Maurice Obstfeld, Jay C. Shambaugh and Alan M. Taylor

The Trilemma in History: Tradeoffs among Exchange Rates, Monetary Policies, and Capital Mobility

Discussion by Lars E.O. Svensson
www.princeton.edu/~svensson

Trilemma

- Fixed exchange rate
- Free capital mobility
- Monetary "autonomy"

Method

- Gold Standard, Bretton Woods, post Bretton Woods
- Short interest rates, peg/float (*de jure*, *de facto*), capital/controls
- Regression 1

$$\Delta R_{it} = \alpha + \beta \Delta R_{bit} + u_{it}$$

  Interpretation:

  – High β, high R^2 = Low autonomy

- Regression 2 (Pesaran-Shin-Smith, 2001:

$$\Delta R_{it} = \alpha + \beta \Delta R_{bit} + \theta(c + R_{i,t-1} - \gamma R_{bi,t-1}) + \text{lags} + u_{it}$$

  Interpretation

  – High γ, high θ = Low autonomy

- Interest rates I(0) or I(1)?
  - Stationary: Between 0 and 10% 200 yrs ago, as now
  - Small sample problem: If not reject unit root, better estimates if assume I(1)

Main results

- Gold Standard
  - Peg, low autonomy, but $\beta < 1$
  - Float, high autonomy
- Bretton Woods
  - Peg, high autonomy (capital controls)
- Post Bretton Woods
  - Peg, low autonomy
  - Float, intermediate autonomy
  - Lower R^2 than Gold Standard
- Capital controls: Higher autonomy

Comments

- Why lower R^2 in post Bretton Woods?
  - Lower and varying credibility credibility of pegs induce variation in interest-rate differentials
- "Autonomy"?
  - A "float" is an unspecified monetary-policy regime! Say "non-peg" instead of "float"
  - Correlation between R_{it} and R_{ibt} (and variability of exchange rate) depends on monetary-policy regime (objectives, loss function)!
  - Problem for "fear of floating" (Calvo-Reinhart) and classification of "exchange-rate regimes" (Reinhart-Rogoff)
- Correlation R_{it}, R_{bit} somewhat imperfect indicator of lack of "autonomy"

- Free capital mobility, exchange rate band

$$R_t - R_t^* = s_{t+1|t} - s_t + \rho_t$$

$$c_t - a \leq s_t \leq c_t + a$$

$$s_t \equiv c_t + x_t$$

$$R_t - R_t^* = (c_{t+1|t} - c_t) + (x_{t+1|t} - x_t) + \rho_t$$

$$-a \leq x_t \leq a$$

  $c_{t+1|t} - c_t$ expected rate of realignment (per period)
  $x_{t+1|t} - x_t$ expected rate of depreciation within band

  – Credible exchange rate band: $c_{t+1|t} - c_t = 0$

$$R_t - R_t^* = x_{t+1|t} - x_t + \rho_t$$

    High β

  – Imperfect credibility, variability of $c_{t+1|t} - c_t$, lower β

  – Compare ERM, Rose-Svensson drift-adjustment method, Svensson (*EER* 1993) on ERM

- Imperfect credibility of peg reduces correlation R_t, R_t^*, lowers β

Fig. 1a. BF/DM log exchange rate.

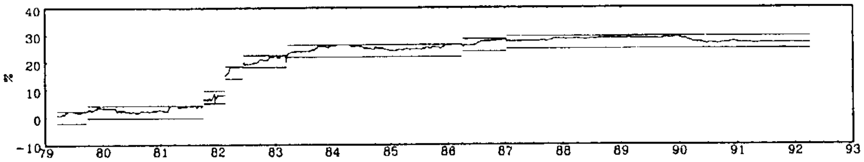


Fig. 1b. DK/DM log exchange rate.

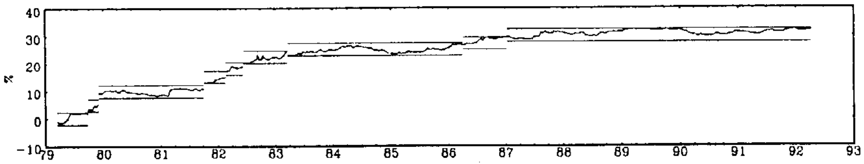


Fig. 1c. FF/DM log exchange rate.

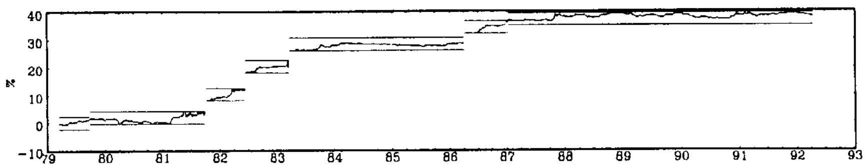


Fig. 1d. IL/DM log exchange rate.

