India’s policy stance on reserves and the currency

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Outline

1. Conceptual backdrop
2. Methodology and Indian evidence
3. Conclusion

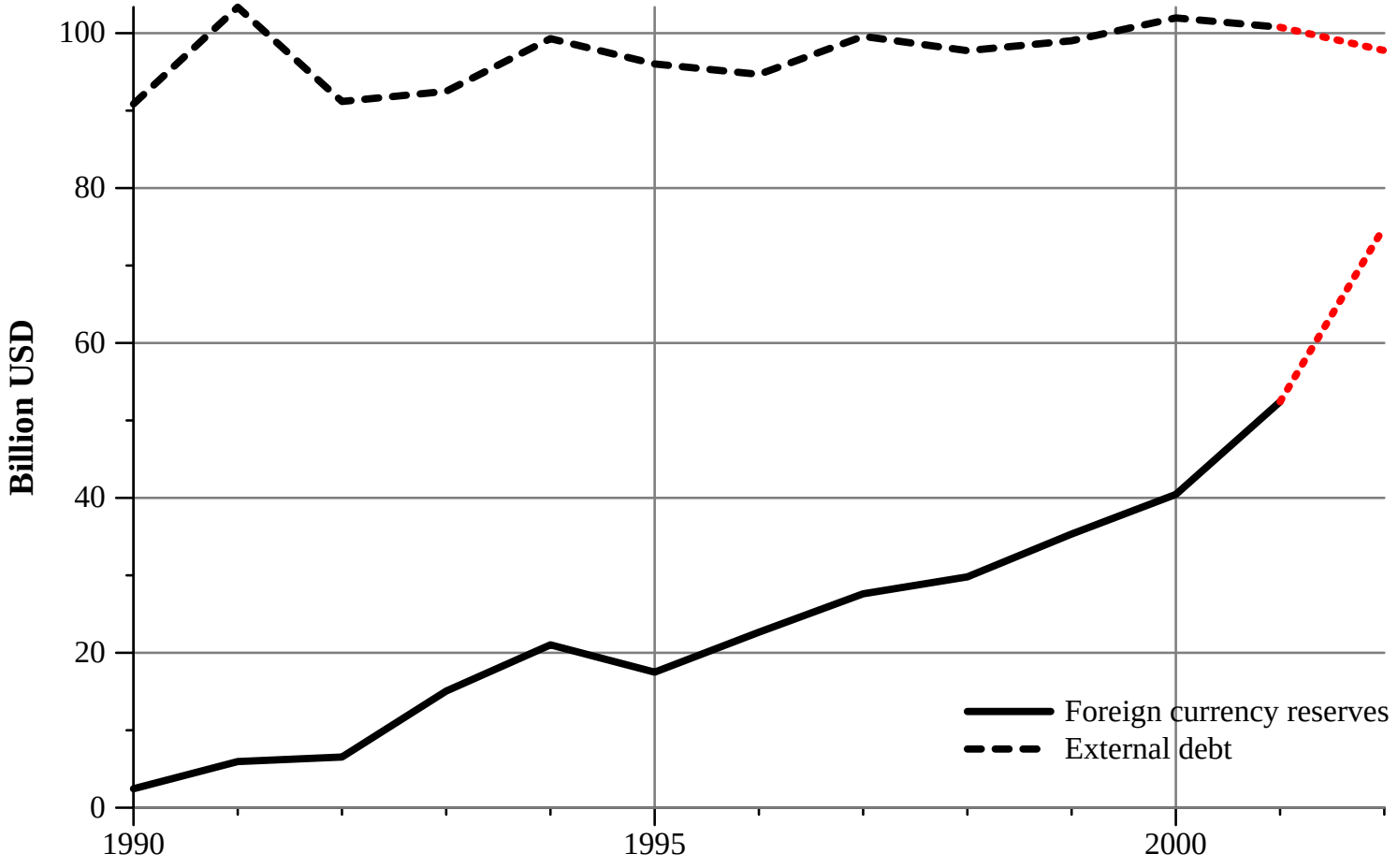
Conceptual backdrop

Rising reserves

Reserves grew rapidly in many Asian countries after the crisis. Competing explanations:

1. Reserves as “insurance”: the price of harnessing the efficiency gains of an open trade account and an open capital account.
2. Buying USD as a tool for affecting the exchange rate.

In India: piling up reserves



Measures of reserves adequacy

Trade based measures Import cover.

