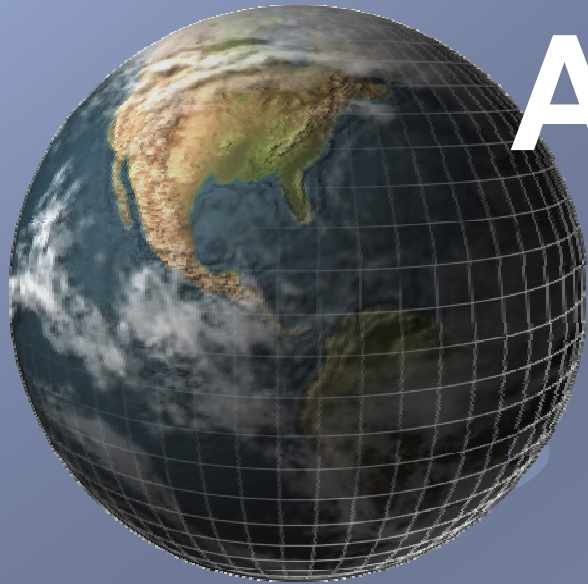# Global Imbalances and External Adjustment

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Outline

- Long-run trends in financial integration
- Two-way diversification in the 21st century
- The current pattern of global imbalances
- Net foreign asset changes versus current account balances: role of exchange rates
- Empirics and theories of adjustment
- Exchange rate effects of U.S. adjustment
- Does the current account still matter?
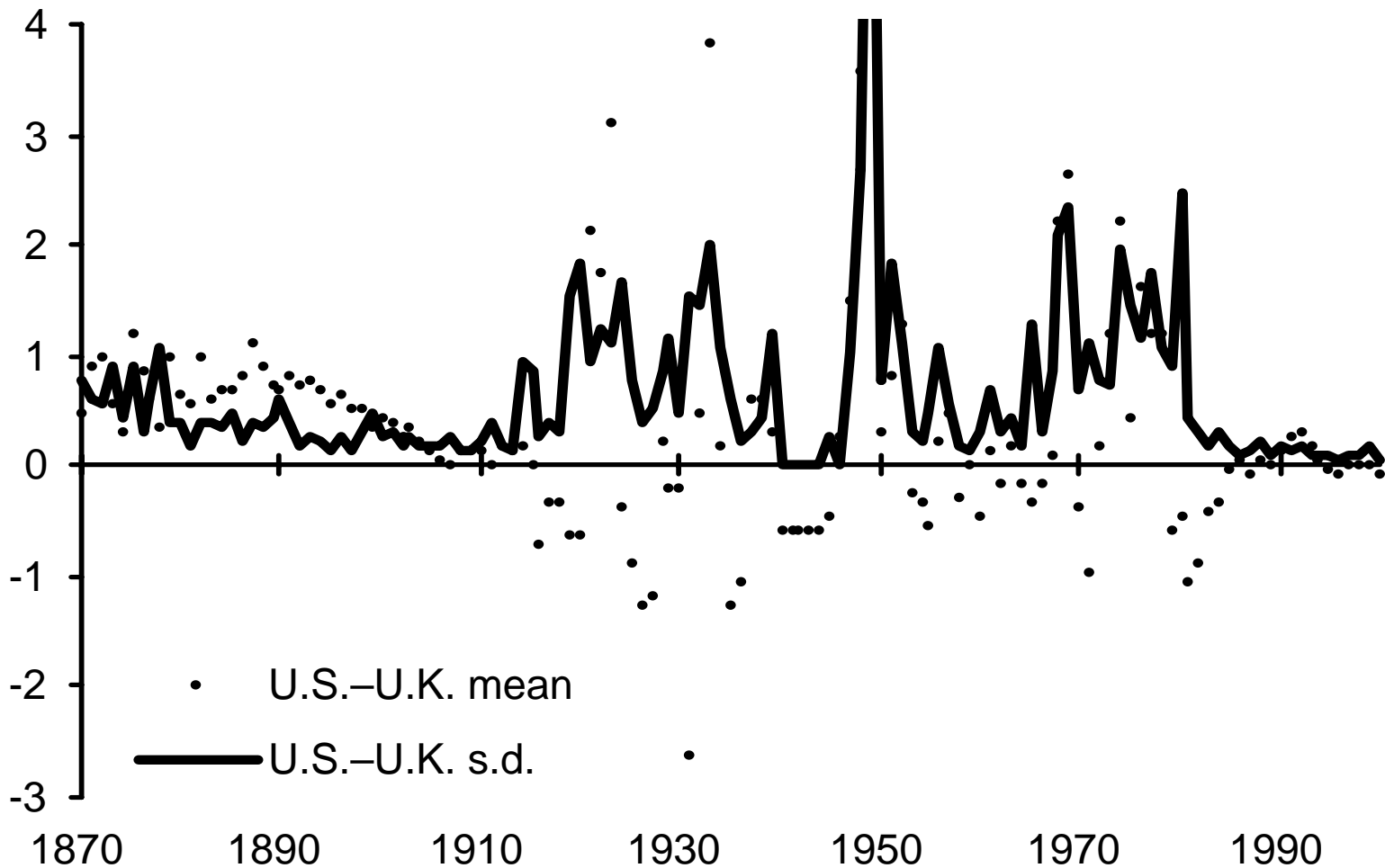- Scenarios for global adjustment: current controversies
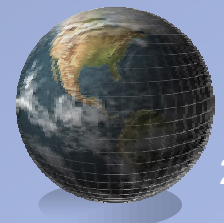
Long-run trends in financial integration

