

# Chapter 10

## Foreign Exchange Risk

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### Objectives

- Winners and losers from exchange rate appreciation and depreciation.
- Different exchange rate systems
- Prediction
- Reducing exposure

# Exchange rates and investments

Exchange rate changes can have big effects on international businesses.

- Acquisition price effect
- Return conversion effect
- Export revenues
- Import costs
- Debt interest payment costs

Example: how two companies performed following the 1997 Baht Crisis.

## Thailand's 1997 Baht Crisis

Daily Exchange Rates: Thai Baht per U.S. Dollar



# Confusion about depreciation

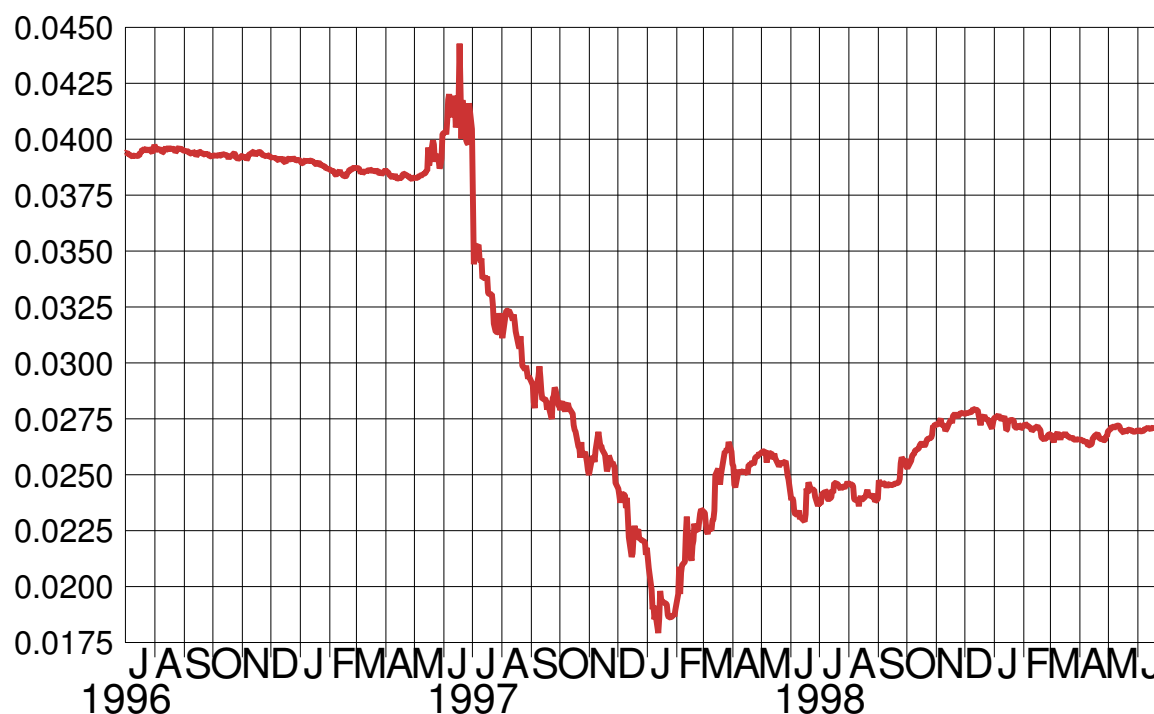
Any currency can be expressed in terms of local currency units (LCU) per foreign currency unit (FCU) or vice-versa.

When it is LCU/FCU (25 Baht/USD), a rise in  $e$  is a depreciation of local currency.

To express currency so that a rise in  $e$  is an *appreciation* of the local currency, use FCU/LCU.