Liquidity based rules Example – "Guidotti rule": Reserves enough for one year's capital account liabilities?

Money based measures Most extreme – "Can the central bank buy all the currency in the system?"

Debt-based indicators Ratio of volatile foreign capital to reserves.

Measures of reserves adequacy

Trade based measures Import cover. 11.3 months at end-March 2002.

Liquidity based rules Example – "Guidotti rule": Reserves enough for one year's capital account liabilities? Satisfied by 2002.

Money based measures Most extreme – "Can the central bank buy all the currency in the system?" Satisfied by 2001-02.

Debt-based indicators Ratio of volatile foreign capital to reserves. Dropped below 50% by March 2002.

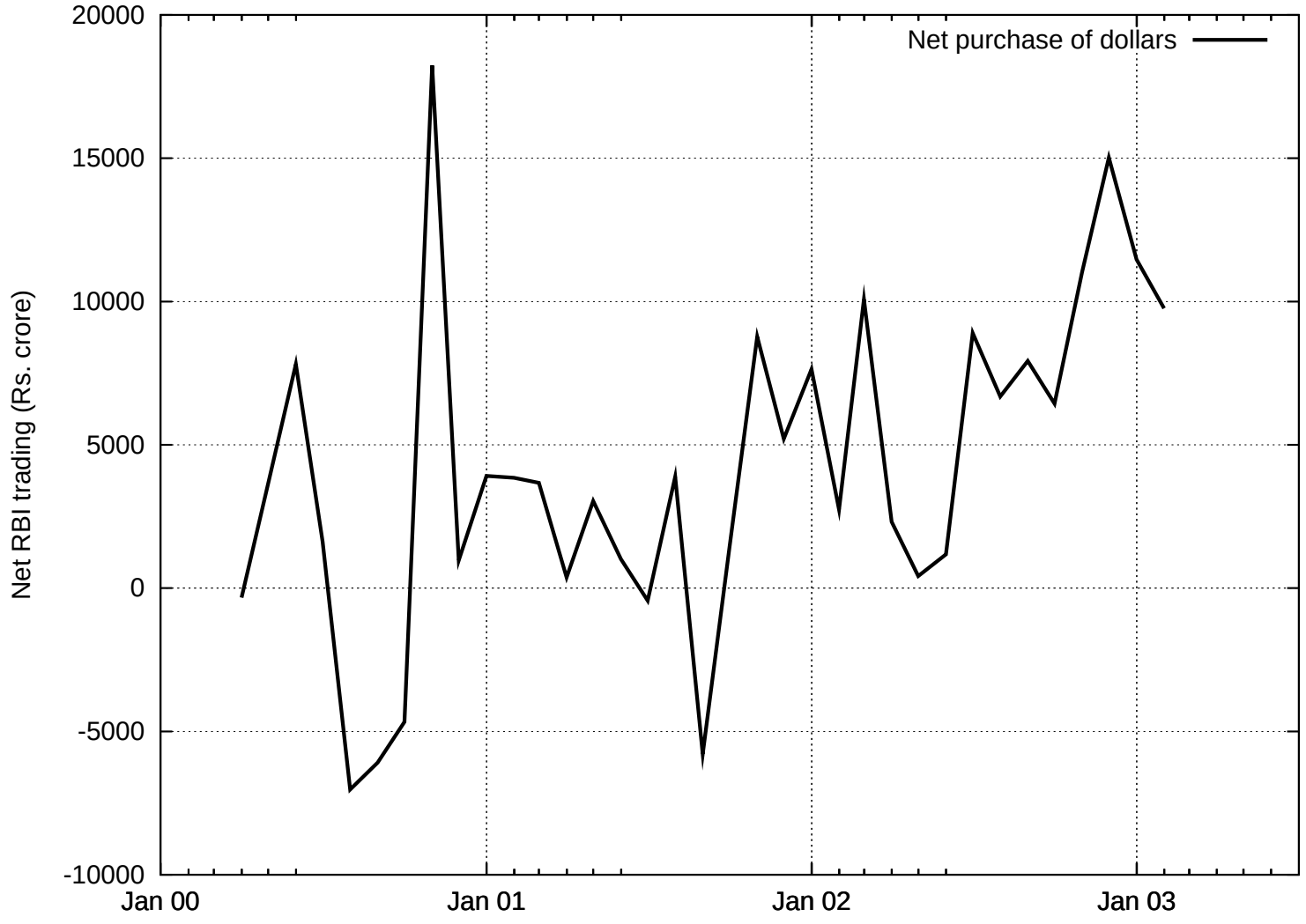
Reserve adequacy in India

	31/3/2001	31/3/2002	31/3/2003
Months of import cover	8.0	11.3	14.0
Short term debt/Reserves (%)	8.6	5.1	4.4*
NFA / Currency in circulation (%)	90.4	105.2	125.6
NFA / Reserve Money (%)	65.0	78.0	98.0
Non-debt liabilities + Short term debt / Reserves (%)	100.8	88.4	78.5#

* Pertains to December 2002.