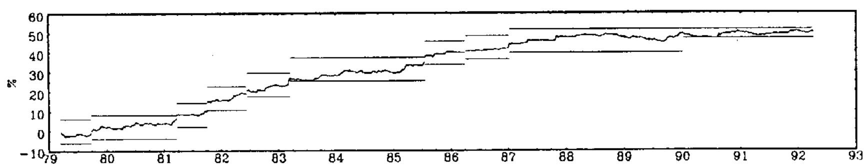


Fig. 1e. IP/DM log exchange rate.

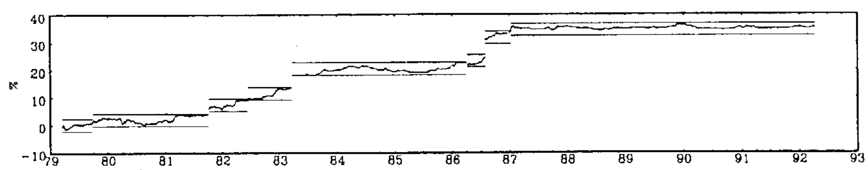


Fig. 1f. NG/DM log exchange rate.

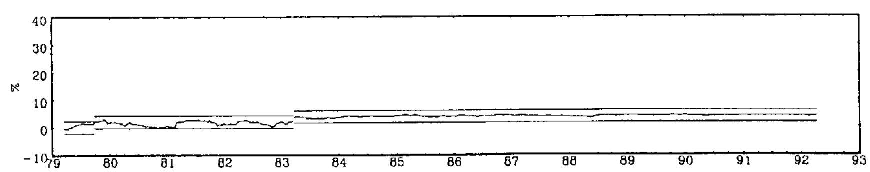


Fig. 1

Fig. 2a. BF/DM interest rate differential: 3 months.

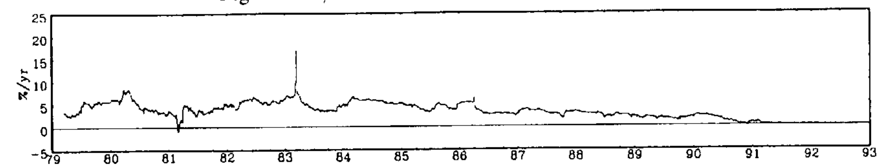


Fig. 2b. DK/DM interest rare differential: 3 months.

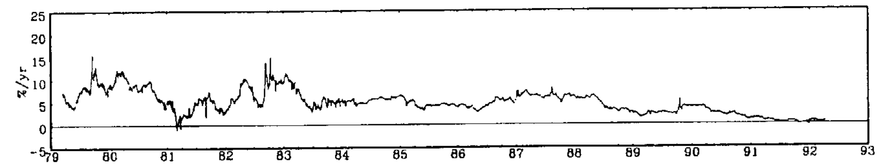


Fig. 2c. FF/DM interest rate differential: 3 months.

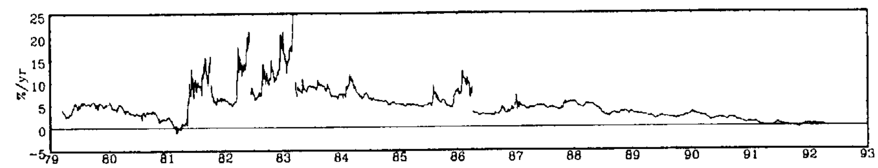
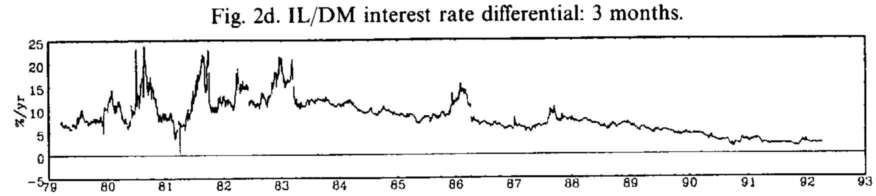


Fig. 2d. IL/DM interest rate differential: 3 months.



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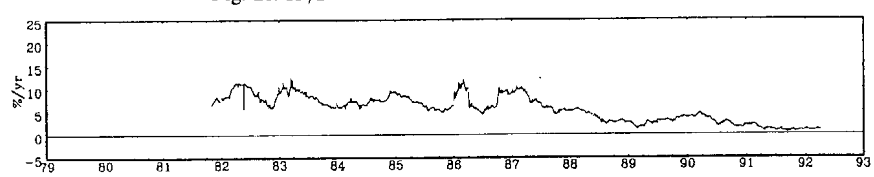


Fig. 2f. NG/DM interest rate differential: 3 months.