## Baht depreciation = ↓

Daily Exchange Rates: U.S. Dollars per Thai Baht

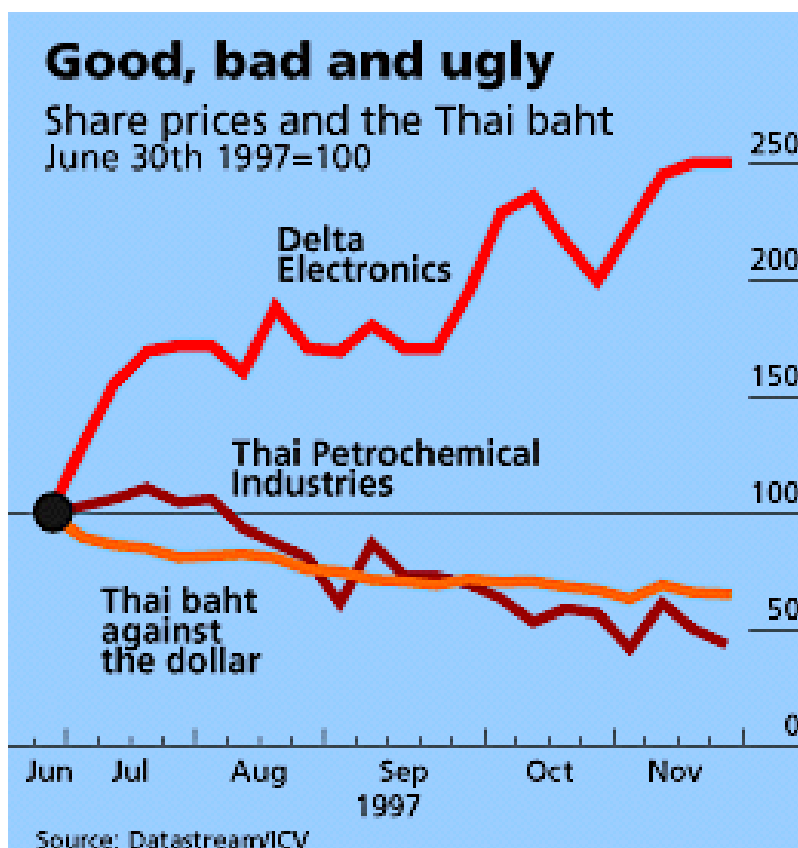


# Tale of 2 Companies

**Delta Electronics:** maker of electrical noise filters, power-supply parts, computer monitors  
main market: foreign electronics companies  
labour 8% share of costs  
main inputs: wires, plastic, steel, glass  
debt from local banks

**Thai Petrochemical Industries:** plastics, chemicals, cement  
main market: 70% domestic sales, cement market depends on local construction  
main input: crude oil  
debt denominated in USD.