\# Pertains to September 2002.

Purchase of dollars continues



Classifying a currency regime

Understanding a currency regime

- Official position
- Intervention data
- Statistical characteristics of exchange rate

Official Position

- In the post Bretton Woods period, 53 per cent of "managed floats" were *defacto pegs* or crawling pegs.
- The simplest and most transparent case is one in which the central bank operates on rules rather than discretion, and publicly releases documents which define the currency regime. Examples: ERM, New Zealand, Colombia.

Interventions data

Problems of quality of disclosure.

- Frequency: Developing countries are often unwilling to provide data on official intervention on a daily basis. Interventions data in India is only released at a monthly frequency.
- Access for the central bank to other instruments of intervention on the currency market.
  Sometimes SBI engages in currency trading at the behest of RBI.

Focus on outcomes

Statistical implications that intervention would have for observables, i.e. the statistical characteristics of exchange rates themselves.

Reinhart and Rogoff classification

- Monthly absolute percent changes: If the absolute monthly percent change in the exchange rate is equal to zero for four consecutive months or more, that episode is classified (for however long its lasts) as a *de facto* peg.
- Probability of the monthly exchange rate change remaining within a one percent band over a rolling 5-year period: If this probability is 80 percent or higher, then the regime is classified as a *de facto* peg or crawling peg over the entire 5-year period.

De facto peg

- A currency regime is classified as a *de facto* peg to a given currency when the volatility of the exchange rate against this currency is low, owing to policy efforts by the central bank.
- If the exchange rate has no drift, it is classified as a *fixed parity*; if a positive drift is present, it is labeled a *crawling peg*; and, if the exchange rate also goes through periods of both appreciation and depreciation it is a *moving peg*.

Currency regime in India

Liberalization

- Current account liberalization
- Capital account liberalization
- Changes in the currency regime?

RBI’s official position

The objective of the exchange rate management has been to ensure that the external value of the Rupee is realistic and credible as evidenced by a *sustainable current account deficit* and manageable foreign exchange situation. Subject to this predominant objective, the exchange rate policy is guided by the need to reduce *speculative activities*, help maintain an adequate level of reserves, and develop an orderly foreign exchange market.

Nominal vs real rate

"From a competitive point of view and also in the medium term perspective, it is the REER, which should be monitored as it reflects changes in the external value of a currency in relation to its trading partners in real terms. However, it is no good for monitoring short term and day-to-day movements as 'nominal' rates are the ones which are most sensitive of capital flows. Thus, in the short run, there is no option but to *monitor the nominal rate*." (Bimal Jalan, 2002)

Methodology and results

Alternative methodologies

1. Exchange rate flexibility
2. Volatility
3. Multi currency model
4. Market efficiency

Calvo-Reinhart metric of exchange rate flexibi

$$\lambda = \frac{\sigma_\epsilon^2}{\sigma_i^2 + \sigma_{R/p}^2}$$

σ_ϵ is the exchange rate volatility
σ_i is the interest rate volatility
$\sigma_{R/p}$ is the volatility of reserves expressed in local currency at constant prices

Calvo and Reinhart(2002)

