How Credible was the Hong Kong Link in the East Asian Crisis?

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The Hong Kong dollar suffered a powerful speculative attack in late October 1997, as the East Asian financial storm swept across the region. The linked exchange rate of HK$7.80/US$ remained intact, but local interest rates jumped to unprecedented heights, and then stayed at uncomfortably high levels. The Indonesian crisis in January 1998 caused another nervous moment of interest rate hikes in the territory.

As a currency board system, the Hong Kong link was supposed to be buttressed by the double mechanisms of specie-flow and cash arbitrage. However, for reasons explained in Tsang (1996a, 1996b, 1997), the linked rate of 7.80 never exactly held. The deviation of the market exchange rate from the official rate averaged about 1% from the inception of the link on 17 October 1983 to the end of January 1998, as can be observed in Chart 1 (which uses monthly average statistics). Hence one wonders whether the link has been a "target zone" instead of a water-tight fixed exchange rate regime.

Out of curiosity, I have performed Svensson's (1991) "simplest test" of the target zone credibility on the link. The assumption is that, because of arbitrage imperfection, the market rate would deviate to a certain extent from the official rate of 7.80. Nevertheless, the system still holds as few would doubt its continuation. Svensson's test first computes the rate of return of a foreign currency investment for τ months, R_t^τ, given a band within which the central bank defends the exchange rate. Hence there are an upper bound ($\overline{R}_t^\tau$) and a lower bound ($\underline{R}_t^\tau$) of the rate of return. The upper bound is

$$\overline{R}_t^\tau = (1 + i_t^{*\tau})(\overline{S}/S_t)^{12/\tau} - 1$$

where $i_t^{*\tau}$ represents the foreign interest rate in time t for a τ-month loan or investment, S_t the spot exchange rate (expressed as the ratio of the domestic currency per unit of foreign currency), and $\overline{S}$ the upper bound of the exchange rate (i.e., the limit of depreciation allowed). Likewise, the lower bound of the rate of return is given by

$$\underline{R}_t^\tau = (1 + i_t^{*\tau})(\underline{S}/S_t)^{12/\tau} - 1$$

Under the assumption of there being no arbitrage, a completely credible exchange rate implies that the domestic interest rate i_t must lie within the target zone of R_t^τ, i.e.

$$\underline{R}_t^{\tau} \leq i_t \leq \overline{R}_t^{\tau}$$

If the domestic interest rate moves above the upper bound, the no-arbitrage assumption implies that the exchange rate regime cannot be fully credible as market participants perceive a risk of devaluation. A 1% limit on either side of 7.80 as the range of the "target zone" for the linked rate system is used, on the basis that the Hong Kong monetary authorities seemed alarmed when the deviation from the official rate approached 1% in the past. Hence $\overline{S}$ is 7.878 and $\underline{S}$ is 7.722 for the "zone".

Another variant of Svensson's (1991) test is based on the assumption of uncovered interest parity. Let us look at the following equation

$$E_t S_{t+\tau} = S_t[(1 + i_t^{\tau})/(1 + i_t^{*\tau})]^{\tau/12}$$

where $E_t S_{t+\tau}$ is the expected value in month t of the ruling exchange rate in month $t + \tau$. The right-hand side of the equation is the (annualized) interest differential (between the domestic and foreign interest rates) adjusted for the maturity period of τ months. One can check whether the expected exchange rate (determined by interest differential) ever moved outside the "target zone", i.e. $\overline{S}$ and $\underline{S}$.

I report here the findings of the two variants of Svensson's test for the period of January 1997 to January of 1998. Charts 2 and 3 show the results using *daily closing* figures. The three-month interbank offer rate in Hong Kong (HIBOR) is used as i_t^3 and the three-month Eurodollar interest rate (LIBOR) is employed as a proxy for $i_t^{*\tau}$.

The results indicate that the Hong Kong link was not credible during the East Asian currency crisis, given a 1% "target zone". Credibility was severely shaken in October 1997, and less so in January 1998. Of course, a caveat is that a 1% "zone" was never official. Moreover, target zoning is not the same as currency board economics.