## Winner and loser



# Tale of 2 Companies

**Delta Electronics** was a winner from Baht depreciation: share prices rose 150%. Profits up 39%

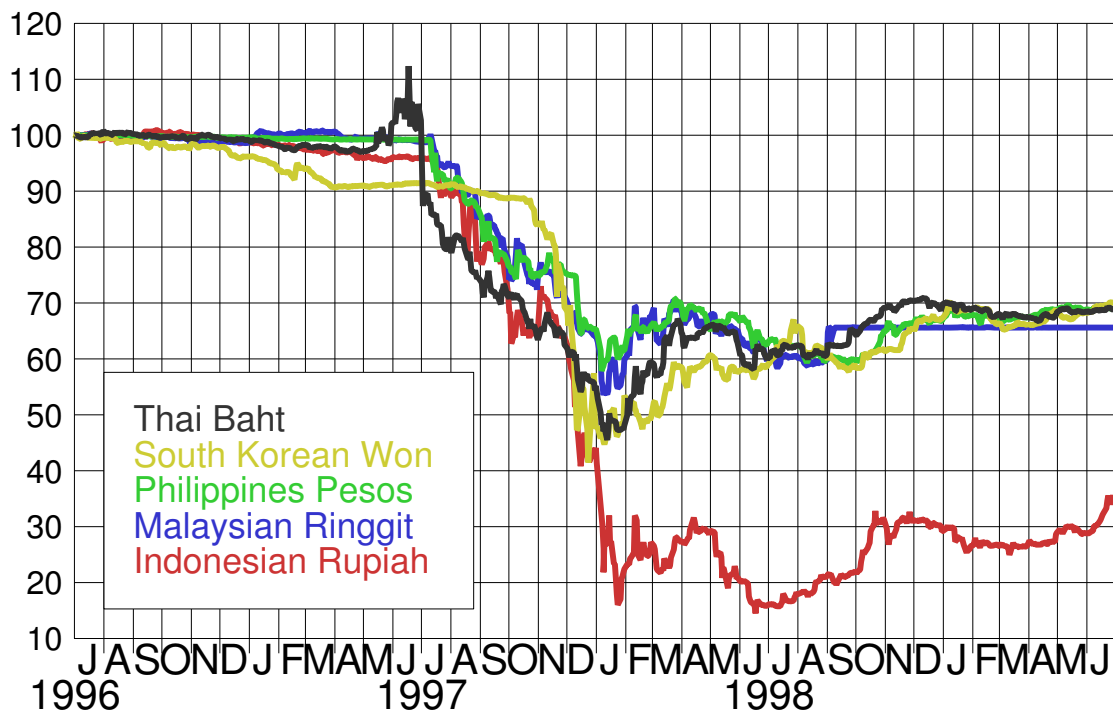
**Thai Petrochemical Industries:** was a big loser. lost billions of Baht, suspended interest on debt, had to sell assets.

What accounts for the big difference in performance?

Exports, Imported inputs, Debt denomination.  
DE would have done even better if not for...

## Asia Crisis (or Realignment?)

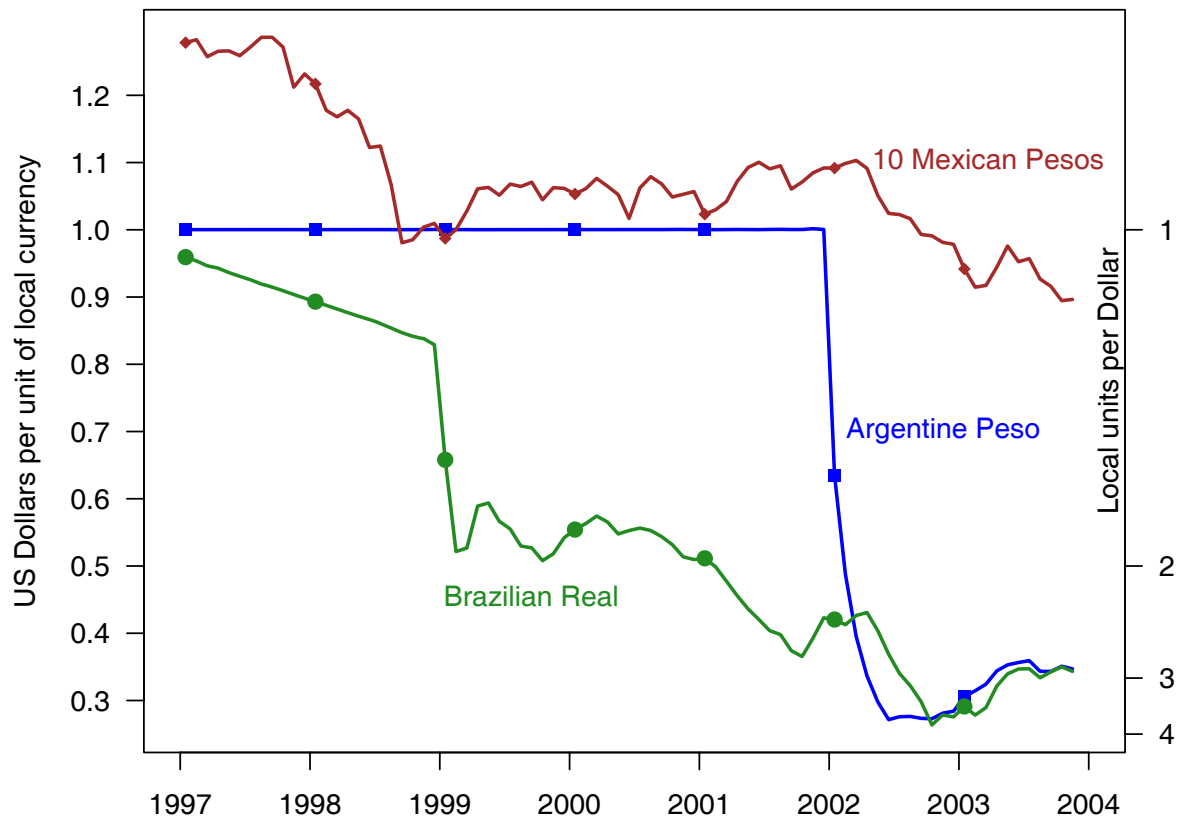
Comparative Daily Exchange Rates: Relative to U.S. Dollar



