



The exchange rate regime in Asia: From crisis to crisis

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ABSTRACT

Prior to the Asian financial crisis, most Asian exchange rates were *de facto* pegged to the US Dollar. During the crisis, many economies experienced a brief period of extreme flexibility. A 'fear of floating' gave reduced flexibility when the crisis subsided, but flexibility after the crisis was greater than that seen prior to the crisis. Contrary to the idea of a durable Bretton Woods II arrangement, Asia then went on to slowly raise flexibility and reduce the role for the US dollar. When the period from April 2008 to December 2009 is compared against periods of high inflexibility, from January 1991 to November 1991 and October 1995 to March 1997, the increase in flexibility is economically and statistically significant. This paper proposes a new measure of dollar pegging, the "Bretton Woods II Score". We find that Asia has been slowly moving away from a Bretton Woods II arrangement.

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1. The exchange rate regime in Asia

Questions connected with the exchange rate regime have been an important part of understanding macroeconomic policies and outcomes in Asia. In the period leading up to the Asian crisis of 1997, many Asian economies had highly inflexible exchange rates. In the aftermath of the Asian crisis, while many economies announced reforms of the exchange rate regime, Calvo and Reinhart (2002) pointed out that there was a substantial difference between the *de jure* and *de facto* exchange rate regime, and that many economies had gone back to a high degree of exchange rate inflexibility after the crisis.

A substantial research effort tried to understand the sources of this 'fear of floating'. Some hypotheses that have been offered include, the desire to reduce the currency risk faced by corporations with currency mismatches and incomplete financial markets, and the desire to stabilise domestic inflation in a small open economy with substantial exchange rate pass-through.¹ Dooley, Folkerts-Landau, and Garber (2003) have hypothesised the emergence of an Asian-led 'Bretton Woods II' regime motivated by exchange rate mercantilism. Some economists have argued that central bank actions aimed at exchange rate undervaluation should be an integral part of the optimal growth strategy in developing economies (Rodrik, 2008). Other researchers have argued that there is little evidence about a causal impact of exchange rate undervaluation on growth in the long run (Woodford, 2009).

The macroeconomic policy framework in some Asian countries has involved a certain interlocking set of features: exchange rate inflexibility, large current account surpluses, and the accumulation of large foreign exchange reserves. This has led to concerns about global imbalances. The resolution of these imbalances may be critically linked to modifying the exchange rate regime in some Asian economies (Lane & Milesi-Ferretti, 2004).

In parallel, there has been interest in questions about the role of the US Dollar (USD) in Asian exchange rate arrangements as opposed to the Euro (EUR), the Yen (JPY) and the British Pound (GBP). To the extent that Asian economies have moved away from the USD, how important have these other major international currencies become?

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¹ These hypotheses have been documented in Eichengreen, and Hausman (1999); Hausmann et al. (1999); Patnaik, and Shah (2010).

In this setting, the following four questions are of interest:

1. In the period immediately after the Asian crisis, did Asian economies go back to pre-crisis levels of exchange rate flexibility?
2. Did Asian economies then evolve into a durable 'Bretton Woods II' arrangement, featuring exchange rate inflexibility and pegging to the USD?
3. To what extent have Asian exchange rate regimes shifted focus from the USD to the EUR, the JPY and the GBP?
4. To what extent did exchange rate regimes encounter an abrupt change in the global financial crisis of 2008, when compared with the experience of 1997?

In this paper, we offer new evidence on these questions. The role of the dollar as a predominant international currency to which Asian countries peg is explicitly explored. We propose a 'Bretton Woods II Score'. Prior to the Asian crisis, the average BW-II Score was high. The score dropped sharply during the crisis and rose again after it. However, after 2006 the score declined. This suggests that Asia has slowly moved away from the tight dollar pegging.

The remainder of this paper is organised as follows. Section 2 explains the methodology used to measure the fine structure of exchange rate regimes in Asia, and obtain dates of structural change of the exchange rate regime. Section 3 analyses the results obtained by measurement and dating of the *de facto* currency regime in each economy in order to address the four questions enumerated above. Detailed results for each of the 11 economies have been placed in an appendix, and Section 4 concludes.