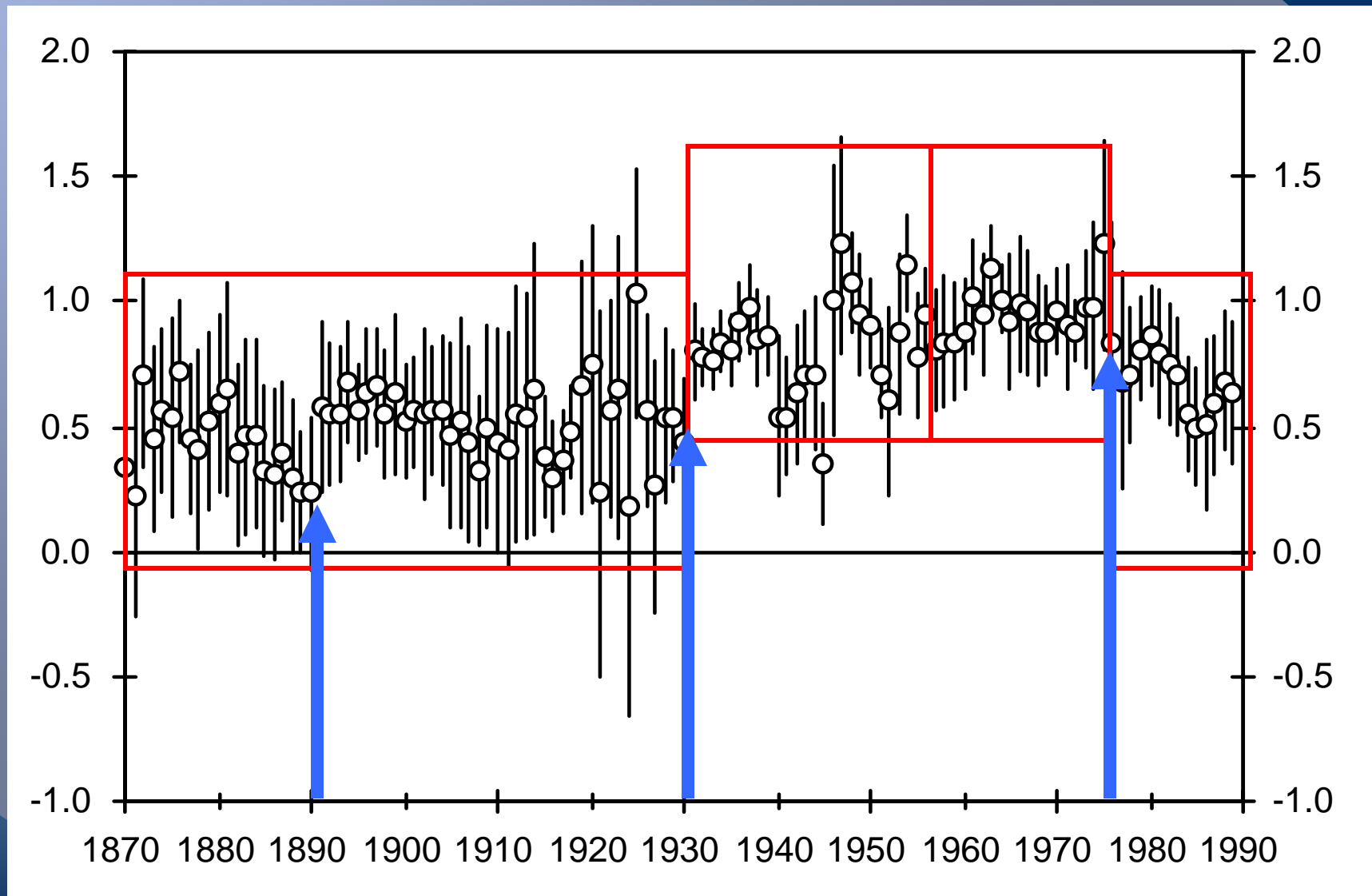- Stylized facts (ca. 1860-2000):
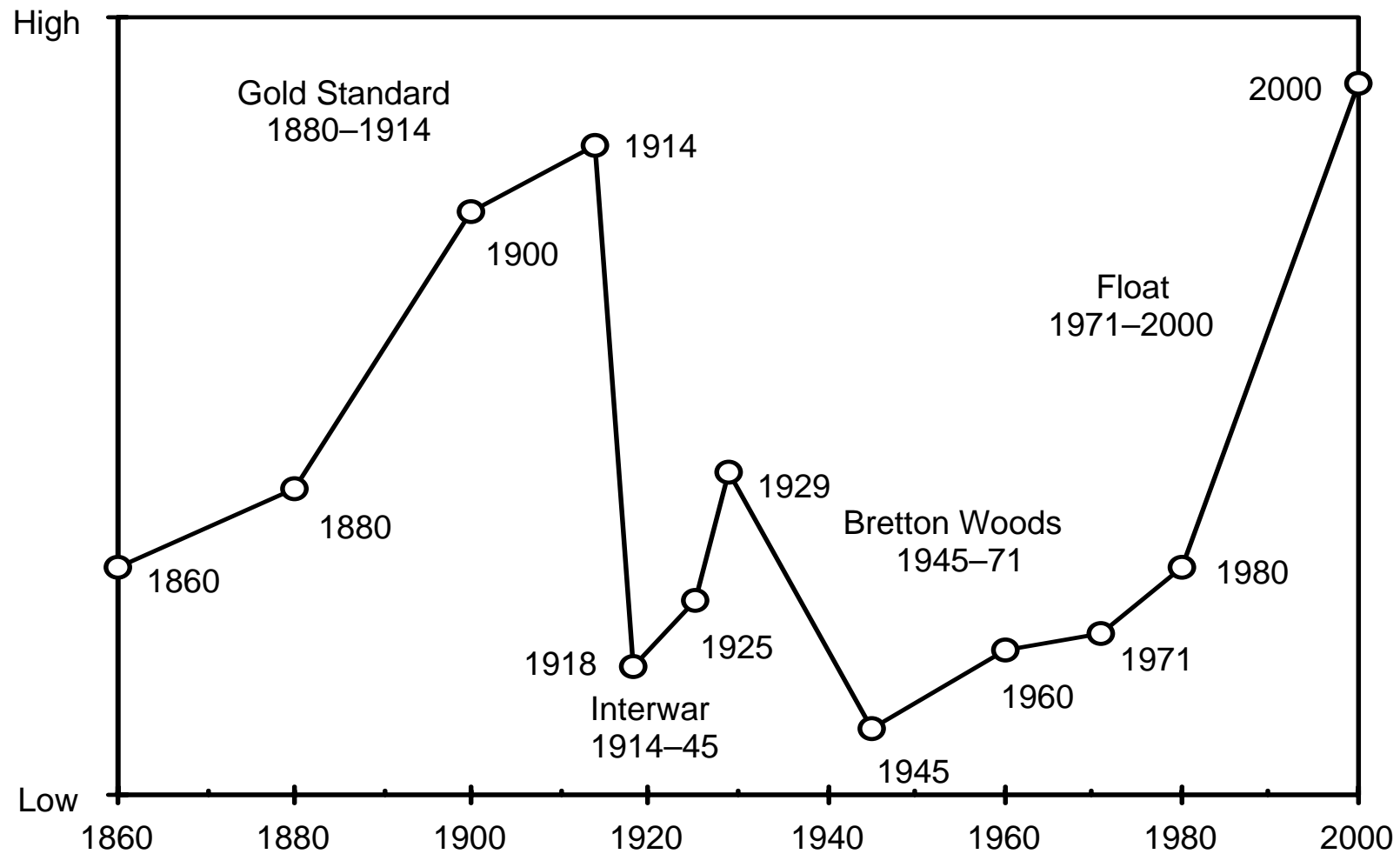
Concrete price and quantity metrics
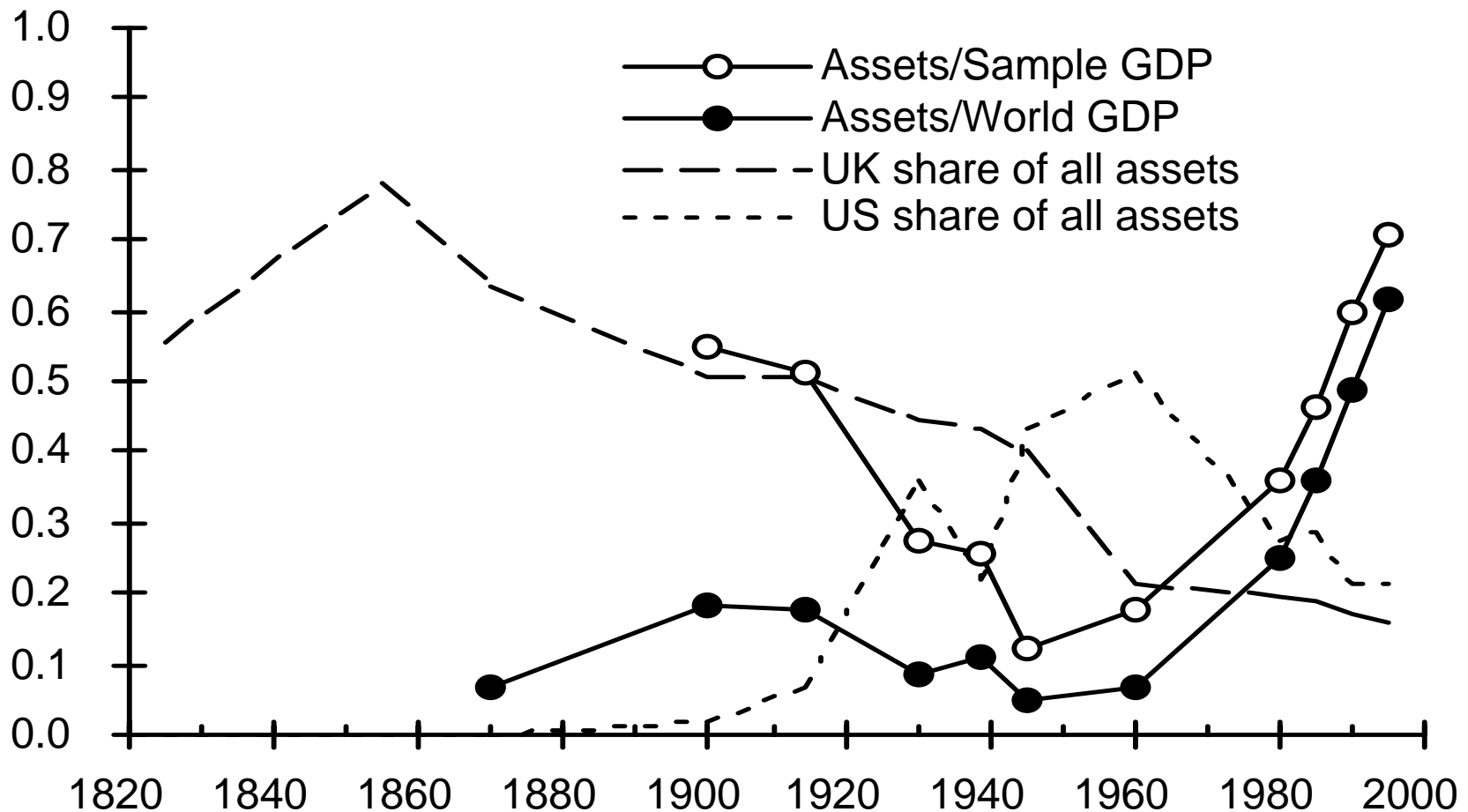- Deviations from covered interest parity

Concrete price and quantity metrics
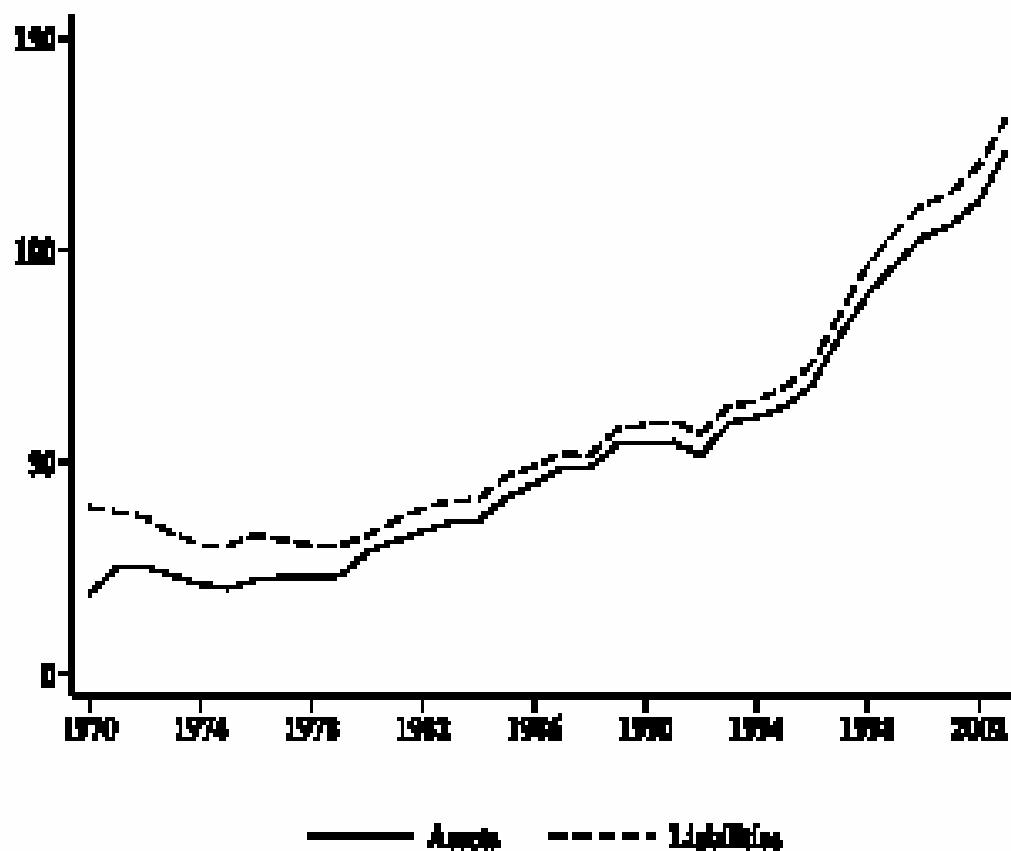- Feldstein-Horioka coefficients