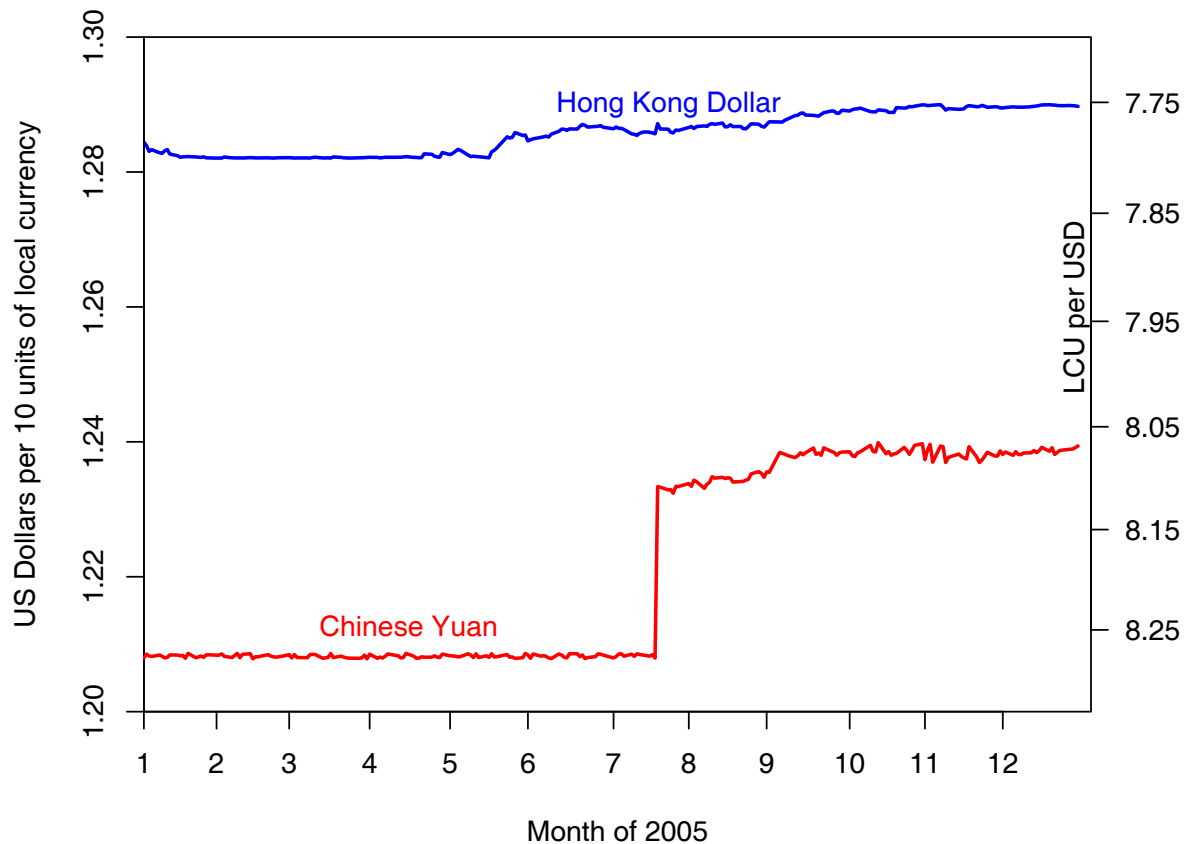
# Exchange Rate Systems

- Pure float
- managed/dirty float aka soft peg
- creeping peg
- fixed rates aka hard peg
- currency union (Euro) or adoption (Balboa)

