Exchange Rates and the Current Account

1.) The effects of the (real) ex. rate on the Current Acct. have been an important ingredient in our analysis.

2.) However, so far, we have only looked at one side of the coin. Current Account imbalances induce international wealth redistributions, which can then feedback to influence the (real) ex. rate.

3.) CA def $\Longrightarrow$ $W\downarrow$, $W^*\uparrow$

CA surp. $\Longrightarrow$ $W\uparrow$, $W^*\downarrow$

4.) Empirical Fact: Home bias in consumption.
Domestic residents spend a higher fraction of their income on Home goods than do Foreigners.

5.) This implies that over time CA deficits lead to a shift of expenditure away from domestic goods, thus causing a (real) depreciation

Schematic of a Dynamic System

1.) $CA_t = a \cdot q_{t-j}$ } Lagged effect of ex. rate on CA. Standard competitiveness effect

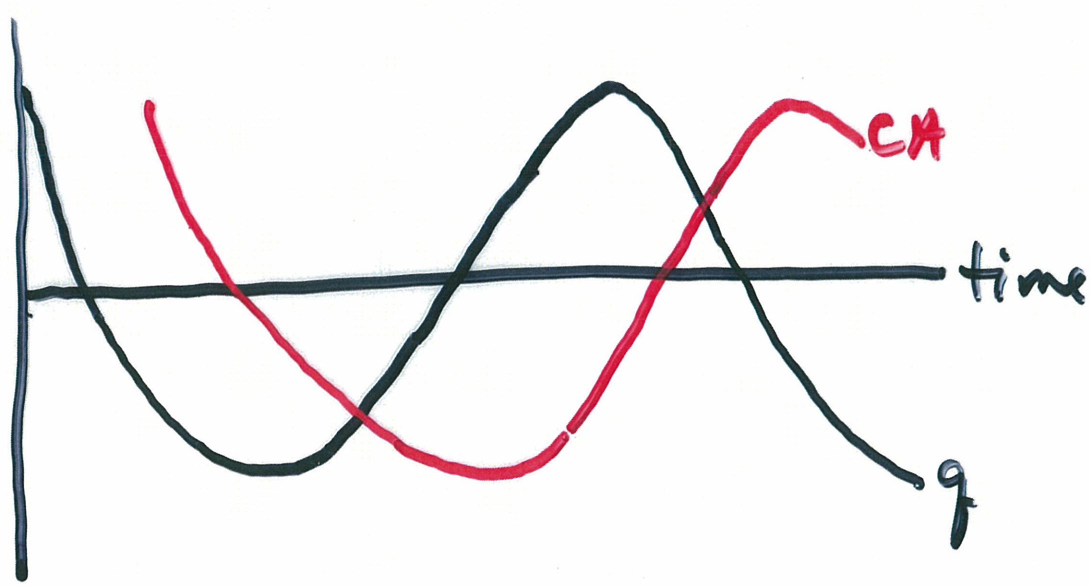
2.) $W_{t+1} = W_t + CA_t$ } Accounting Identities

$W^*_{t+1} = W^*_t - CA_t$

3.) $q_t = -b\,(W_t - W^*_t)$ } Home bias / Transfer Effect

$q_t \uparrow \Longrightarrow CA_{t+j} \uparrow \Longrightarrow W_{t+j+1} - W^*_{t+j+1} \uparrow \Longrightarrow q_{t+j+1} \downarrow$