Concrete price and quantity metrics
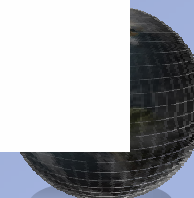
- Gross foreign asset positions

World total foreign assets and liabilities, 1970-2003

World Foreign Assets and Liabilities, 1970–2003 (percent of world GDP)

Source: Philip Lane and Gian Maria Milesi-Ferretti, unpublished data.

# Framework for understanding these changes

- Open economies face a *trilemma*. Can only pick 2 from 3 below (i.e., must drop one):

  Fixed exchange rate
  Open capital market
  Monetary policy autonomy

Historically, political economy has led to some very different outcomes. Four major epochs:

  Gold Standard (1870–1914)
  Interwar (1914–1945)
  Bretton Woods (1945–73)
  Post-Bretton Woods (1973–)
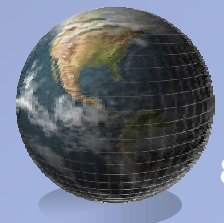
Two-way diversification in the 21st century

- Massive 2-way diversification differentiates the current from the earlier period of globalized capital markets.
- In the 19th century, most flows were "development" rather than "diversification" flows.
- This phenomenon finds one expression in the fact that today, most capital flows from rich to other rich countries.
- In the 19th century, there was a relatively greater flow from rich to poorer.

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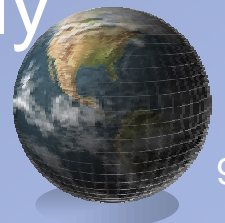
Foreign assets, then and now
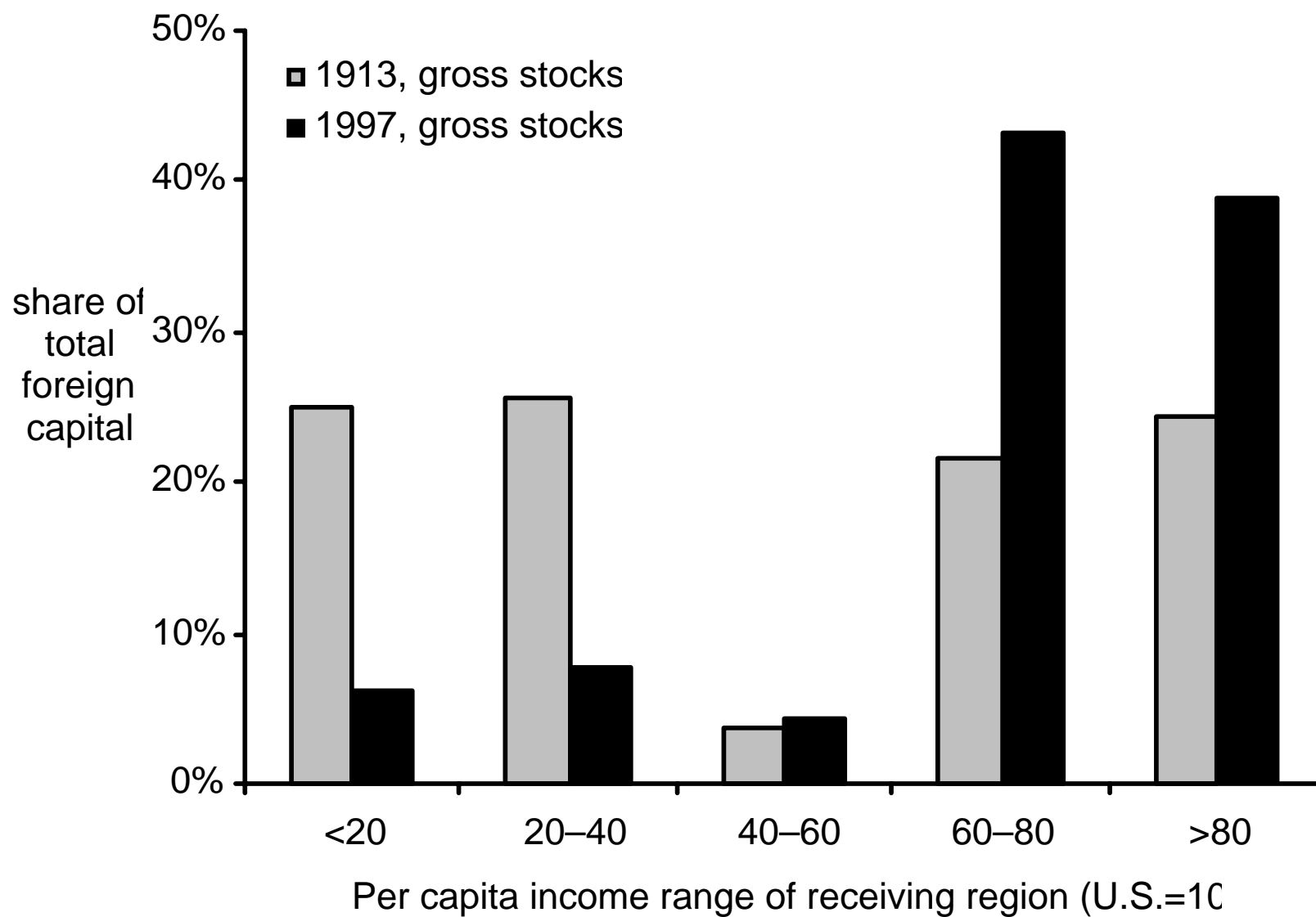
Rich-poor capital flows: Why so limited?

- Modern theories of per capita GDP focus on the role of institutions (North, Engerman-Sokoloff, Acemoglu et al.; but see Glaeser et al.)

- AJR distinguish between colonization based on settlement versus "extractive" models.

- Nurkse, *EJ* (1954), "International Investment Today in the Light of 19th Century Experience" distinguishes between capital flows based on movement of people (complementary factor) and "extractive" investments. He foresaw neither playing a big role in postwar world.

- He was mainly right, but missed rich-rich flows.
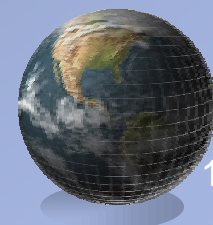
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Developing countries diversify less

- Define the "Grubel-Lloyd" index of diversification asset trade as

$$GL = 1 - \frac{|A - L|}{A + L}.$$

- For $A = L$, index = 1, pure trade across different random states of nature.
- For $A = 0$, index = 0, pure intertemporal asset trade (trade across different dates).

Empirical Grubel-Lloyd indexes, 2003

Indexes of International Asset Trade, 2003

| Country	G–L index	Nonreserve G–L index	Asset trade to GDP	Country	G–L index	Nonreserve G–L index	Asset trade to GDP
High-income countries				*Emerging countries*			
Australia	0.66	0.62	1.02	Argentina	0.70	0.64	1.15
Austria	0.93	0.92	1.63	Bolivia	0.34	0.26	0.84
Belgium	0.95	0.96	3.35	Brazil	0.45	0.31	0.59
Canada	0.99	0.99	0.94	Chile	0.84	0.71	1.14
Denmark	0.96	0.91	1.95	China, P.R.	0.98	0.51	0.46
Finland	0.92	0.90	1.75	Colombia	0.68	0.51	0.58
France	0.98	0.98	1.68	Czech Republic	0.83	0.55	0.83
Germany	0.97	0.98	1.44	Ecuador	0.19	0.14	0.60
Greece	0.64	0.62	0.81	Egypt, Arab Rep.	0.85	0.64	0.55
Hong Kong, China	0.77	0.82	5.90	Guatemala	0.77	0.53	0.36
Iceland	0.58	0.54	1.02	Hungary	0.50	0.33	0.76
Ireland	0.93	0.93	8.49	India	0.75	0.17	0.27
Italy	0.96	0.95	1.06	Indonesia	0.54	0.27	0.53
Japan	0.71	0.81	0.65	Korea, Rep.	0.97	0.59	0.47
Kuwait	0.23	0.25	1.64	Malaysia	0.92	0.63	1.03
Luxembourg	0.99	0.99	78.39	Mexico	0.38	0.15	0.38
Netherlands	0.99	0.98	3.79	Morocco	0.62	0.17	0.57
New Zealand	0.51	0.45	0.84	Pakistan	0.58	0.25	0.40
Norway	0.85	0.88	1.50	Peru	0.49	0.24	0.59
Portugal	0.85	0.83	1.99	Philippines	0.57	0.38	0.71
Singapore	0.89	0.98	4.08	Poland	0.58	0.30	0.48
Spain	0.84	0.83	1.40	South Africa	0.88	0.85	0.59
Sweden	0.95	0.93	1.82	Thailand	0.73	0.34	0.64
Switzerland	0.85	0.87	4.89	Uruguay	0.90	0.86	0.93
United Kingdom	0.99	0.99	3.55				
United States	0.85	0.84	0.83	*Simple average*	0.67	0.43	0.64
Simple average	0.84	0.84	5.25				
Average without Luxembourg	0.83	0.83	2.32				