## Creepers and Crashers



# Revaluing the Renminbi



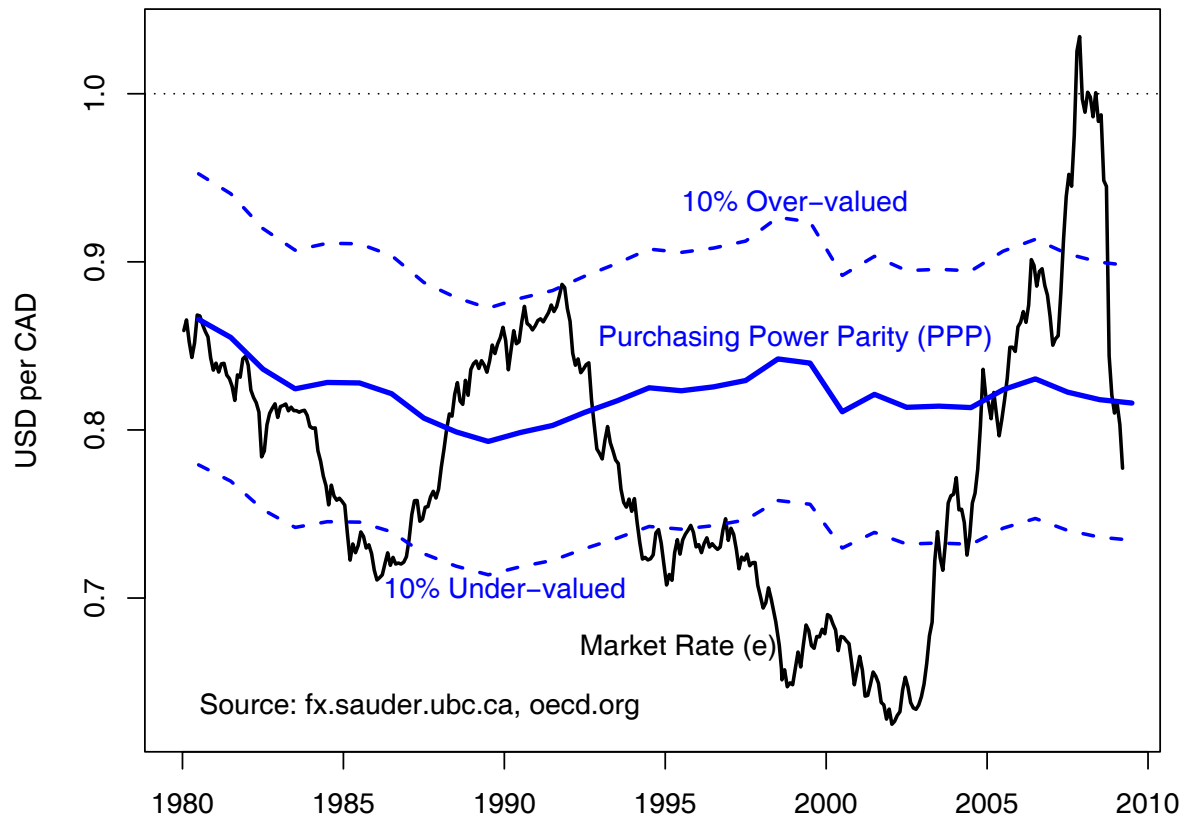
## Wanted: Good XR forecasts

Can we predict future exchange rate changes?