Probability of a near non-change in the currency over a one-month horizon

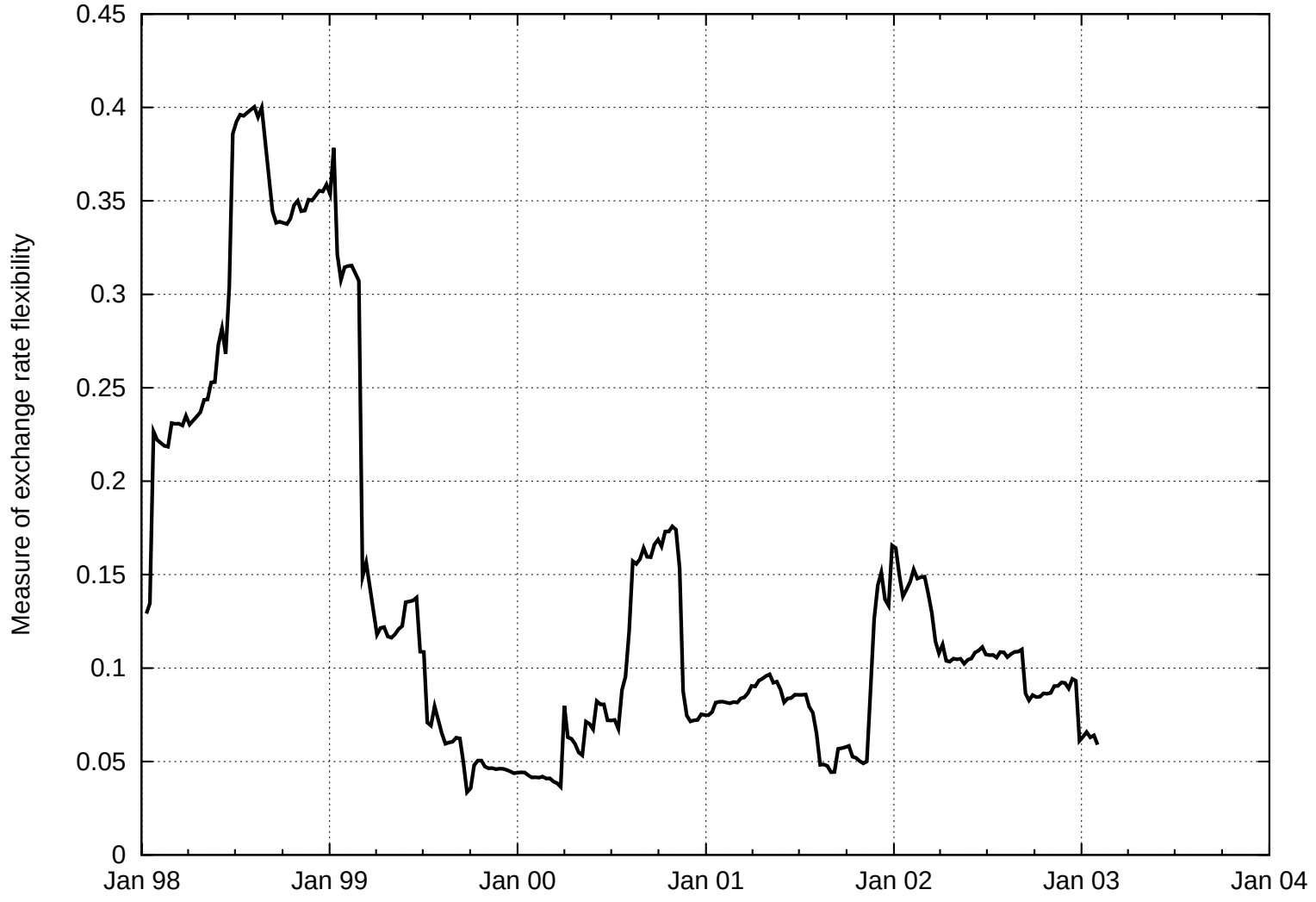
Feb 1979 to March 1993: 84.5

March 1993 to Nov 1999: 93.4

This suggests that the currency was *less* flexible in the "post-reforms" period after March 1993.

Using monthly data, they find that this metric takes the same low value of 0.03 for India in both the "pre-reforms period" (1979-1993) and the "post-reforms" period (1993-1999).

Time-series variation in λ



Results

Comparability We use weekly data.

Evidence We find that in the period after 1999 also, λ_t has remained at very low levels.

Conclusion Continued regime of little exchange rate flexibility.

Volatility

Hypothesis: INR is substantially pegged to the USD. Under this H_0

1. INR/USD volatility will be much lower than that of INR against other currencies.
2. The volatility of INR against other currencies will assume values of the kind seen with other cross-currency volatilities in the world.

