

# The current account, exchange rates etc

## ECON4330 Spring 2010 Lecture 11

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## Part I

### The price specie-flow model (continued)

# The model

IS-curve:

$$Y = C\left(Y - i_* \frac{EF_*}{P} - G, -\frac{EF_*}{P} - W_g, i, i_*\right) + G + X\left(\frac{EP_*}{P}, Y, Y_*\right) \quad (1)$$

Phillips-curve:

$$\dot{P} = P\gamma(Y - \bar{Y}) \quad (2)$$

Accumulation of foreign debt:

$$\dot{F}_* = i_* F_* - \frac{P}{E} X\left(\frac{EP_*}{P}, Y, Y_*\right) \quad (3)$$

Note homogeneity:  $E$  and  $P$  always appear as  $E/P$

Endogenous variables:  $Y$ ,  $P$  and  $F_*$

Initial cond:  $P(0) = P_0$ ,  $F_*(0) = F_{*0}$ ,  $W_g(0) = (-M_0 - B_0 + E(0)F_{g0})/P_0$

## The temporary equilibrium

$$Y = C\left(Y - i_* \frac{EF_*}{P} - G, -\frac{EF_*}{P} - W_g, i, i_*\right) + G + X\left(\frac{EP_*}{P}, Y, Y_*\right)$$

IS-equation determines  $Y$  given  $P$  and  $F_*$ .

Solution:

$$Y = Y(P, F_*, \mathbf{x}), \quad \mathbf{x} = (i_*, P_*, Y_*, G, i, E, W_g) \quad (4)$$

Increased foreign debt,  $F_*$ , reduces consumption demand and output

$$\frac{\partial Y}{\partial F_*} < 0, \quad \frac{\partial Y}{\partial P} < 0$$

$\partial Y / \partial P < 0$  assumes real exchange rate effect dominates over an eventual positive wealth effect.

## The dynamic equations

$$\dot{P} = \phi_1(P, F_*, \mathbf{x}) = P\gamma[Y(P, F_*, \mathbf{x}) - \bar{Y}] \quad (5)$$

$$\dot{F}_* = \phi_2(P, F_*, \mathbf{x}) = i_*F_* - PX(EP_*/P, Y(P, F_*, \mathbf{x}), Y_*)/E \quad (6)$$

## Our assumptions

$\phi_{11} < 0$  follows from  $\partial Y / \partial P < 0$

$\phi_{12} < 0$  follows from  $\partial Y / \partial F_* < 0$

$\phi_{21} > 0$  assuming that real exchange rate effect dominates if wealth effect is negative

$\phi_{22} < 0$  assuming that effect on trade surplus dominates over effect on interest payments

## The stationary equilibrium

$$\dot{P} = \phi_1(P, F_*, \mathbf{x}) = 0 \Leftrightarrow Y = Y(P, F_*, \mathbf{x}) = \bar{Y} \quad (7)$$

$$\dot{F}_* = \phi_2(P, F_*, \mathbf{x}) = 0 \Leftrightarrow PX(EP_*/P, Y, Y_*) = i_*EF_* \quad (8)$$

(7) - internal balance - and (8) - external balance - determine  $F_*$  and  $P$

### Solution is recursive

$Y$  determined by supply (capacity)

$W'_*$  determined by savings behavior

$$C(\bar{Y} - i_*W'_* - G, -W'_* - W_g, i, i_*) + G = \bar{Y} - i_*W'_*$$

$R$  determined by demand for exports and imports

$$i_*W'_* = X(R, \bar{Y}, Y_*)$$

$P$  determined by exchange rate,  $P = EP_*/R$

## Stability conditions

Jacobian matrix

$$A = \begin{bmatrix} \phi_{11} & \phi_{12} \\ \phi_{21} & \phi_{22} \end{bmatrix}$$