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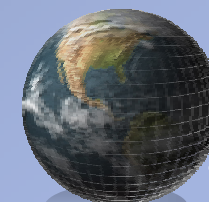
Current global imbalances

- IMF (4/06) forecast of U.S. 2006 current account balance: -$864.2 billion (-6.5% GDP).
- Euro zone: -$23.8 billion (-0.2% GDP)
- Japan: +$163.9 billion (3.2% GDP)
- Other advanced: +$145.1 billion
- Newly indust. Asia: +$88.6 billion (5.7% GDP)
- Other developing: +$486.7 billion
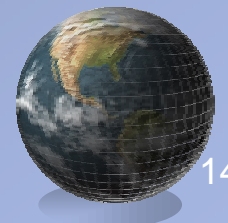
2005 saving-investment balances (% GDP)
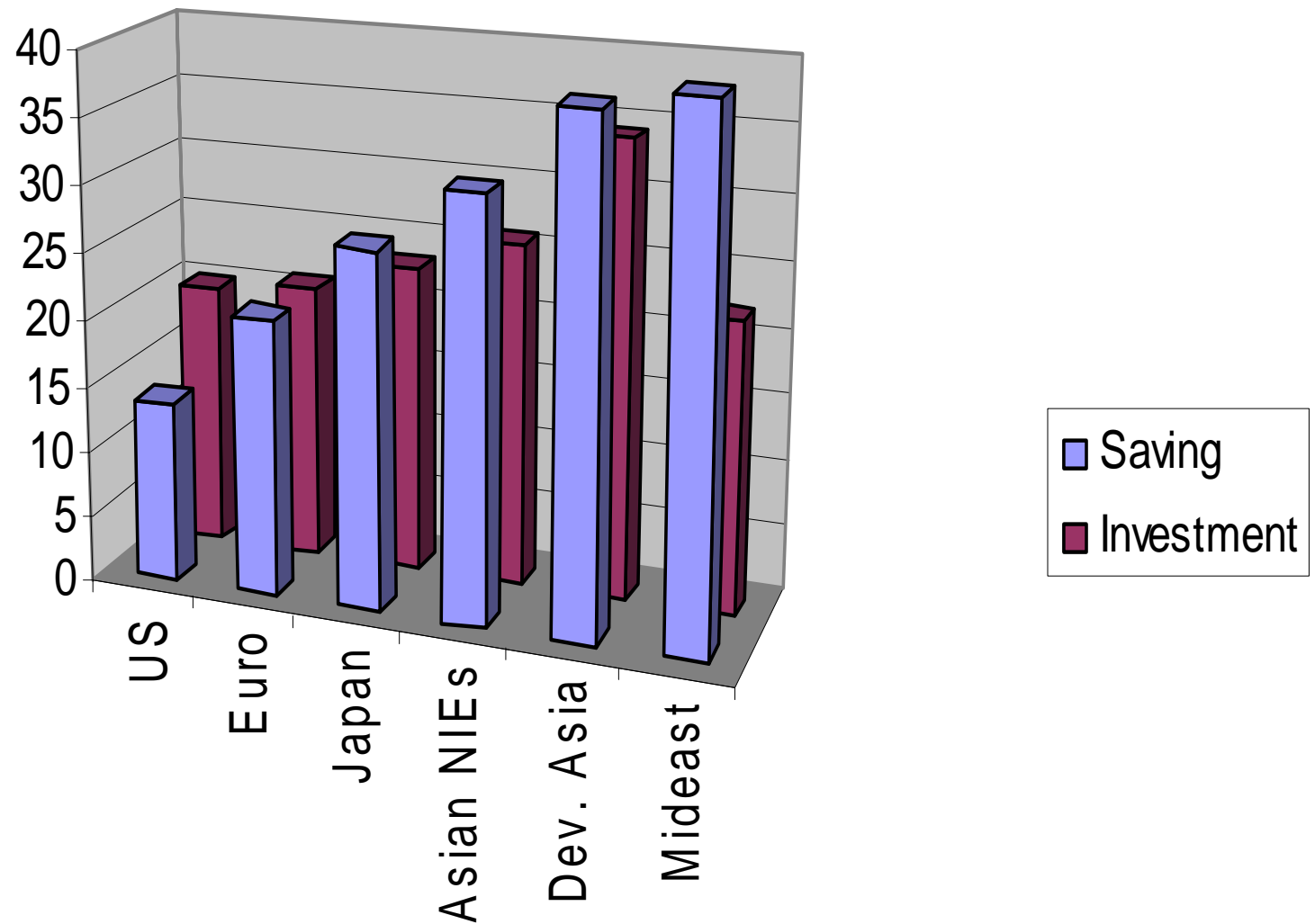
# U.S Current Account Balance: 1970-2005
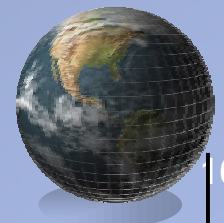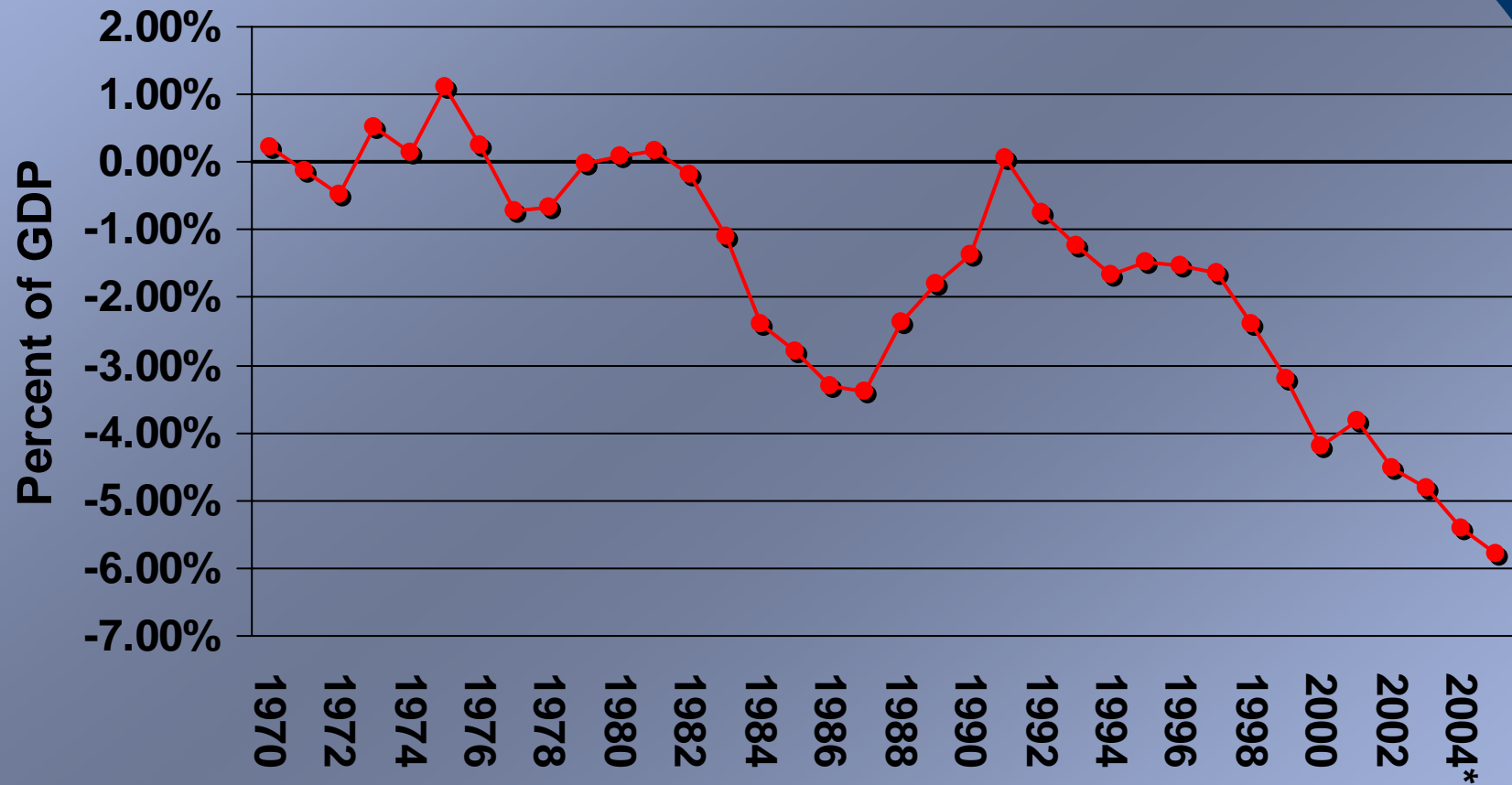
Net foreign asset changes versus current account balances: role of exchange rates