Chart 1 Monthly average movement of the HK$/US$ market exchange rate

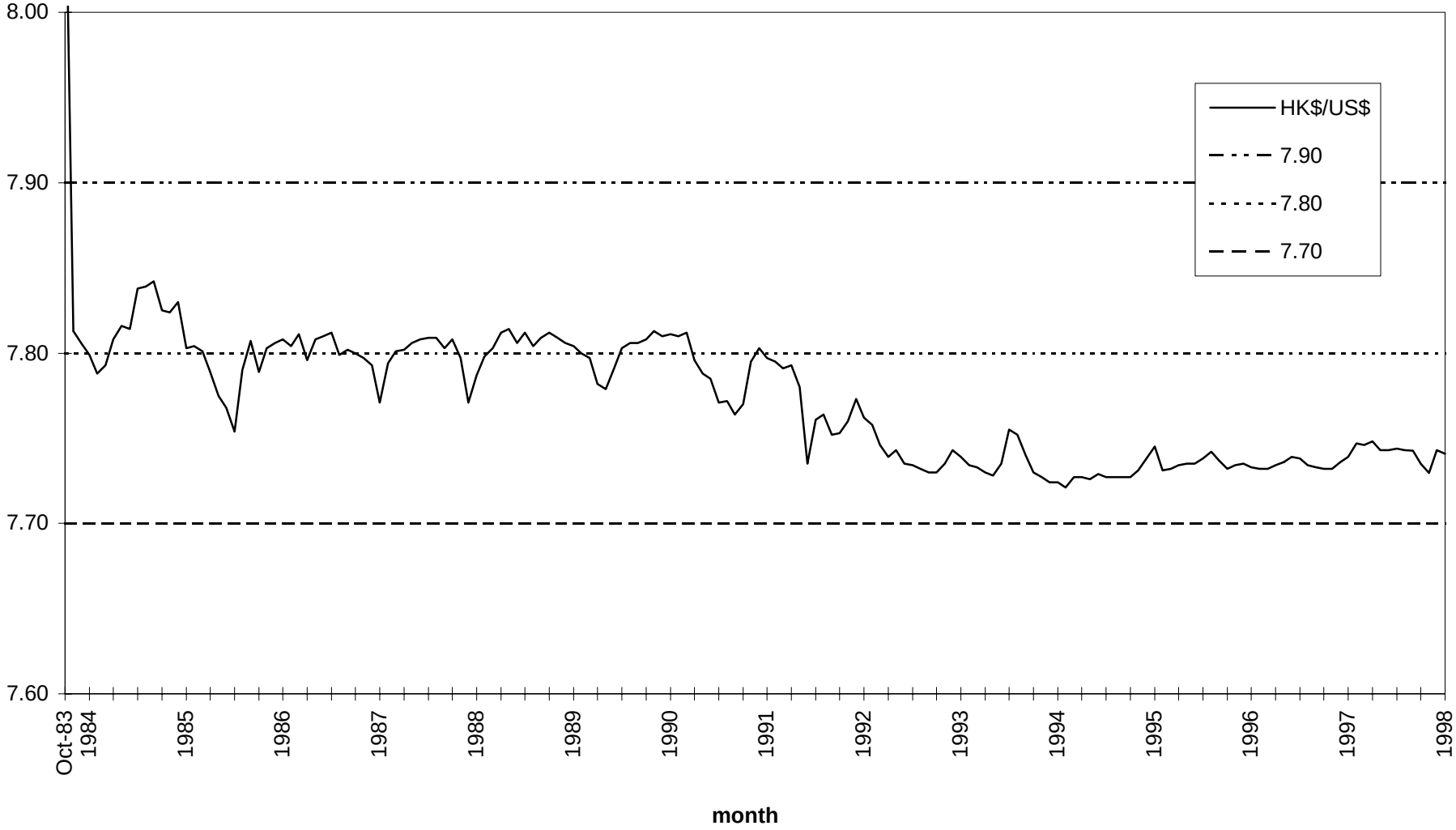


Chart 2 Svensson's "simplest test" on the link using daily data (no arbitrage)