Necessary and sufficient conditions for stability:

$$\text{tr}(A) = \phi_{11} + \phi_{22} < 0$$

and

$$|A| = \phi_{11}\phi_{22} - \phi_{12}\phi_{21} > 0$$

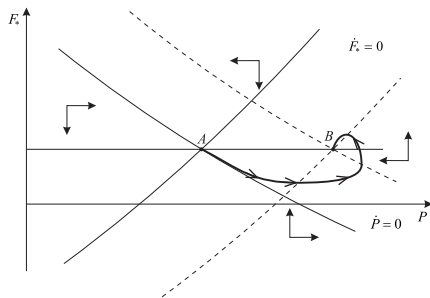
$$|A| > 0 \iff i_*(1 - C_Y) - C_W < 0$$

Or:

$|A| > 0 \iff$  Foreign debt up  $\rightarrow$  savings up ( $Y$  constant)

$\phi_{22} < 0$  - Foreign debt up  $\rightarrow$  savings up even in the short run when  $Y$  is down.

## A devaluation (Assuming $F_{g0} = 0$ )



Long run:  $R$  and  $F_*$  not affected

Current account improves, curve for external balance shifts to the right

Output increases, curve for internal balance shifts to the right

Shifts equal in size (only  $E/P$  matters)

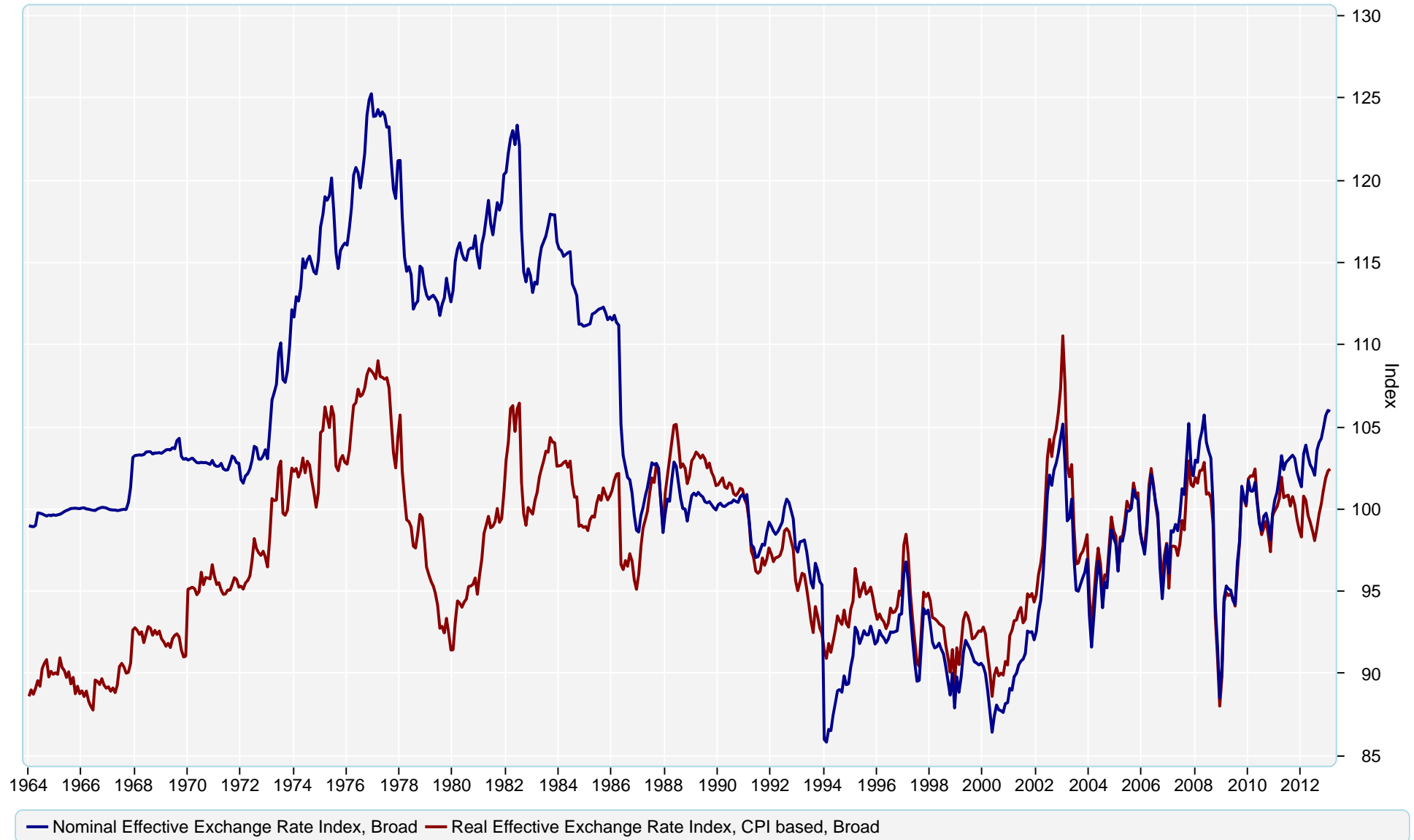
First boom, then recession

Devaluation cycles

Norway's devaluation decade  
1977-86

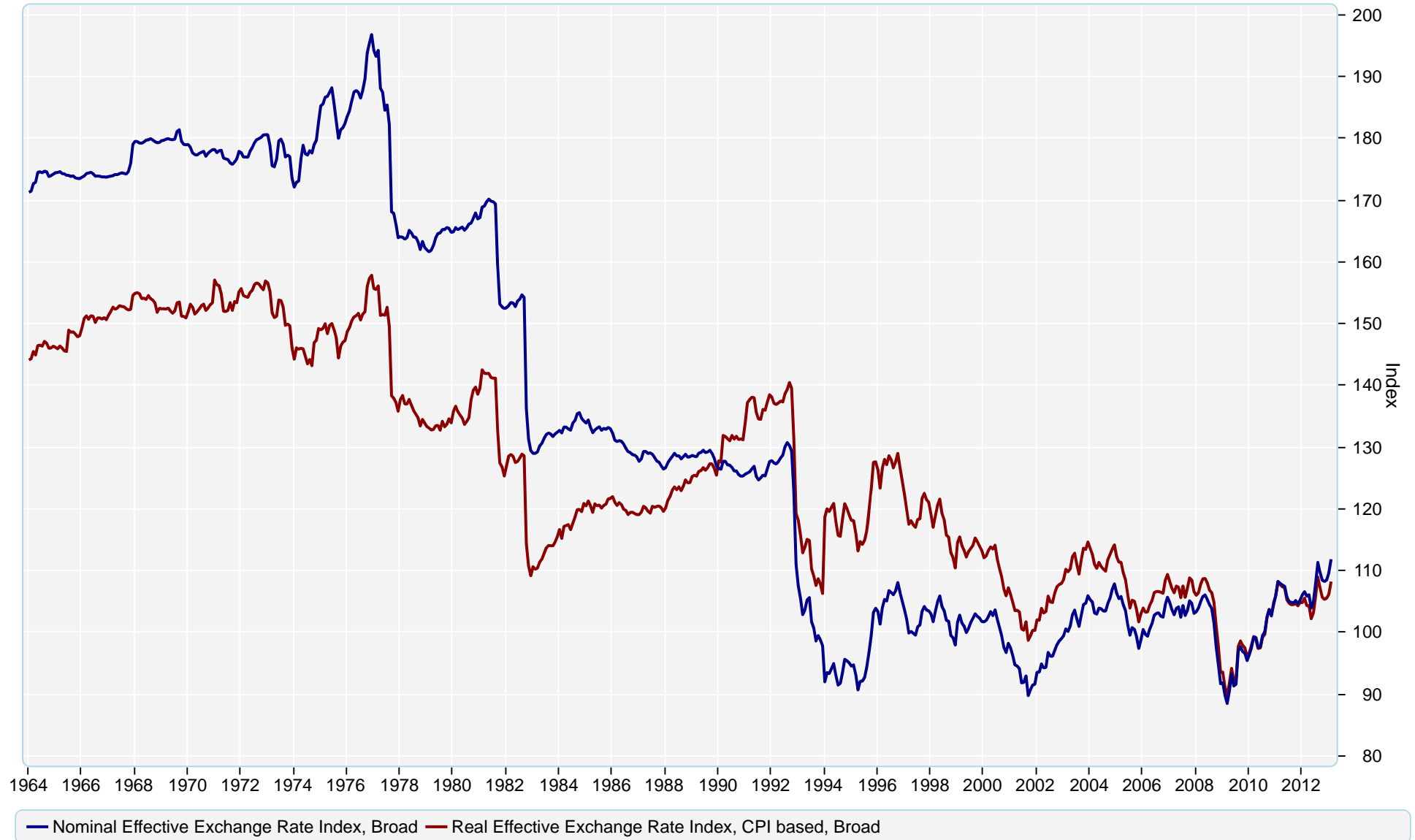