Symptoms of pegging to USD

Daily sigma of returns (1/1/1999 onwards):

	USD	Euro	JPY
INR		0.72	0.73
USD		0.71	0.73
Euro			0.92

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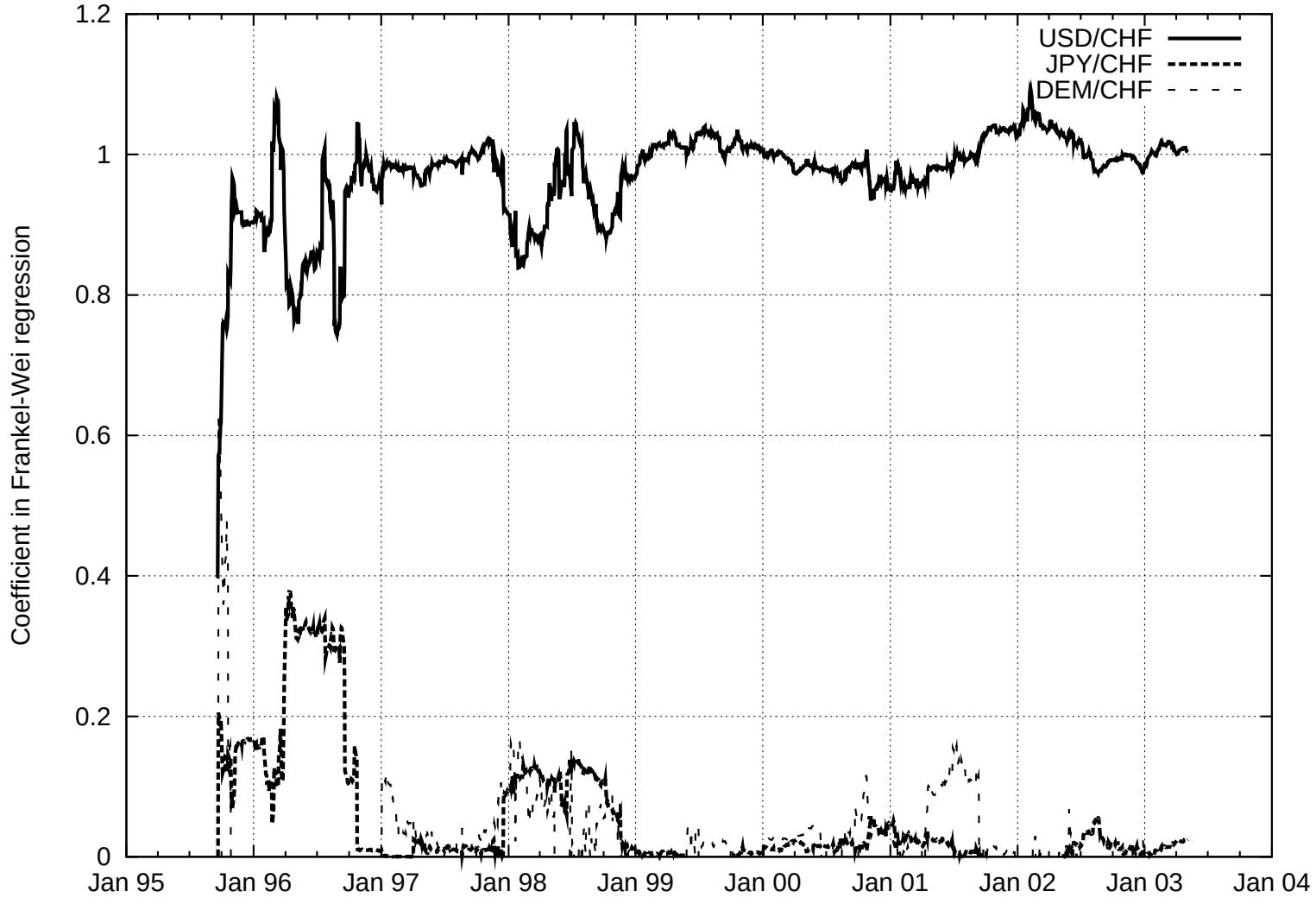
Regression based approach

Frankel and Wei (1994)

