateral currency swaps alone to a type of 'multilateralization'. The extended Initiative provides a pool of reserves valued at 40 Billion US dollars which central banks may draw upon if their currencies come under speculative attack. Researchers at key organisations, such as the Institute for International Monetary Affairs and the Asian Development Bank, have advocated the development of this framework to eventually facilitate the coherence of regional foreign exchange rate and related monetary policies (see Madhur, 2002; Shinohara, 2006). Moreover, there exists an impressive array of Asian institutions with related responsibilities, including the ASEAN (+3) (Association of Southeast Asian Nations plus China, Japan and South Korea), the APEC (Asia Pacific Economic Cooperation), the EMEAP (Executives' Meeting of East Asia-Pacific Central Banks) and the six Markets group. These institutions, with the passing of time, are incessantly extending their remits with respect to supporting and developing regional financial and monetary arrangements.

To date, evidence pertaining to informing a more coherent and robust exchange rate arrangement has focused almost exclusively on the determination of the conditional mean of North and Southeast Asian exchange rate returns. Seminal contributions include Bowman (2005), Frankel and Wei (1994), Hernandez and Montiel (2003) and McKinnon (2000). Overall, these articles suggest that while the US dollar continues to be the most influential regional currency, the Japanese yen and the euro exert rising effects on several currencies, especially since the Asian financial crisis. These findings point to the promising possibility of introducing a more co-ordinated basket peg type