### Norway, FX Indices, BIS

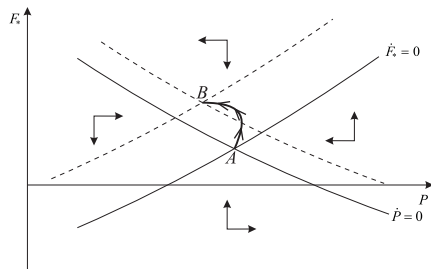


Source: **Macrobond**

### Sweden, FX Indices, BIS



# The effect of easier access to credit



Positive shift in domestic demand

Internal balance requires higher prices

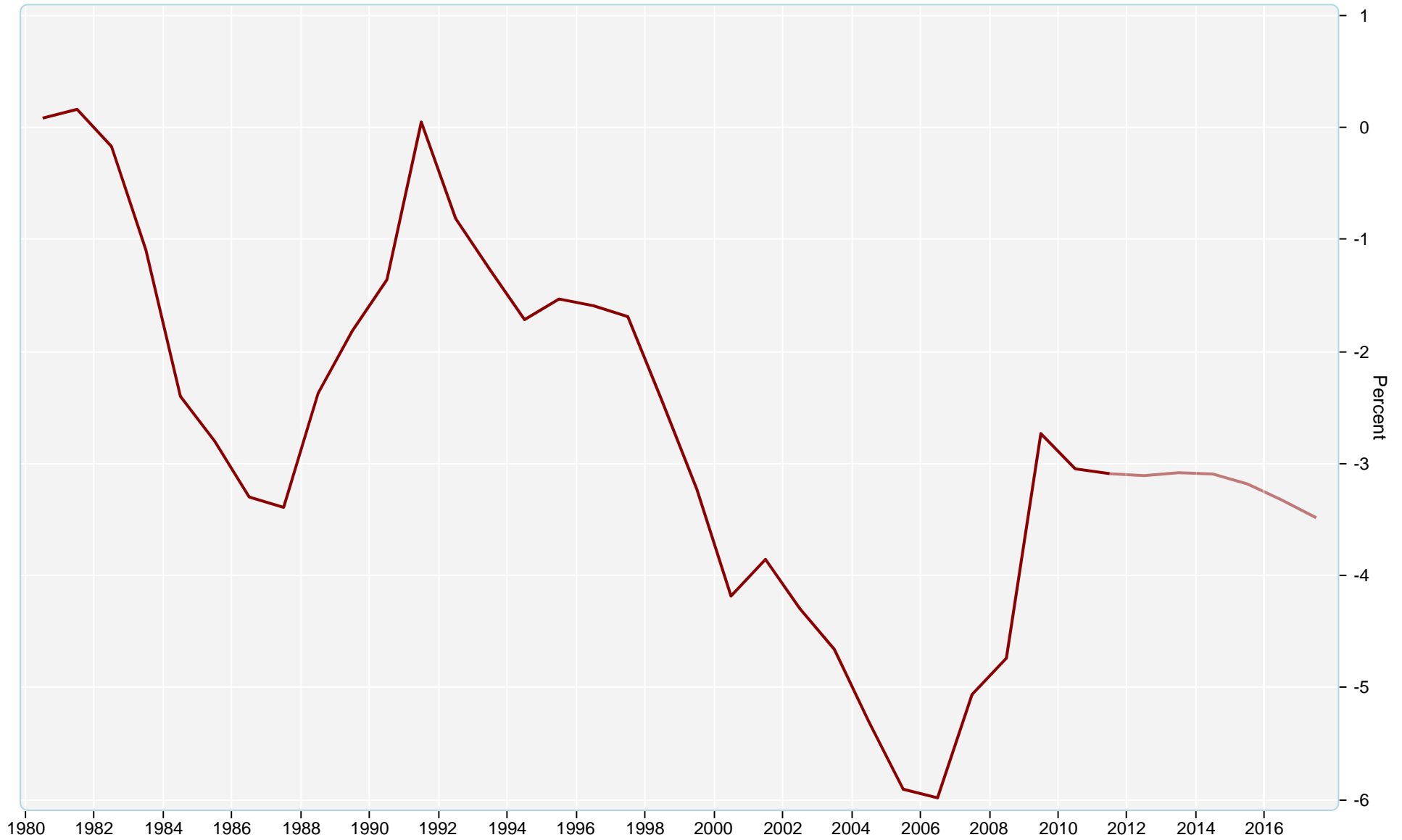
External balance requires lower prices

First boom, then recession

Prices increase first, then fall below initial level

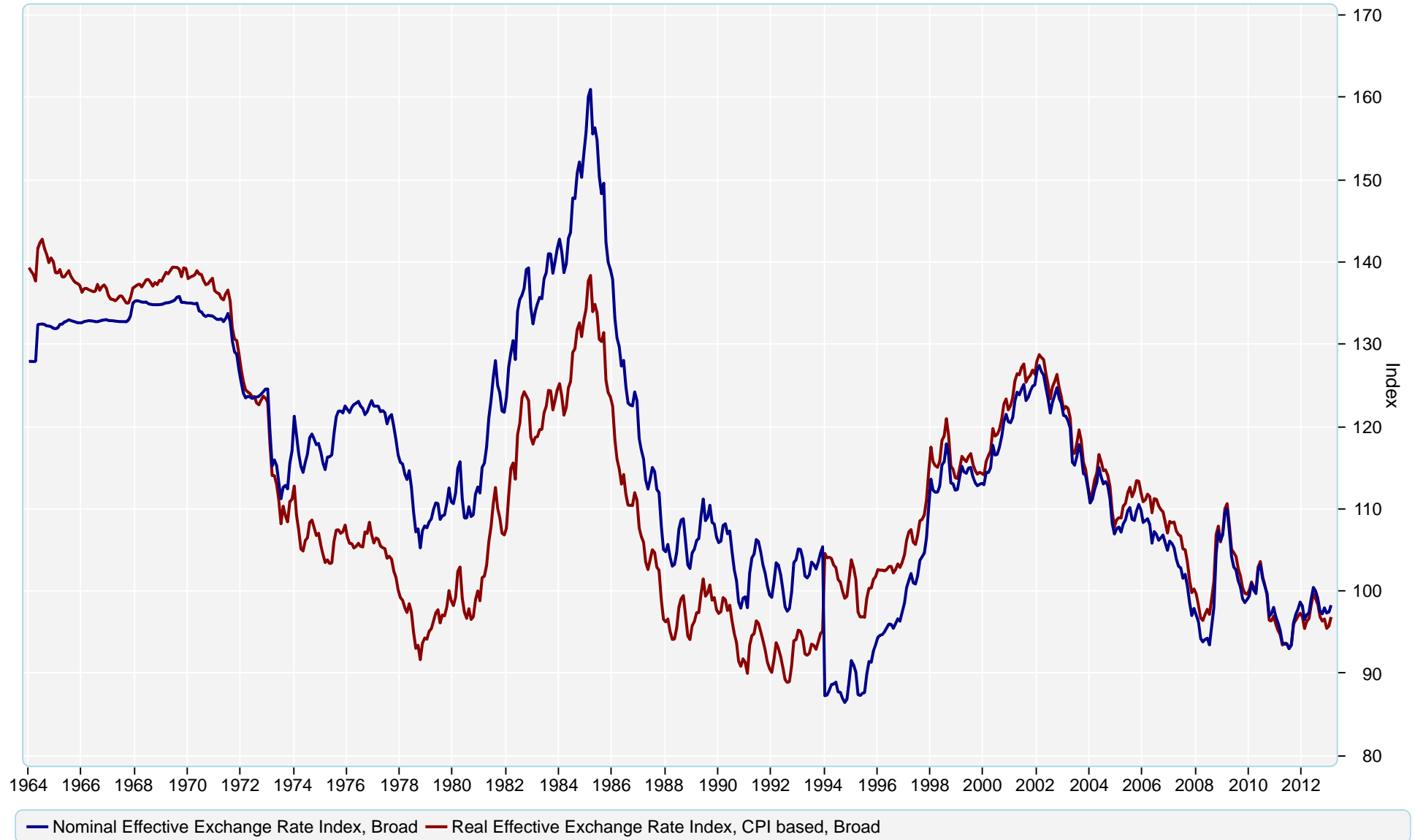
Approach may be cyclic

United States, Current Account Balance, IMF WEO, Estimate, Percent of GDP



Source: **Macrobond**

### United States, FX Indices, BIS



Source: **Macrobond**

## Devaluation as response to negative shift in savings propensity

- ▶ Current account improved in the short run
- ▶ Later deficit will be larger, total change in  $F_*$  the same
- ▶ Transition takes place with more inflation and less unemployment