$\Longrightarrow CA_{t+2j+1} \downarrow$



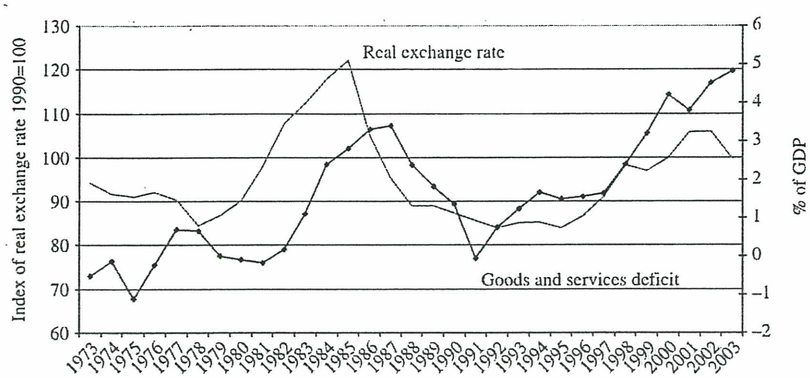
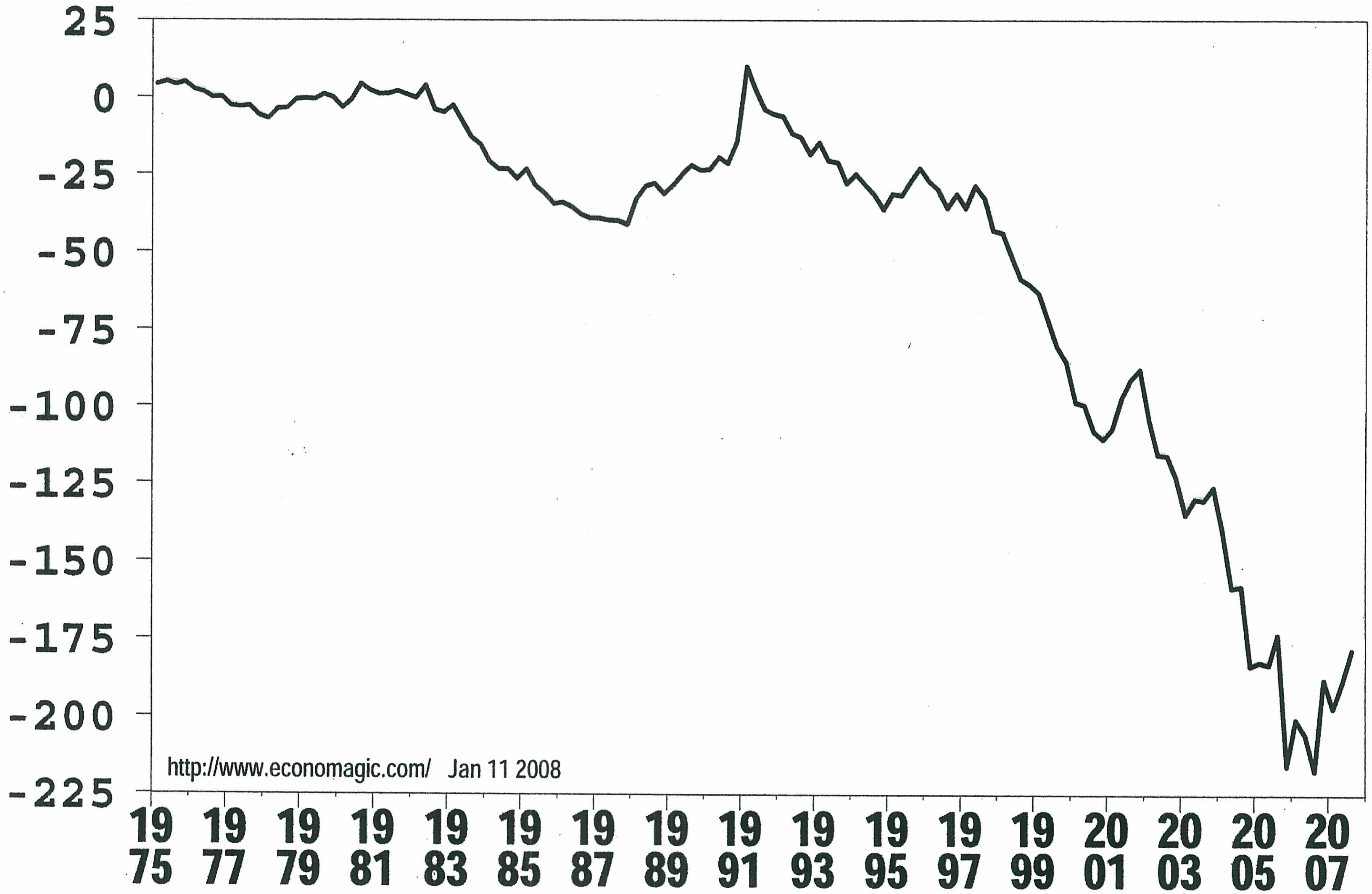


Figure 2. Real exchange rates, external balance, and the secular dollar trend

Source: OECD Economic Outlook database.

Balance on Current Account: Billions of Dollars: SA



Comment on Current Account "Sustainability"

Observation 1: It is often claimed that countries cannot run CA deficits forever. Eventually, a "day of reckoning" must come.

Observation 2: "Equilibrium" Real Ex. Rates often defined by the requirement that eventually, the CA is "in balance".

Do these make sense?