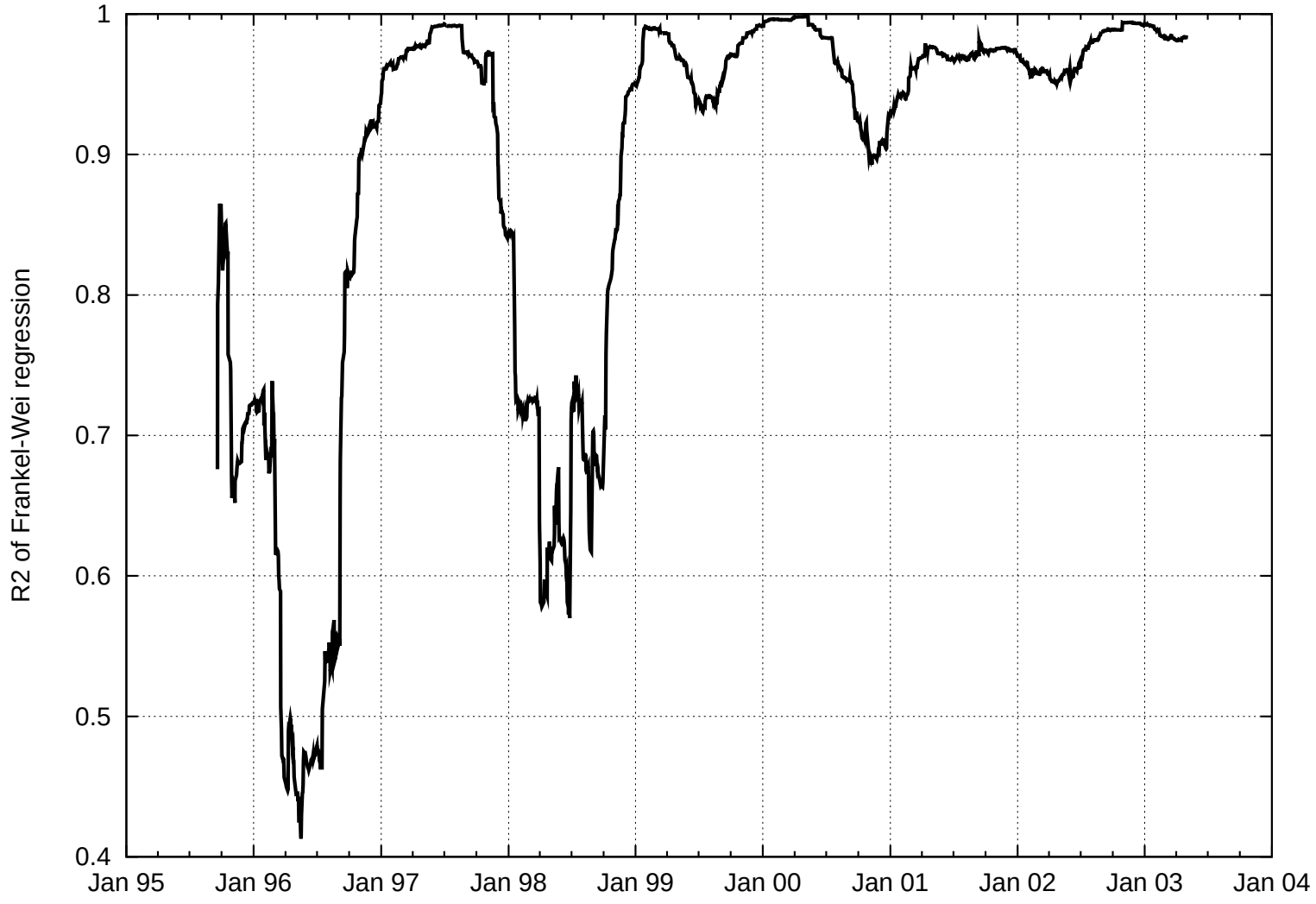
$$d\log\left(\frac{\text{INR}}{\text{CHF}}\right) = \beta_1 + \beta_2 d\log\left(\frac{\text{USD}}{\text{CHF}}\right) + \beta_3 d\log\left(\frac{\text{JPY}}{\text{CHF}}\right) + \beta_4 d\log\left(\frac{\text{DEM}}{\text{CHF}}\right) + \epsilon$$

If there is pegging to the USD, then $\beta_3 = \beta_4 = 0$ while $\beta_2 = 1$.
If there is no pegging, then all the three betas will be different from 0.
R^2 values near 1 suggest reduced exchange rate flexibility.

Rolling window regression (coefficients)



Rolling window regressions (R^2)



Market efficiency

Under the null of a crawling peg:

1. INR/USD will have symptoms of an inefficient market - violations of white noise.
2. INR against other currencies will not exhibit comparable symptoms.

Symptoms of pegging to USD

Prob value of Box-Ljung Q of daily returns:

	USD	Euro	JPY
INR		0.3050	0.3358
USD		0.3265	0.1349
Euro			0.2047

We cannot reject the null of a random walk for the three cross currency pairs between USD, Euro and JPY.