- *CA* data based on NIPA. Excludes capital gains and losses on net foreign assets.
- Change in *NFA* = *CA* + net capital gains on lagged *NFA.*
- Capital gains/losses due to (i) asset price changes (e.g., stock-market movements) and (ii) exchange rate changes.
- These can now be **very** large. Cf. Lane and Milesi-Ferretti; Tille; Gourinchas and Rey
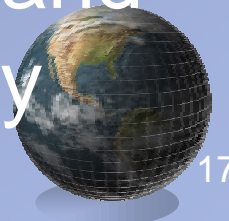
Numerical example

- Right now, U.S. net external debt 25% GDP.
- Gross foreign assets = 75% U.S. GDP.
- Gross foreign liabilities = 100% U.S. GDP.
- About 65% of U.S. assets in foreign currencies.
- About 95% of U.S. liabilities in dollars.
- Effect of a 1% balanced dollar depreciation: $(.01)(.65)(.75) - (.01)(.05)(1) = .4375\%$ GDP, or about $50 billion transfer to the U.S.
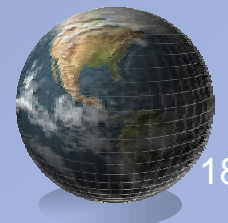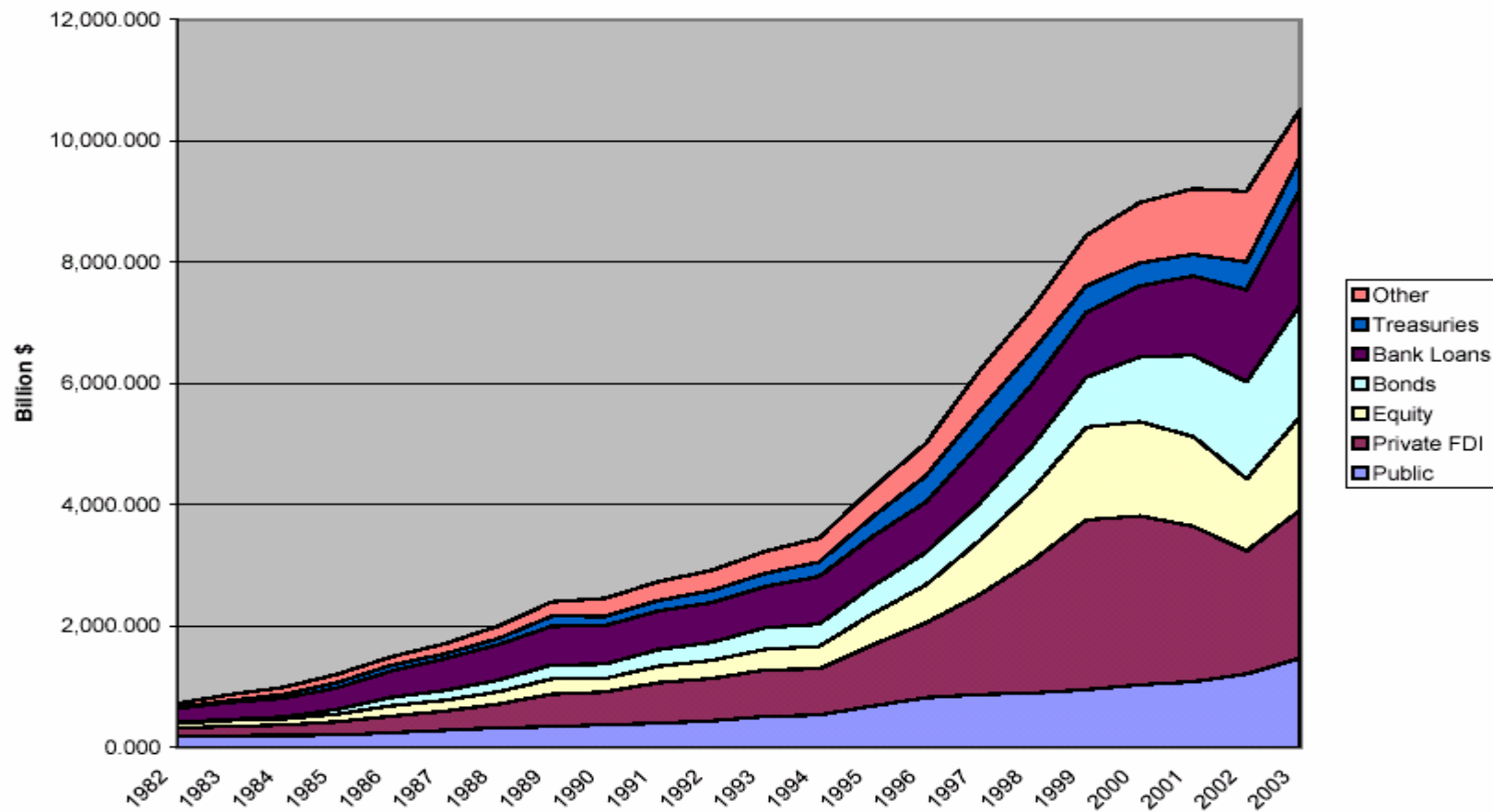
Composition of U.S. external position
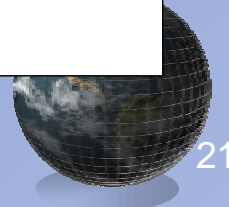