- Soros made a \$1.1 bn betting GBP would fall in 1992.
- Krugman correctly predicted USD depreciation in 1984 and MXP depreciation in 1993.
- I correctly predicted Canadian dollar appreciation in 2003.

To predict exchange rates correctly, you need a standard for determining over/under-valuation. You also need to be patient. I predicted CAD appreciation every year from 1993–2003!

# CAD, USD, and PPP



## Two fundamental standards

1. Parity (price): The exchange rate is over-valued when home prices are too high.
2. Equilibrium (quantity): The exchange rate is over-valued when the current account deficit is too large.
  - 2.1 Imports persistently more than exports.
  - 2.2 External debt growing at an unsustainable rate.
  - 2.3 Central bank running out of Reserves.

# Parity standards: an example

Prices of Big Macs in April, 2003

- Mexico: 23 MXP
- Canada: 3.20 CAD
- USA: 2.71 USD

A “parity” exchange rate is a hypothetical exchange rate, written as  $\bar{e}$  that would equalize price levels in the home and foreign country:

$$\bar{e}P^h = P^f \implies \bar{e} = P^f / P^h$$

Mexico:  $2.71/23 = .12$  USD/MXP

Canada:  $2.71/3.20 = .85$  USD/CAD

## Calculating over/under valuation

Market exchange rates on April 22nd, 2003

Canada: 0.69 USD/CAD    Mexico: .095 USD/MXP

Overvaluation = (Market – Parity)/Parity =  
 $(e - \bar{e})/\bar{e}$

Note: both rates expressed as FCU per LCU

Canada:  $(.69 - .85)/.85 = -.188 \implies 19\%$   
undervaluation

Mexico:  $(.095 - .12)/.12 = -.21 \implies 21\%$   
undervaluation

Another way of writing the overvaluation formula is as the percentage difference in prices expressed in FCUs.

Over/under valuation =  $(eP^h - P^f)/P^f$

# Does it work?

Q. Do over/under valuation calculations based on Big Mac parity predict future rates?

A. Sort of. For Canada we know exchange rate has appreciated a lot, from 0.69 to 0.85.

Based on latest *Economist*: Canadian dollar is very close to Big Mac parity rate.

$(3.08 - 3.22)/3.22 = -.04$ , or 4% undervalued.

But Mexican peso is still 18% undervalued.

So MXP did not appreciate appreciably. But don't forget Penn effect.

## Big Macs vs Lattes, 2004.01.15

**Our hot tips**  
Local currency under (-)/over (+) valuation against the dollar, %, using:

	Starbucks tall-latte index	McDonald's Big Mac index
Australia	-4	-17
Britain	+17	+23
Canada	-16	-16
China	-1	-56
Euro area	+33	+24
Hong Kong	+15	-45
Japan	+13	-12
Malaysia	-25	-53
Mexico	-15	-21
New Zealand	-12	-4
Singapore	+2	-31
South Korea	+6	0
Switzerland	+62	+82
Taiwan	-5	-21
Thailand	-31	-46
Turkey	+6	+5

Source: *The Economist*

# Purchasing power parity (PPP)

Using individual commodities like the Big Mac or Starbucks latte has advantages

- “hands-on” examples
- essentially same good everywhere

But: not safe to focus on one or two goods.

Economist focus on overall consumption bundles, such as Consumer Price Index.

Does PPP (Parity in CPIs) predict exchange rates?

Do over/under-valued exchange rates tend to become less so over time?

Yes, on average, but it takes years.

## Depreciation and inflation

Market exchange rates often differ from PPP rates. And poor countries usually have market rates below the PPP rate (Penn effect).