- ▶ May leave legacy of increased inflation expectations
- ▶ Policies designed to break inflationary expectations may create unemployment later

## Extended model

Phillips-curve augmented with expected consumer price inflation

$$\dot{P}/P = (\dot{P}_C/P_C)^e + \gamma(Y - \bar{Y})$$

Model consistent expectations

Floating exchange rate

- ▶ Same dynamics for foreign debt and for the real exchange rate
- ▶ Replace  $P$  by  $1/R$  on the horizontal axis
- ▶ Initial  $R$  not given, but determined by monetary policy and expectations
- ▶ Once initial exchange rate has been determined, expected future dynamics are as with fixed rate

# Floating exchange rate, target for producer price inflation

## Assumptions

$i$  is used to keep  $P$  constant by keeping  $Y = \bar{Y}$

Perfect capital mobility

## The effect of easier access to credit

- ▶ Long run equilibrium: Higher foreign debt, depreciated real *and nominal* exchange rate
- ▶ Short run: Higher interest rate, appreciated exchange rate, current account deficit
- ▶ The path between: Gradual depreciation, gradual increase in foreign debt, equilibrium output
- ▶ Consumer prices first fall, then increase gradually, end up higher than initially



# Summing up on current account imbalances 1

- ▶ Persistent imbalances are caused by real factors, mainly saving and investment behavior
- ▶ Imbalances tend to self correct towards sustainable levels without need for policy intervention
- ▶ Government action is required if imbalance stems from government deficit
- ▶ Correction of persistent imbalances usually requires change in real exchange rate. Price level or nominal exchange rate must change.
- ▶ During the adjustment to long-run equilibrium countries may have to go through a period of unemployment

## Summing up on current account imbalances 2

- ▶ Devaluations affect the timing of deficits, but not the sum of deficits over time
- ▶ Surprise devaluation may ease transition, but encourage future speculation and inflation
- ▶ Devaluation best suited when home country in recession, rest of the world in boom
- ▶ Floating exchange rate: Level is determined in asset market, not in market for exports and imports
- ▶ Impact of shocks on exchange rate depends on monetary policy
- ▶ Temporary supply shocks and domestic demand shocks affect output in the same direction, trade balance in opposite direction

# US is special

- ▷ Foreign debt mainly in domestic currency
- ▷ Foreign assets often in foreign currency
- ▷ Depreciation of the US dollar reduces US debt burden
- ▷ Less need for saving in US
- ▷ Higher current account deficits?