Consider a small open economy with the following characteristics:

Preferences

$$\max_{C_t} \sum_{j=0}^{\infty} \beta^j \log(C_{t+j})$$

(Exogenous) Income

$$Y_t = (1+g)\, Y_{t-1} \qquad Y_0 \text{ given}$$

Budget Constraint

$$B_{t+1} = (1+r)\, B_t + Y_t - C_t \qquad B_t = \text{Net Foreign Assets}$$

Current Account Identity

$$CA_t = B_{t+1} - B_t = r B_t + Y_t - C_t$$

Optimal Consumption Plan (Assuming $\beta = \frac{1}{1+r}$)

$$C_t = r B_t + \frac{r}{1+r} \sum_{j=0}^{\infty} \left(\frac{1}{1+r}\right)^j Y_{t+j}$$

$$= r B_t + \frac{r}{r-g}\, Y_t$$

Implications for CA and Foreign Debt

$$CA_t = rB_t + Y_t - \left(rB_t + \frac{r}{r-g} Y_t \right)$$

$$= \frac{-g}{r-g} Y_t$$

Define $b_t = B_t / Y_t$ = Foreign Asset/GDP ratio

$$B_{t+1} = B_t + CA_t$$

$$\frac{B_{t+1}}{Y_{t+1}} \cdot \frac{Y_{t+1}}{Y_t} = \frac{B_t}{Y_t} + \frac{CA_t}{Y_t}$$

Therefore,

$$b_{t+1} = \frac{1}{1+g} \left(b_t - \frac{g}{r-g} \right)$$

$$\boxed{\lim_{t \to \infty} b_t = -\frac{1}{r-g}}$$

Comments

1.) With growth, countries can have <u>permanent</u> CA deficits!

2.) Countries do not have to "pay off" their foreign debt. In fact, foreign debt can grow forever!

3.) Optimal CA/GDP and debt/GDP ratios can be <u>very</u> large.

<u>Example</u>: Suppose $r = .05$ and $g = .01$

Then $-CA/Y = 25\%$!

$-b_\infty = 25$!

Caveats

1.) Default! Countries may become unable or unwilling to service their foreign debts. Path of income may be uncertain. This tempers lenders willingness to lend in the first place.

2.) People may not have infinite planning horizons.

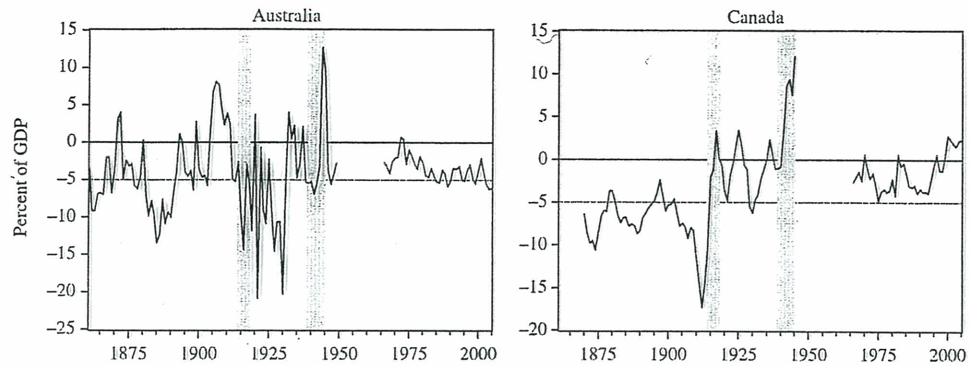


Figure 4. Current account as a percentage of GDP, Australia and Canada, 1861–2005

Note: The shaded areas refer to the two world wars.

Source: Jones and Obstfeld (2001), *World Development Indicators*.

Krugman Synopsis

1.) CA balance/stabilization will eventually require a real depreciation of the dollar.

2.) Question : Will this decline be gradual or sudden?

3.) Answer : It depends on investors' expectations.

4.) We can guage the "rationality" of expectations in 2 steps:

a.) Compute an average annual rate of depreciation consistent with a "sustainable" foreign debt level.

b.) Look at intl. real interest rate differentials to see whether investors are anticipating this.

5.) If it's sudden, what will be the macroeconomi consequences?