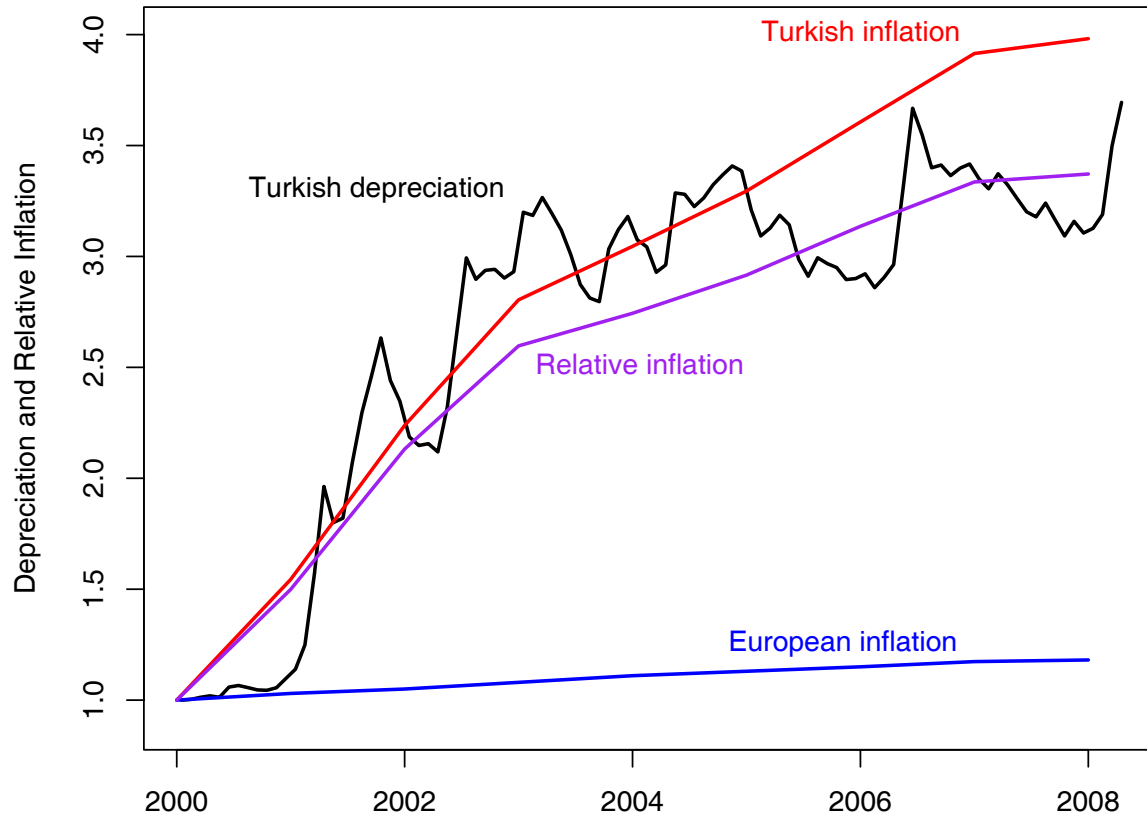
But if deviations from PPP get *too* large, no one will buy the products of the high-price economy.

Suppose we have a inflation at home that is bigger than inflation in foreign countries.