Symptoms of pegging to USD

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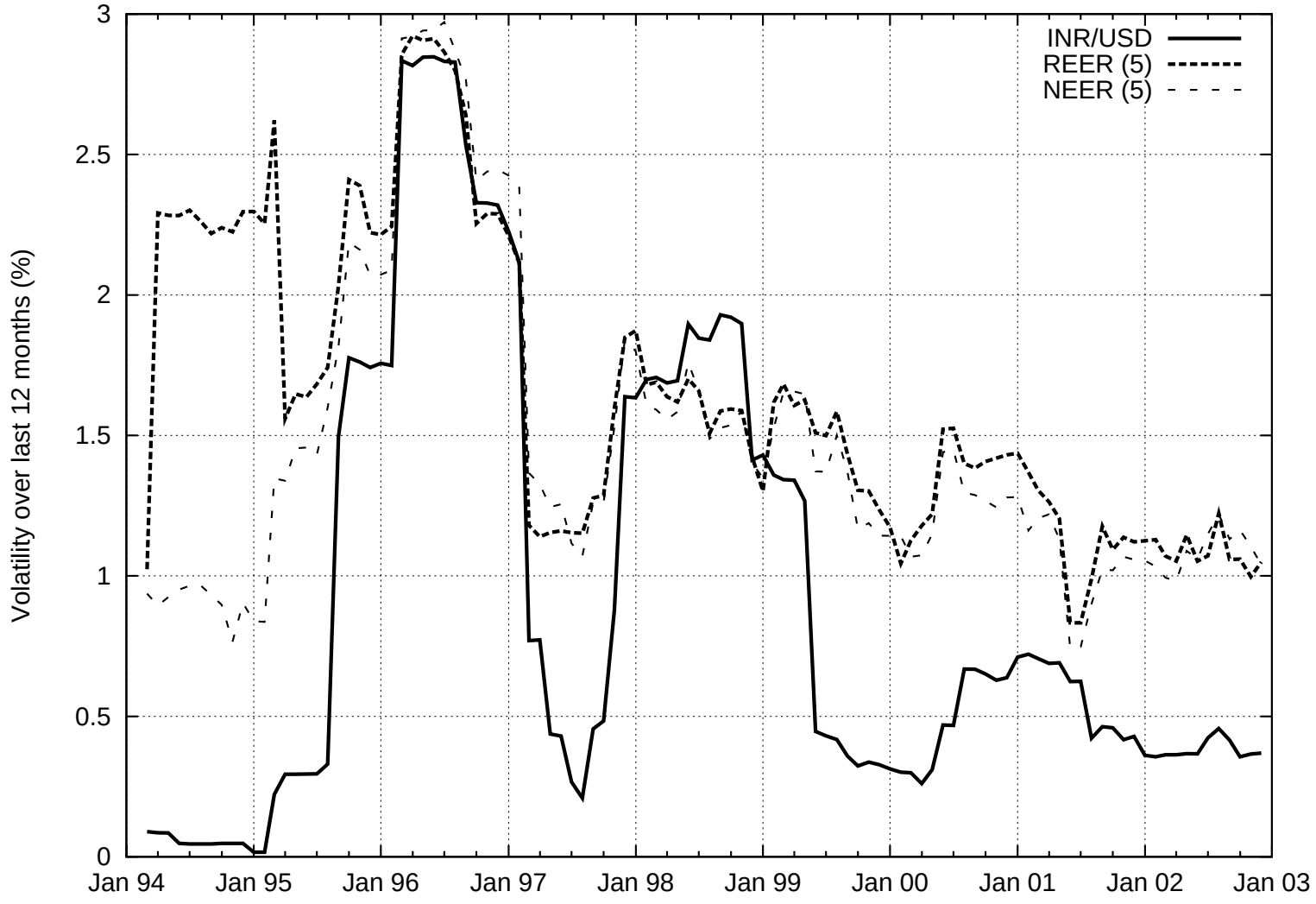
INR and USD: The null of a random walk is rejected at 94.2 per cent level.

Is the REER being targeted?

Rolling window volatilities



Conclusion

- The nominal INR/USD exhibits the lowest volatility.
- The rupee is a *de facto* peg to the US dollar.
- The build-up in reserves is a consequence of the currency policy.