A Simple Model

D: Foreign Debt / GDP ratio

x: (real) value of domestic currency

$x\uparrow \Longrightarrow$ real appreciation

x + D determined by 2 (dynamic) equations

1.) $x = X(\overset{-}{D}, \overset{+}{\dot{x}^e})$ } Portfolio Balance Equation

$D\uparrow \Longrightarrow$ Foreigners must hold higher share of domestic assets

$\Longrightarrow$ must lower price of domestic assets

$\Longrightarrow x\downarrow$

$\dot{x}^e\uparrow \Longrightarrow$ Expected capital gain on domestic assets

$\Longrightarrow$ Current value of currency$\uparrow$

2.) $\dot{D} = B(\overset{+}{x}, \overset{+}{D}, \overset{+}{\dot{x}})$ } Current Acct. Equation Aggregate Wealth Dynamics

$x\uparrow \Longrightarrow$ Domestic goods become relatively expensive

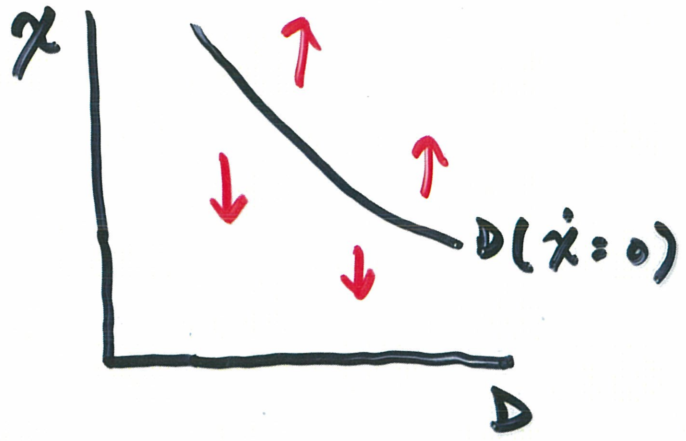
$\Longrightarrow$ CA deficit

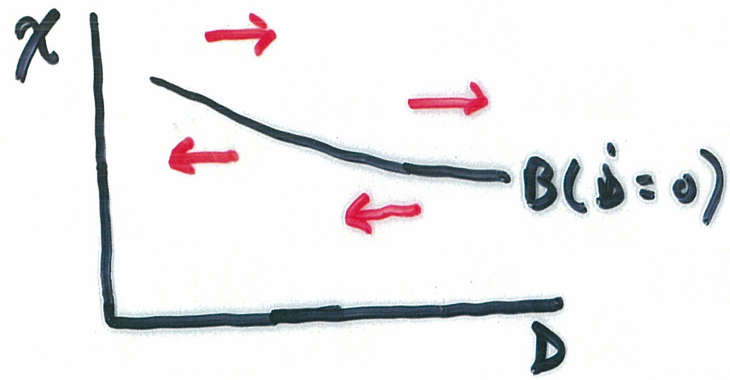
$\Longrightarrow \dot{D}\uparrow$

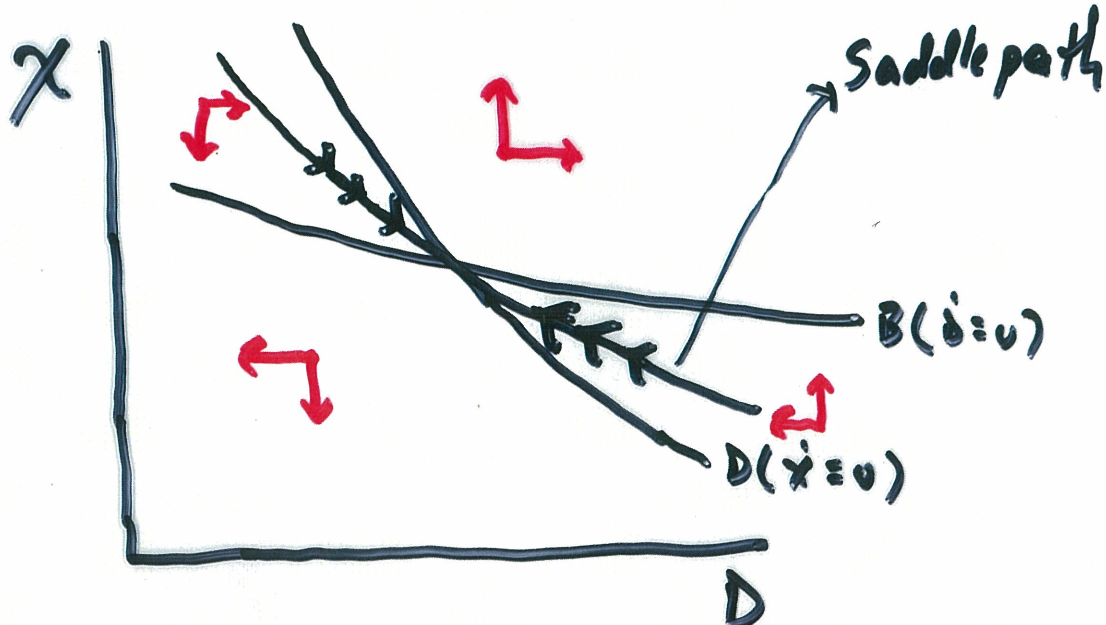
$D\uparrow \Longrightarrow$ higher interest payments (net of growth)