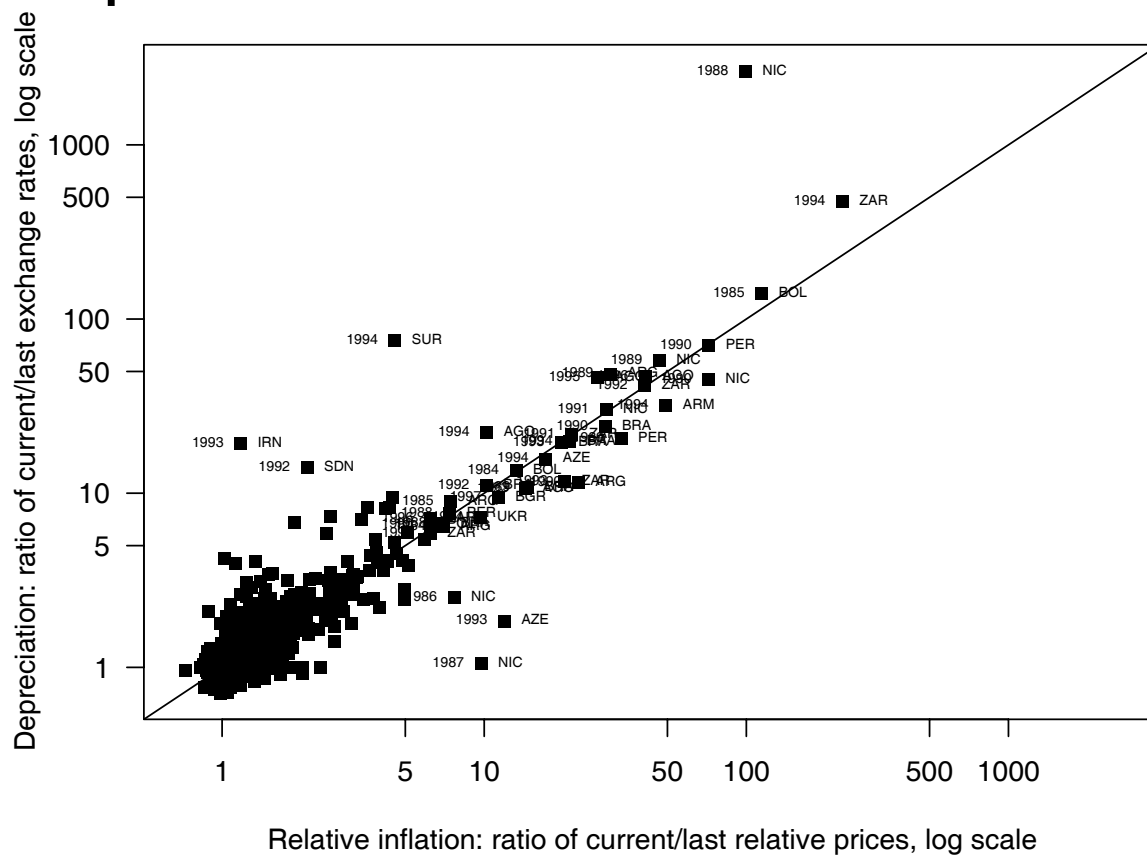
To prevent inflation from destroying home competitive advantages, home currency needs to depreciate.

To maintain the same relative price levels in a common currency, we need depreciation of an amount equal to relative inflation.

# Depreciation & inflation: Turkey



# Depreciation and inflation: World



# Equilibrium approach

The exchange rate is out of equilibrium if it leads to unsustainably large current account imbalances.

At 6.5% of GDP in 2006, the US Current Account Deficit (CAD) seemed unsustainably large.

The US is special: it could sustain current account deficits for many years because foreigners (first Japan and now China) have financed them by acquiring US assets.

Since 2006 the USD has depreciated relative to most currencies (and the current account deficit has shrunk to less than 5% of GDP)

## Thailand's 1996 imbalances

Thai baht was undervalued by PPP standard in 1996 and its inflation was not much larger than US inflation.

Was the Baht collapse predictable?

Perhaps. Use the equilibrium standard.

The current account deficit (CAD) rose from 5% to 8% of GDP in the 3 years leading up to crisis.

External debt rose relative to exports and reserves fell relative to imports.

# Exchange rates: the bottom line

Exchange rate changes can be large.

⇒ major effects on profits for exporter, import-buyers, and import-competitors

Fundamentals (parity and equilibrium) give some guidance to likely direction of future movements.

But they are not reliable short run indicators.

Some firms seek to lower risks by hedging.

For example, Delta Electronics could have hedged itself by borrowing in USD. Luckily, it did not...

Investors could hedge by holding stock in DE and TPI.