Composition of U.S. Gross Foreign Assets
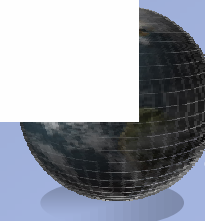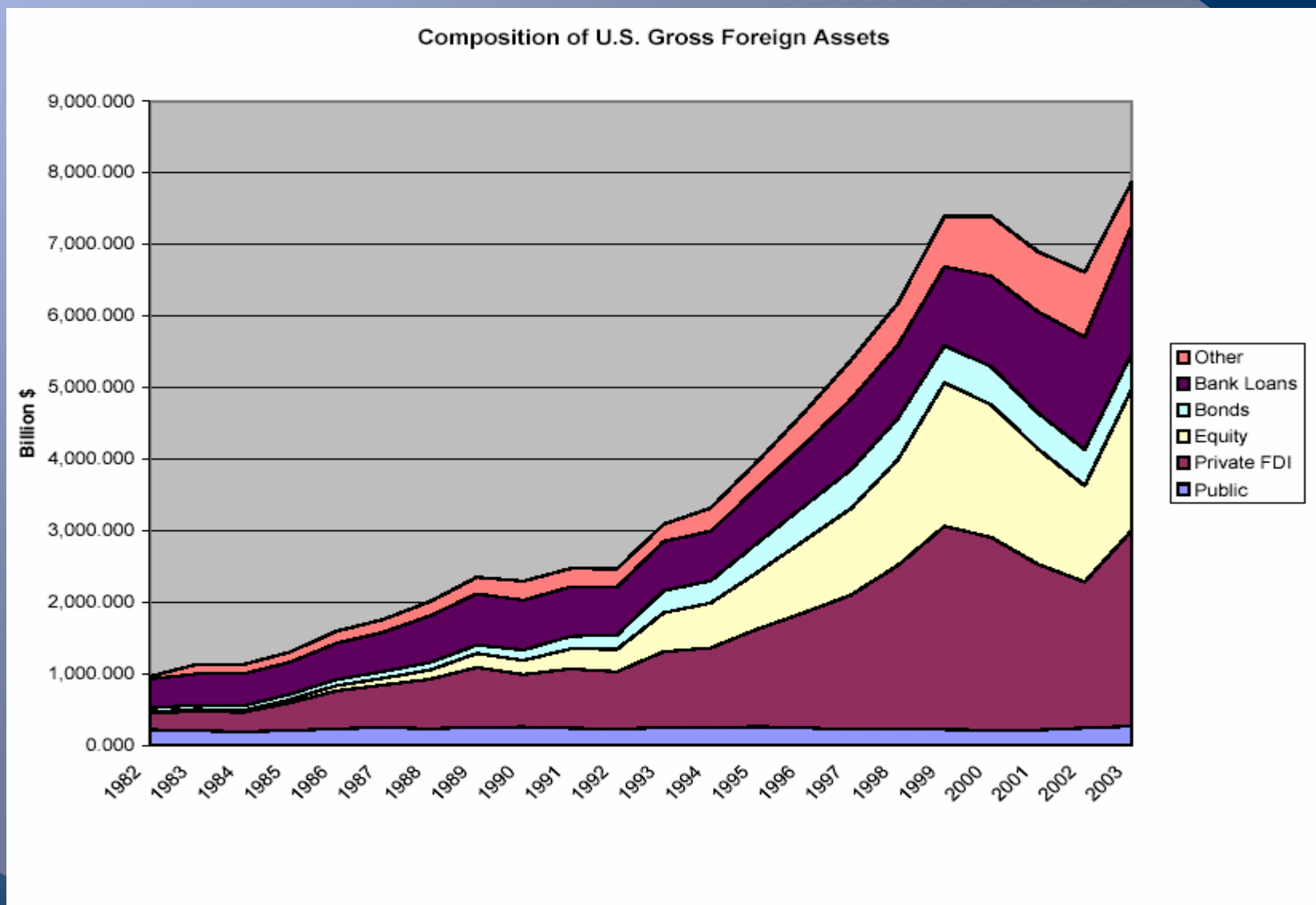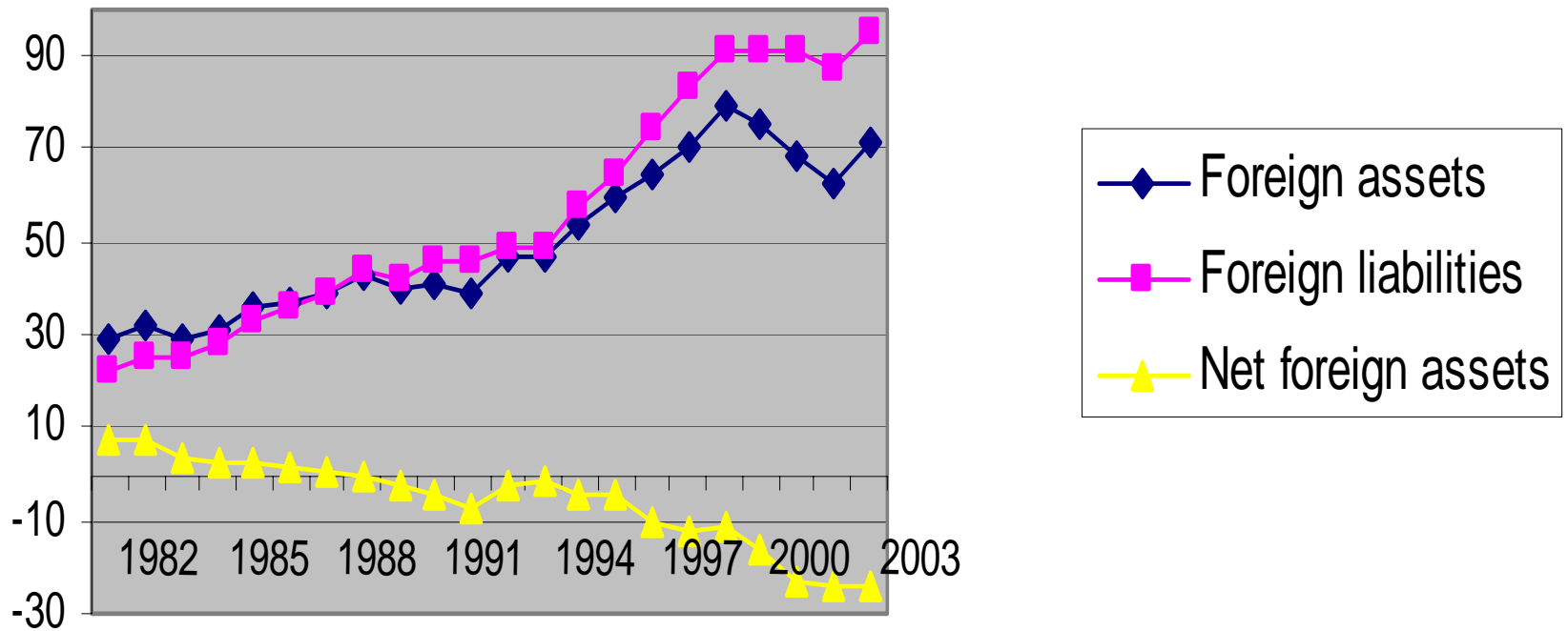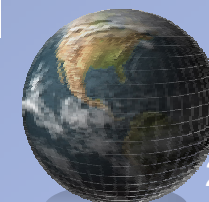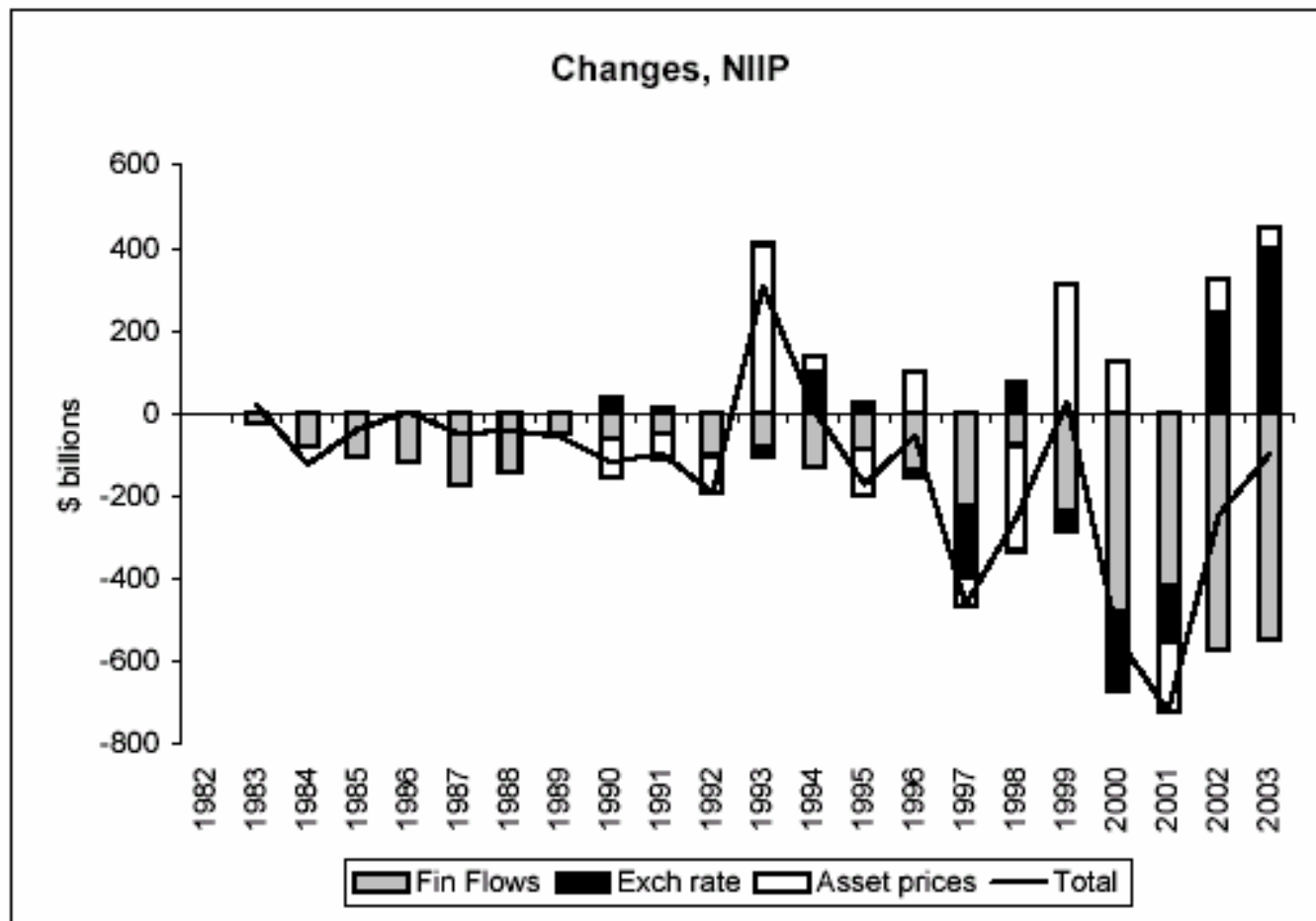
Composition of U.S. external position

Composition of U.S. Gross Foreign Liabilities

United States Foreign Assets, Liabilities, and Net Foreign Assets, 1982-2003 (percent of GDP)

CA vs. capital gains in dynamics of *NFA*

Changes, NIIP

Net Excess Return on the U.S. International Portfolio, 1983-2003 (billions of dollars)

