

Reading Krugman and realising my AEL model was superior

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Krugman's (1991) target zone article on the Quarterly Journal of Economics (QJE) is a standard reference. It produces the S-curve between the two bands of the zone (see his Figure II depicting the exchange rate s and velocity shock v).

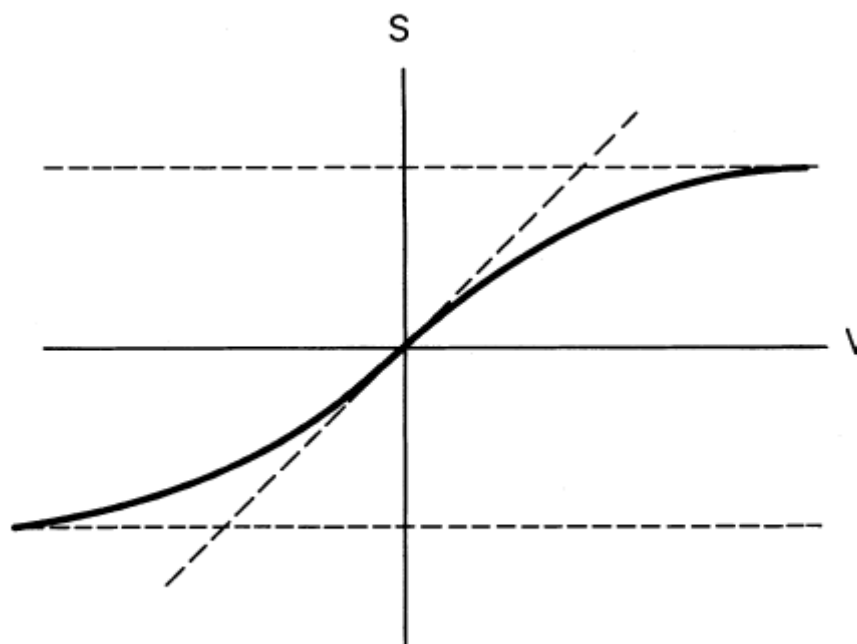


FIGURE II

Hong Kong's current linked exchange rate system, with a width of 1000 pips between 7.75 and 7.85 since May 2005, in a way resembles a narrow target zone. The important difference is that the strong and weak sides are buttressed by explicit convertibility undertakings (CUs), which will be automatically triggered. In Krugman's original formulation, even the genuine commitment of the central bank to defend the zone is subject to speculative tests.

What interests me more is that Krugman (1991) describes the defense by the central bank on both sides as similar to "smooth pasting" in the theories of option pricing and irreversible investment. Given the basic equation: $s = m + v + \gamma E[ds]/dt$ (where m is the money supply while the last term represents the expected rate of depreciation), an alternative version emerges:

$$s_t = \left(\frac{1}{\gamma}\right) \int_t^{\infty} (m + v) e^{-(1/\gamma)(\tau-t)} d\tau.$$

Differentiating it with respect to time (t) yields the basic equation. In general, the deviation of the S-curve from the 45-degree line (in Figure II) is a result of the combined price of the two (put and call) options.

Well, that throws me back to 1997-1998, when academics, analysts and policy makers in Hong Kong argued about how to defend the link. My proposal was the AEL model, with an explicit CU for 7.80. Others suggested options and dollarization, etc.

It dawns on me that my recommendation was **superior** even from exchange rate targeting and financial option perspectives. Hong Kong's system is not exactly a Krugman zone. As a currency board, the CUs are pre-announced and on auto-pilot.

The implication, though, becomes surprisingly simple. Call and put options are **embedded in every Hong Kong dollar of the monetary base under the CUs**. Hence, there is no need to issue any specific options for whatever groups. The monetary authority can avoid the headache arising from the problems of size and pricing. Ha!

Sometimes it pays to read the classic, carefully.