$\dot{x}\uparrow \Longrightarrow$ Valuation effects [U.S. liabs. in \$ U.S. foreign assets in foreign currency]

Phase Diagram







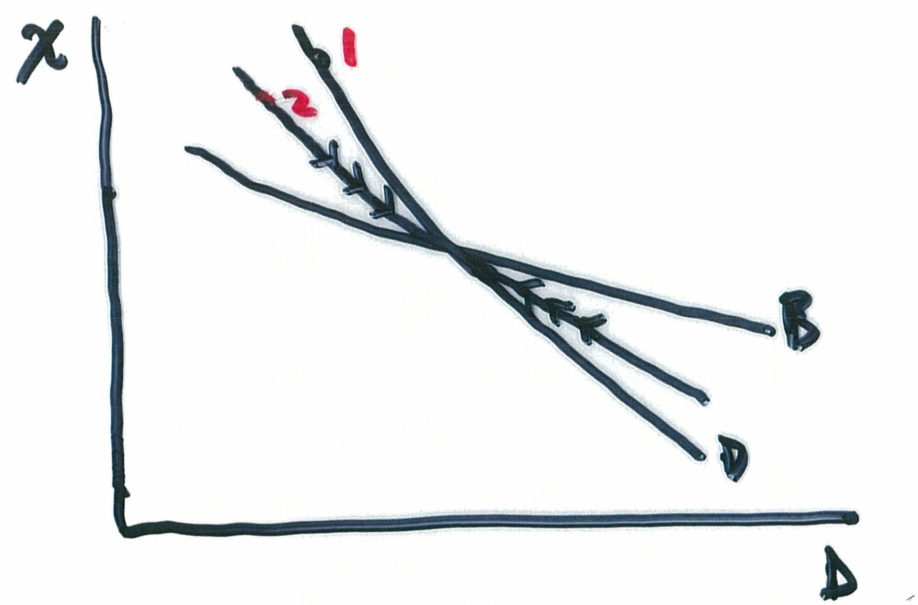
Note: Along saddlepath CA deficits associated with depreciating currency

Graphical Depiction of a "Dollar Crisis"

Suppose investors are at pt. 1, with no expected depreciation.

Then, all of a sudden, their expectations become "rational".

This produces a sudden depreciation of the ex. rate, to pt. 2 (on the saddlepath).



That is, a dollar crisis is a sudden switch from myopic to rational expectations.

Is this likely?

How big will the jump be?

Computing the Required Depreciation

Key Point: Domestic Output Consists of Both Tradeable + Nontradeable Goods

Closing the CA deficit requires a reduction in tradeables consumption

This may require a sizeable % change in tradeable's consumption.

$$\boxed{\frac{\Delta C_T}{Y} = \frac{\Delta C_T}{C_T} \times \frac{C_T}{Y} = -.06}$$

$$\frac{C_T}{Y} \approx .25 \implies \frac{\Delta C_T}{C_T} = -.24$$

How much must the real ex. rate change to produce a 24% drop in tradeables consumption?

It depends on the elasticity of subst. between tradeables + nontradeables!

Low elast. $\implies$ Big ex. rate change.

Computing an Annualized Percentage Change

Along the saddlepath,

$$\dot{D} = \dot{D}_0 e^{-\lambda t} \qquad \lambda = \overset{\text{stable}}{\text{eigenvalue}}$$

Integrate both sides ($\dot{D}_0$ is given)

$$\bar{D} = D_0 + \frac{\dot{D}_0}{\lambda}$$

Slow convergence (low λ) $\Rightarrow$ High final debt

λ	$\dot{D}_0$	$\bar{D}$	Initial rate of Depr.
.05	.049	1.18	.0175
.10	.038	.58	.035
			$\checkmark$
			$\lambda \times .35$

How does the rate of depreciation match up with real interest differentials?