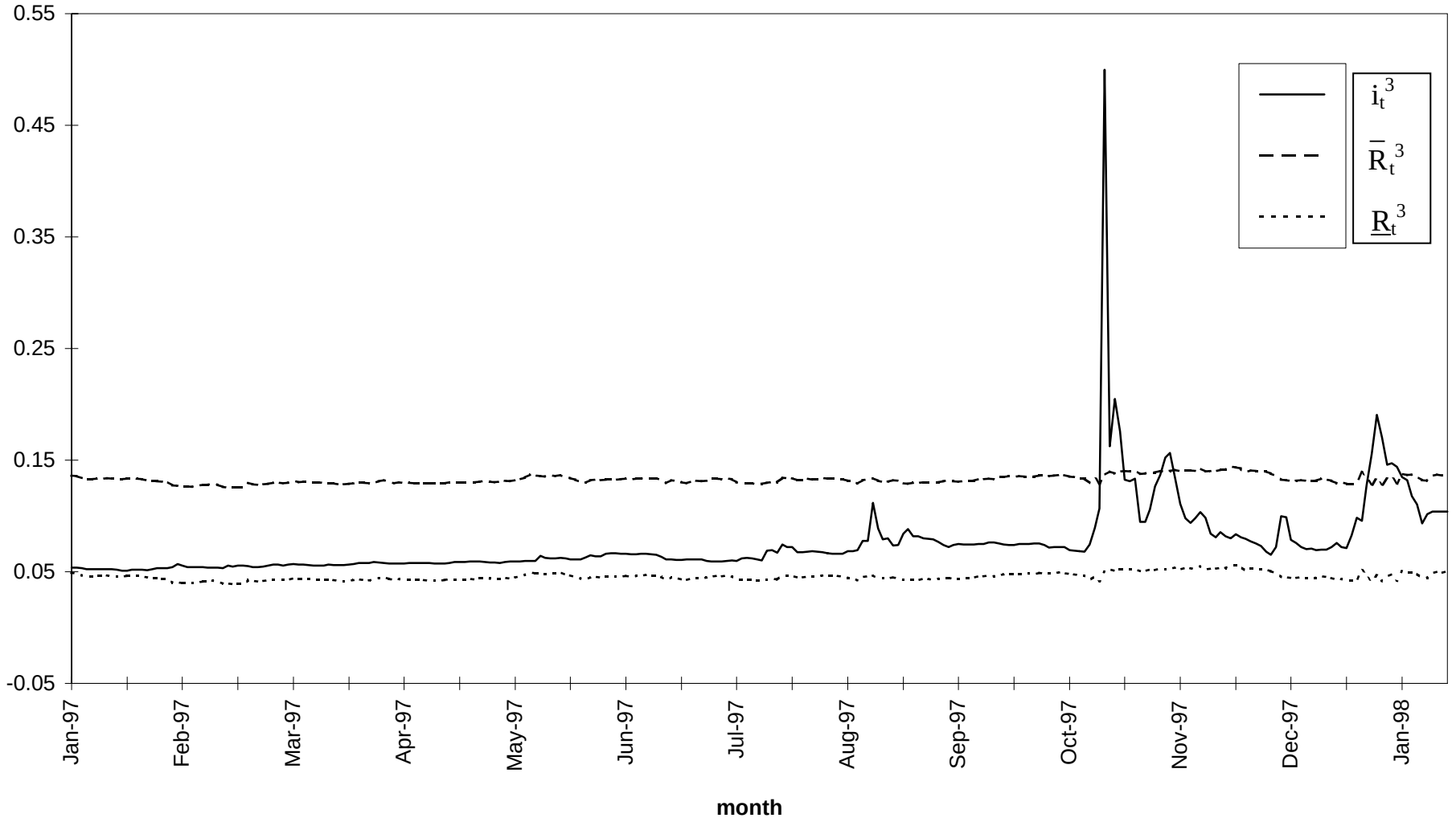
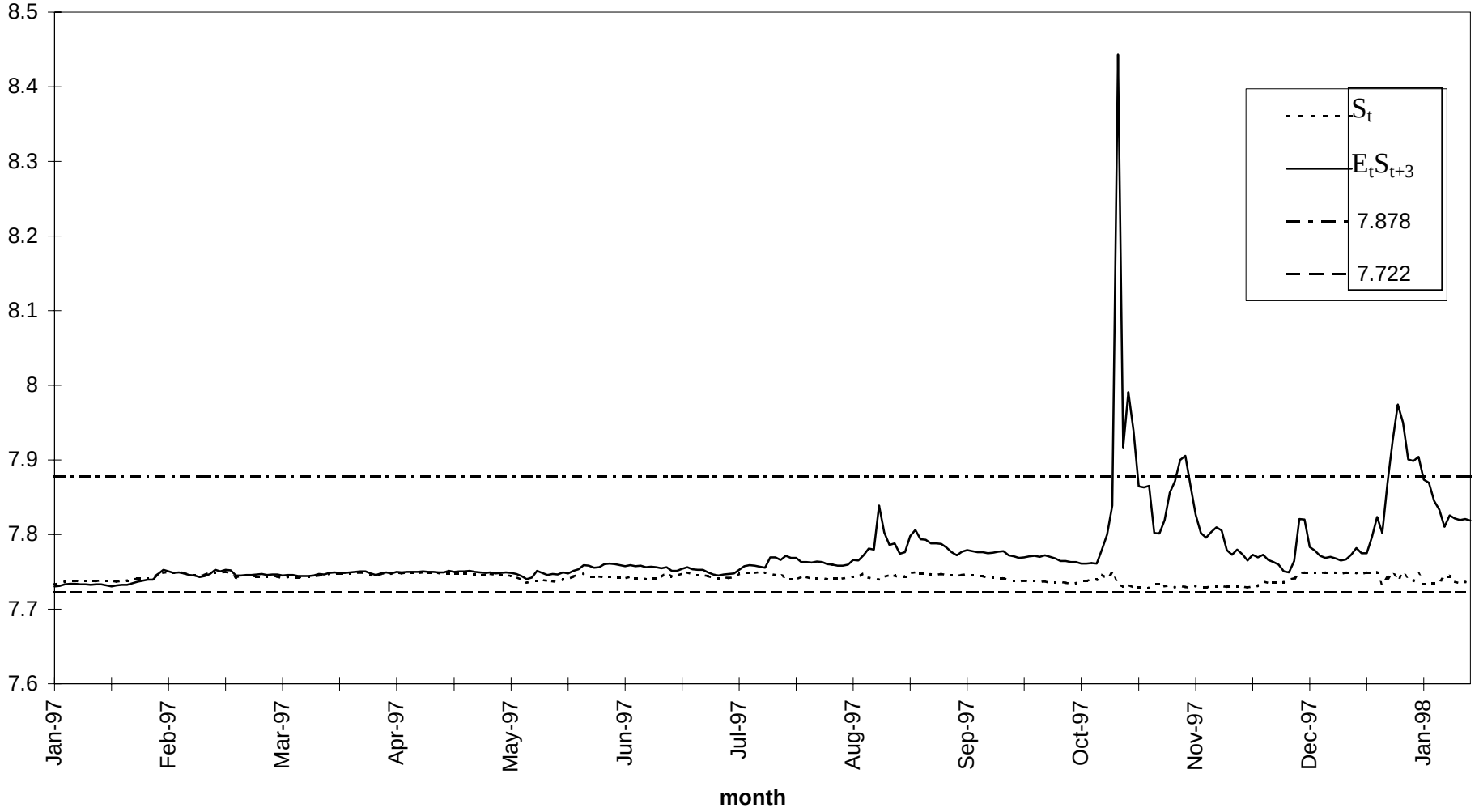


Chart 3 Svensson's "simplest test" on the link using daily data (uncovered interest parity)



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