Annual averages: 3.1%(total), 1.2%(income)
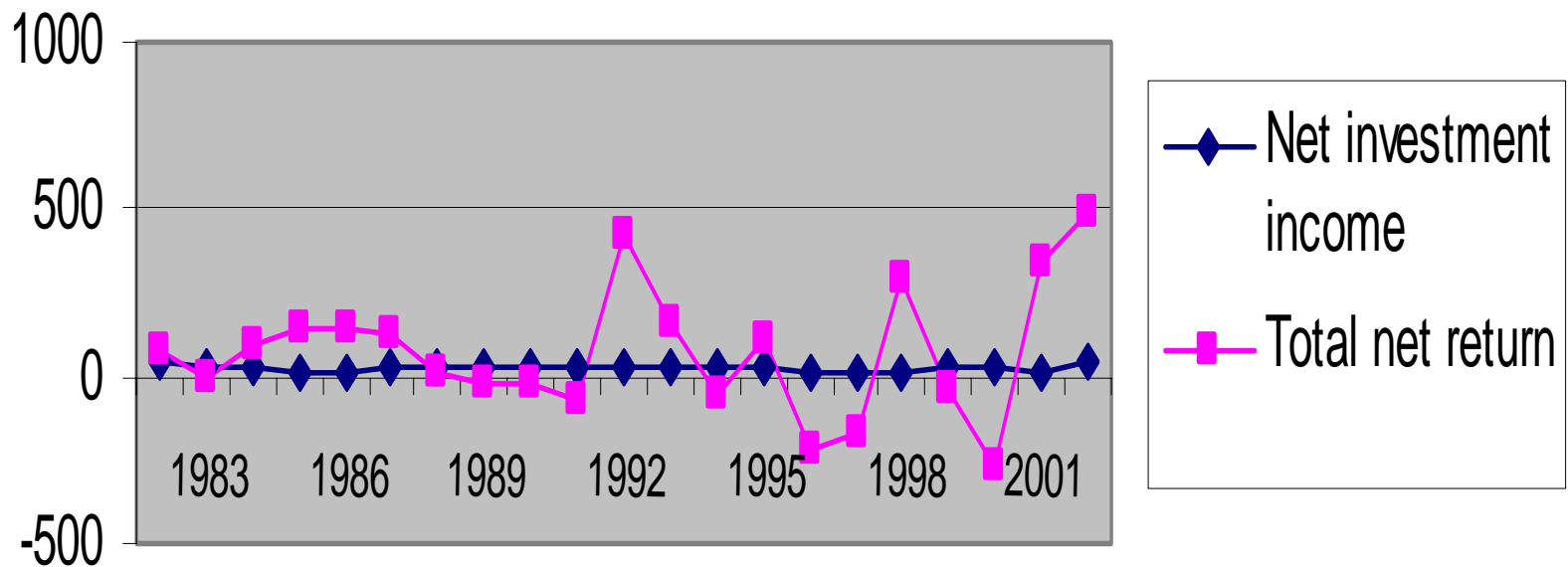
Empirics and theories of adjustment

- Paper by P.-O. Gourinchas and H. Rey, "International Financial Adjustment," NBER Working Paper 11155, February 2005.
- Key idea: Intertemporal budget constraint of a country links increase in net foreign debt to either (or both of)
    - (i) increase in present value of future trade surpluses
    - (ii) increase in present value of future capital gains on the leveraged international portfolio.
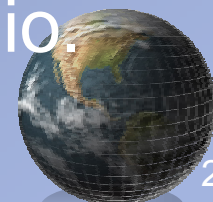
Gourinchas-Rey main findings:

- Over 31% of stabilizing U.S. external adjustment comes through capital gains/losses.

- Deviations from trend in the ratio NX/NFA predicts asset returns 1 quarter to 2 years ahead and NX at longer horizons.

- Exchange-rate change is forecastable by NX/NFA out of sample, one quarter out and beyond (compare Meese-Rogoff result).

- IMF, *WEO*, April 2005: Related results for some industrial countries, most strongly U.S.
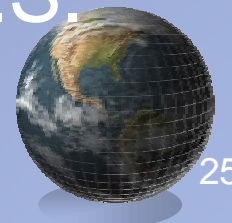
U.S. current account and the dollar
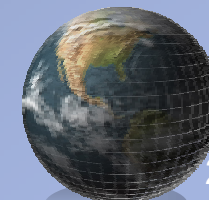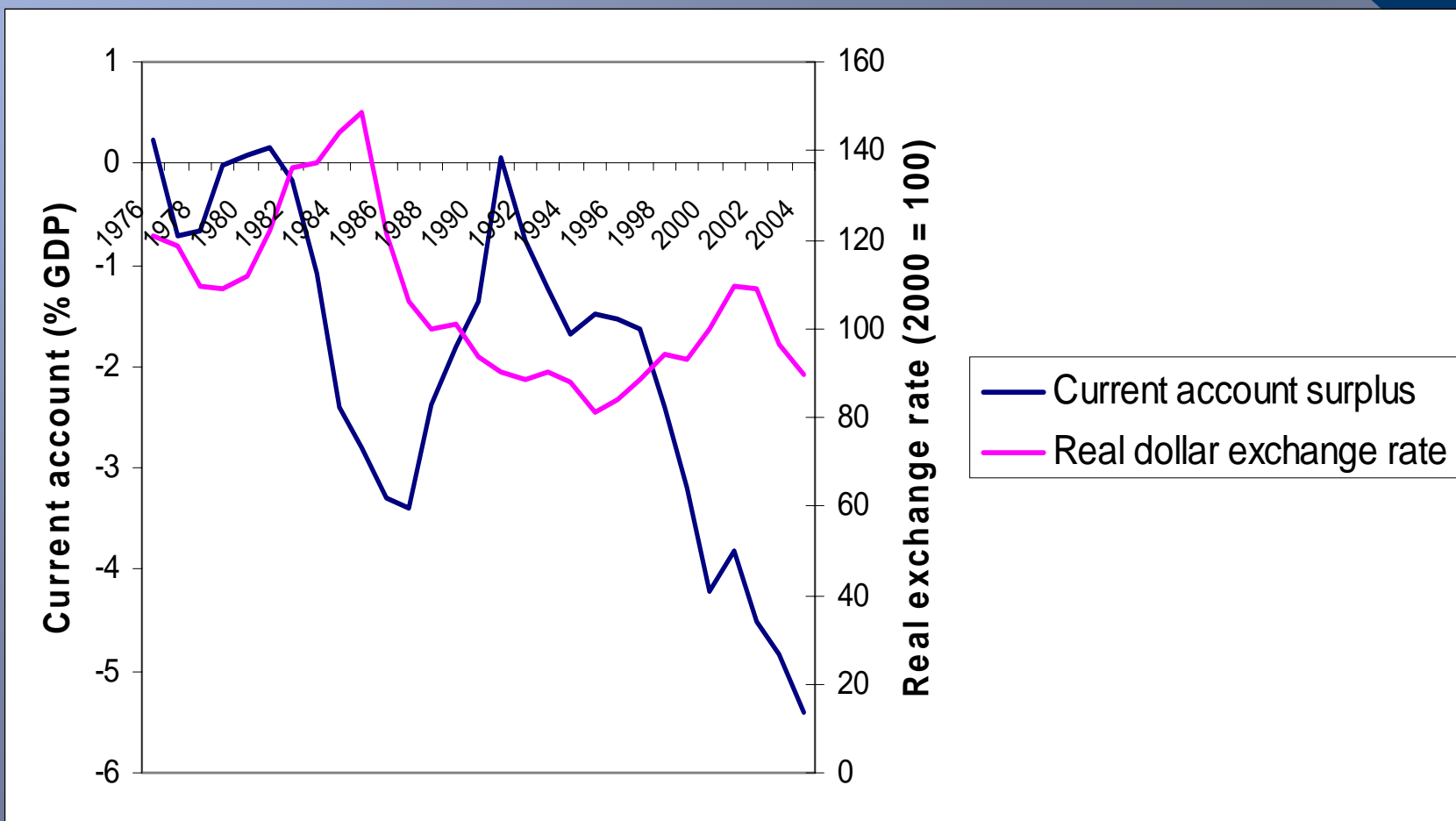
What economic mechanisms are at work?

- Home bias in consumption preferences
  - Gives rise to Keynesian "transfer" mechanism, whereby a transfer of wealth to U.S. improves terms of trade, appreciates currency.

- Home bias in currency preferences
  - Gives rise to a portfolio transfer effect, as in the classic portfolio-balance model of W. Branson, D. Henderson, P. Kouri and others, in which an inward transfer of wealth creates excess demand for home-currency assets and an appreciation of the home currency.
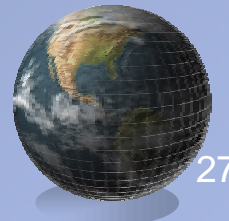
Stabilizing role of depreciation?

- Under portfolio-balance model, country with a deficit will have a depreciating currency.
- If its assets are mainly in foreign currency, liabilities in domestic, this can be stabilizing.
- As home currency depreciates, foreigners lose and demand more, we gain and demand less.
- Flow effect on net foreign assets offset.
- Home currency declines at an *ever-decreasing* rate.
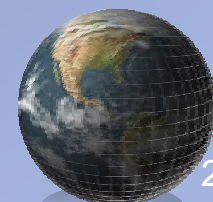
Not for emerging markets!