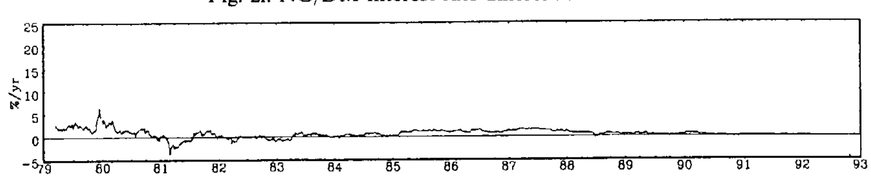


Fig. 2

Fig. 4a. BF/DM expected rate of depreciation within band (95% conf.i.): 3 months.

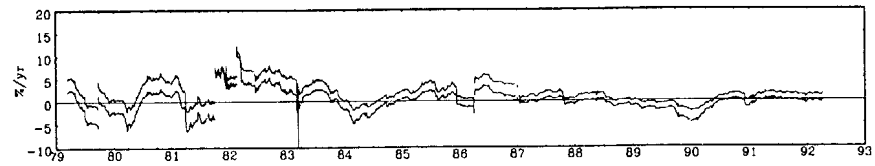


Fig. 4b. DK/DM expected rate of depreciation within band (95% conf.i.): 3 months.

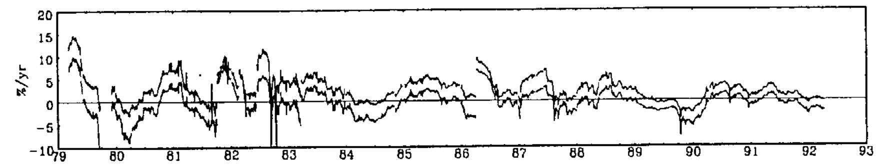
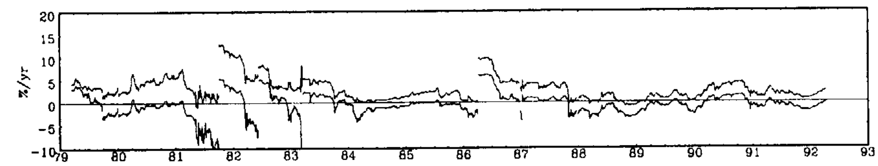


Fig. 4c. FF/DM expected rate of depreciation within band (95% conf.i.): 3 months.



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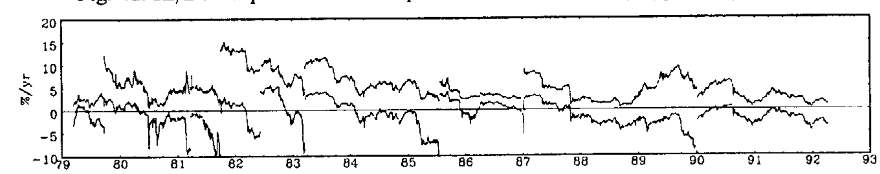

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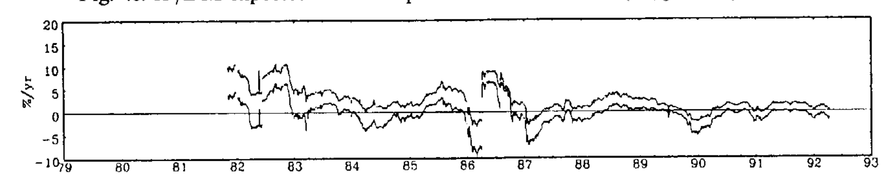

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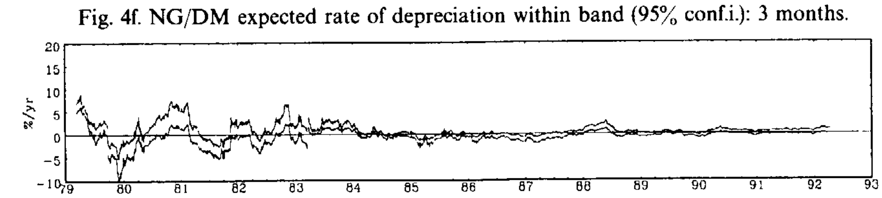


Fig. 4

Fig. 8a. BF/DM expected rate of devaluation (95% conf.i.): 3 months.

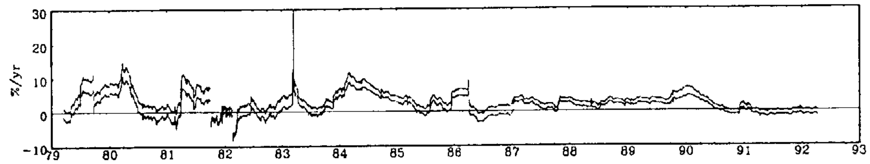


Fig. 8b. DK/DM expected rate of devaluation (95% conf.i.): 3 months.