2. Methodology

The importance of measuring the *de facto* exchange rate regime has motivated research on data-driven methods for the classification of exchange rate regimes. This literature has attempted to create datasets identifying the exchange rate regime in operation for all economies in recent decades, using a variety of alternative heuristic procedures (Levy-Yeyati & Sturzenegger, 2005; Reinhart & Rogoff, 2004; Calvo & Reinhart, 2002).

For instance, Reinhart and Rogoff (2004) use a variety of descriptive statistics to classify the exchange rate regime. They classify the exchange rate regime as a crawling peg when the probability, that the monthly nominal exchange rate (typically to the USD) is within $\pm 1\%$ over a rolling five year period, is above 80%. Reinhart and Rogoff (2004) also create a classification with seven types of exchange rate regimes.² In a similar fashion, Levy-Yeyati and Sturzenegger (2005) classify countries into three regimes – float, intermediate and fixed – by examining the volatility of exchange rates.

In terms of the range of dates covered, Calvo and Reinhart (2002); Reinhart and Rogoff (2004); Levy-Yeyati and Sturzenegger (2005) analyse exchange rate regimes till 2002, 2003 and 2004 respectively.³ In order to examine more recent events, the IMF *de facto* classification of exchange rate regimes and monetary policy frameworks is useful in that it is regularly updated. While it is available from 1998 onwards, the adoption of a revised system for classification (Habermeier, Kokenyne, Veyrune, & Anderson, 2009) hinders comparisons with the previous years.

The estimation strategy used in this paper Zeileis et al. (2010) builds on this literature in three respects. Exchange rate flexibility is measured as a real number from 0 (very high flexibility) to 1 (hard peg). Structural change in the exchange rate regime is addressed using a sound inferential strategy which yields estimates of break dates to the resolution of the week. Finally, the econometric computations are easily redone using current data, allowing for easy updation of the *de facto* exchange rate regime database, thus permitting the analysis of current questions.

The point of departure for this strategy is a linear regression model based on cross-currency exchange rates (with respect to a suitable numeraire). Used at least since Haldane and Hall (1991), this model was popularized by Frankel and Wei (1994) (and is hence also called the Frankel–Wei model). Recent applications of this estimation strategy include Bénassy-Quéré, Coeuré, and Mignon (2006), Shah, Zeileis, and Patnaik (2005) and Frankel and Wei (2007). An independent currency, such as the Swiss Franc (CHF), is chosen as an arbitrary 'numeraire'. If estimation involving the Indian rupee (INR) is desired, the model estimated is:

$$d\log\left(\frac{\text{INR}}{\text{CHF}}\right) = \beta_1 + \beta_2 d\log\left(\frac{\text{USD}}{\text{CHF}}\right) + \beta_3 d\log\left(\frac{\text{GBP}}{\text{CHF}}\right) + \beta_4 d\log\left(\frac{\text{JPY}}{\text{CHF}}\right) + \beta_5 d\log\left(\frac{\text{EUR}}{\text{CHF}}\right) + \varepsilon$$

This regression picks up the extent to which the INR/CHF rate fluctuates in response to fluctuations in the USD/CHF rate. If there is pegging to the USD, then fluctuations in the GBP, JPY and EUR will be irrelevant, and we will observe $\beta_3 = \beta_4 = \beta_5 = 0$ while $\beta_2 = 1$. The R^2 of this regression is also of interest; values near 1 suggest reduced exchange rate flexibility.⁴

The choice of currencies in the regression analysis reflects the core international currencies in the global financial system. The Composition of Foreign Exchange Reserves (COFER) database maintained by the IMF suggests that more than 83% of the world's reserves have always been held in USD, EUR (formerly DEM), GBP and JPY. Maintained since 1995, the COFER database has 140 economies reporting composition of reserves. Since 2000, an average of 97.8% of world reserves reported to the IMF has been held in these four currencies.

² The categories are: peg, band, crawling peg, crawling band, moving band, managed float and free float. This is similar to the International Monetary Fund's (IMF) AREAER classification. The fine classification within these coarse categories is also available on their website.

³ Ilzetski, Reinhart and Rogoff have extended the database using the method in Reinhart, and Rogoff (2004) till December 2007.

⁴ The Deutsche Mark is used as a proxy for the Euro in the older data. Hence, the term 'EUR' is used instead of 'DEM', to convey the concatenation of the time-series of DEM/CHF rates followed by the EUR/CHF rates.

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