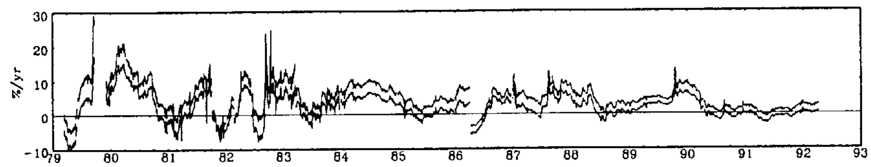


Fig. 8c. FF/DM expected rate of devaluation (95% conf.i.): 3 months.

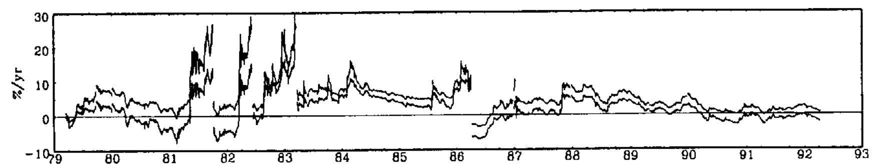
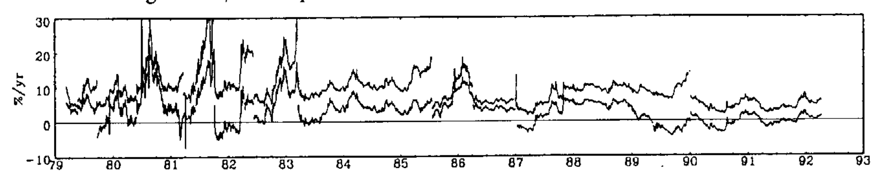


Fig. 8d. IL/DM expected rate of devaluation (95% conf.i.): 3 months.



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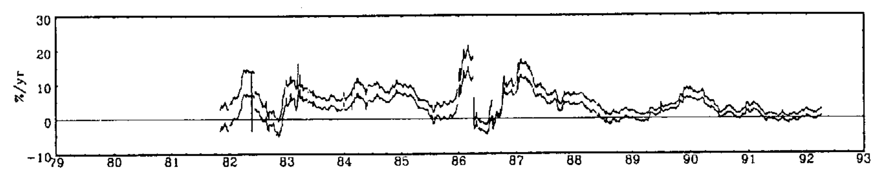

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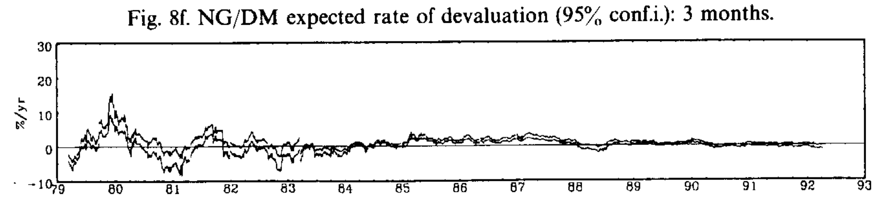

Fig. 8

- “Autonomy”
  - Narrow exchange rate band well specified (under free capital mobility)
  - “Float” not well specified (say “nonpeg”)! Monetary-policy regime? Objectives?
    * “Float”: Exchange rate not target variable (not in loss function)
    * Exchange rate still matters, if exchange rate affects (directly or indirectly) the target variables (like CPI inflation, output gap)
    * “Fear of floating”? Low exchange-rate variability does *not* imply exchange-rate objective!

– Compare open-economy flexible CPI targeting (Svensson *JIE* 2000)

  * Implied reaction function for instrument rate

$$R_t = ... + f_R R_t^* + ...$$

  * Implied reaction function depends on monetary-policy regime (loss function)
  * Strong response to R_t^* (i_t^* in table below) in some regimes (strict and flexible CPI inflation targeting), but still “autonomy”

- Correlation R_t, R_t^* somewhat problematic mesure of lack of autonomy

Table 2
Reaction-function coefficients

Case	π_t	y_t	$\pi_{t+1\|t}$	π^*_t	y^*_t	i^*_t	φ_t	y^n_t	q_{t-1}	i_{t-1}	q_t
1. Strict domestic	0.00	0.27	2.43	0.14	0.11	0.00	0.20	0.02	0.00	0.62	–
2. Flexible domestic	0.00	1.39	1.42	0.17	0.14	0.00	0.24	0.07	0.00	0.53	–
3. Strict CPI	0.02	−0.01	−2.28	−0.79	0.01	1.00	1.01	0.01	−0.01	0.00	–
4. Flexible CPI	0.72	−0.26	−0.69	−0.47	0.15	0.97	1.41	0.28	−0.22	0.01	–
5. Taylor, domestic	1.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	–
6. Taylor, CPI	1.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	−0.45	0.00	0.45