- Tend to display "original sin."
- As their currencies depreciate in the face of a deficit, negative flow effect on their *NFA* is *reinforced*, not offset.
- Since the "hit" to wealth is all in net dollar holdings, domestic currency must depreciate more sharply, not less.
- Stability under rational expectations, but truly knife-edge.
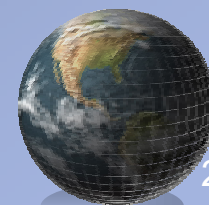
Adjustment dynamics with debt, original sin
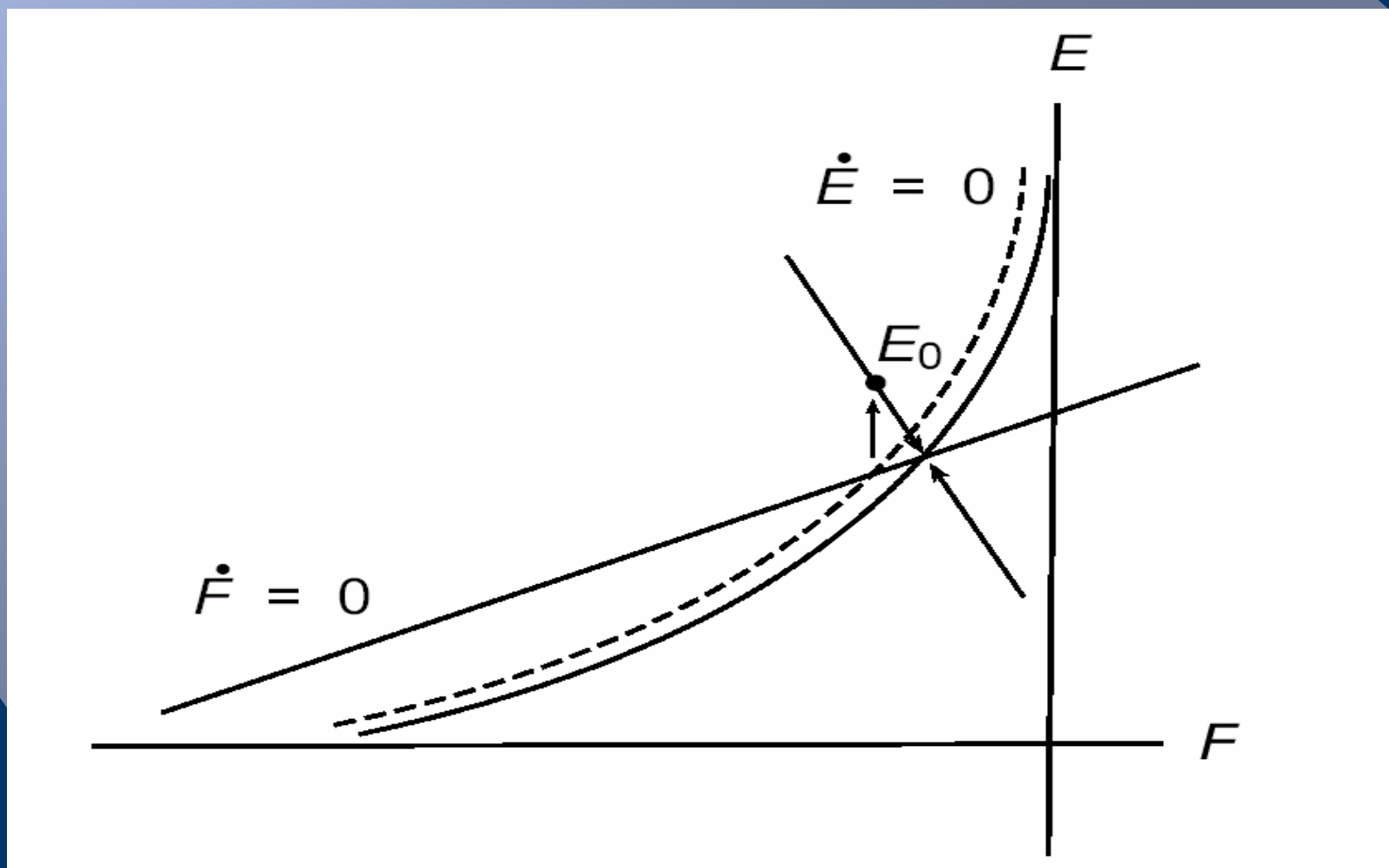
Consistent with WEO findings for emerging markets.

Does the current account still matter?

- One view is that "the current account is a meaningless concept" -- former Treasury Secretary O'Neill.
- Or: the U.S. is the best/only place for the world to invest (Laffer, Cooper, many others).
- Or: increasing integration of asset markets makes adjustment easier (Greenspan).
- Or: Asia will finance us forever (Dooley et al.)
- Or: excessive global saving is to blame.
- Or: complete markets.
- Or: valuation effects can do the work.

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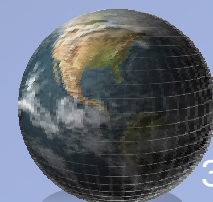
These views, I would argue, are *wrong*

- In '90s U.S. deficit reflected high investment -- bubble collapse helped *NFA* (a bit).
- Now *CA* reflects high government deficit.
- For government deficit to have had no role, consumers must be very Ricardian -- they must have *raised* saving massively. But U.S. saving rate is lowest in industrial world now.
- Fed study on how deficit reduction affects *CA*: assumes fairly low trade elasticities.
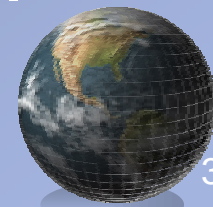
U.S. Current Account and Saving-Investment

(percent of GDP)

Private Saving - Investment

Private Investment Left Axis

Public Saving - Investment

Current Account Balance

70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04

33
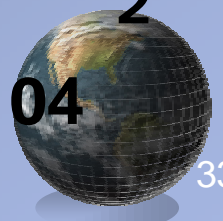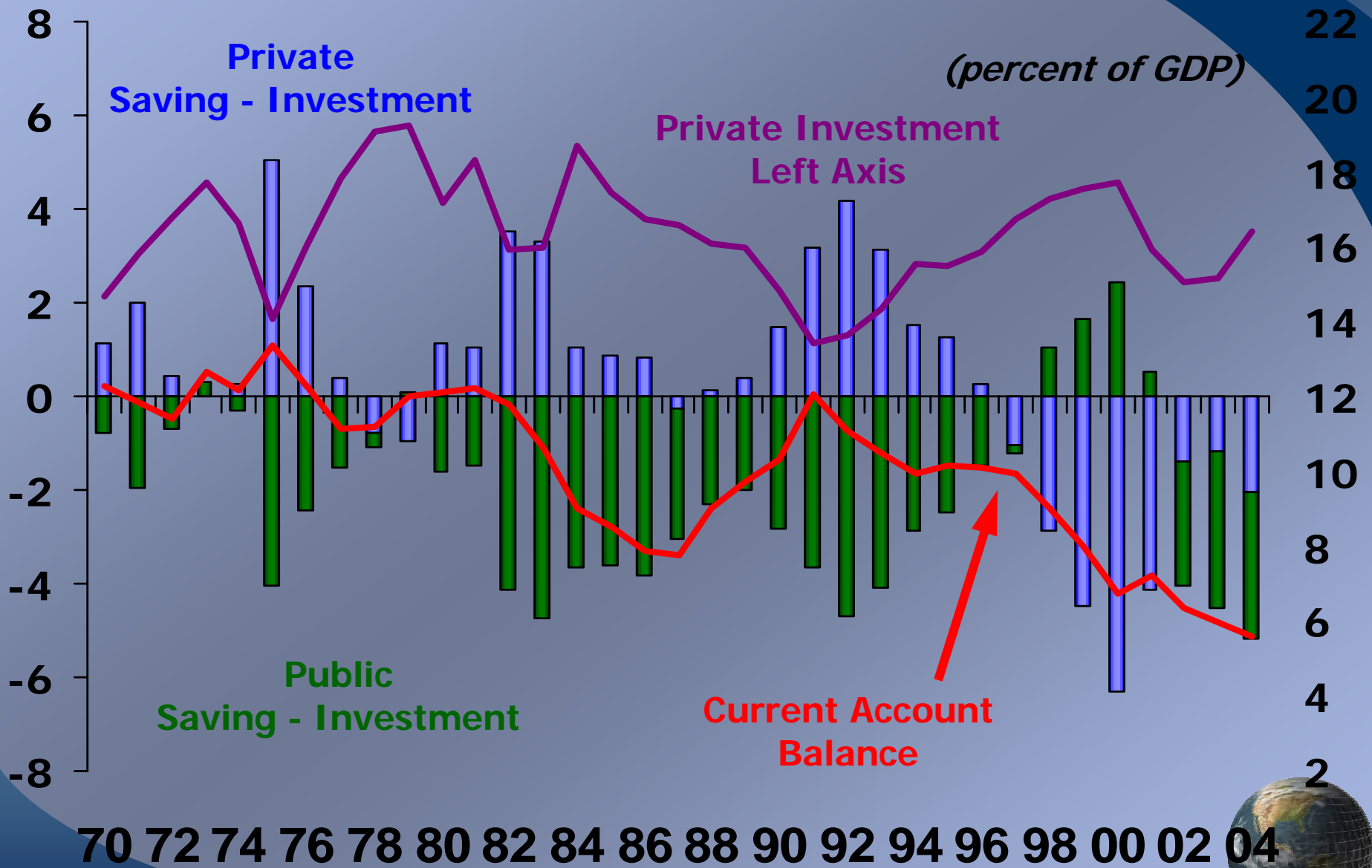
Is foreign asset demand driving the deficit?

- As a matter of accounting, foreigners can add U.S. assets to their portfolios even if $CA = 0$.

- In 2004, they added $1.078 trillion (BEA), much more than the net deficit of $666 billion.

- So CA deficit not yet testing foreign willingness to add U.S. assets to portfolios?

- Foreign asset demand could raise our CA deficit by appreciating the currency, lowering interest rate. How powerful are these portfolio effects?
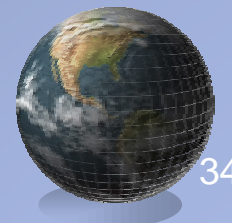
The Deutsche Bank *Weltanschaung*

- "Bretton Woods II" worldview: Asia needs a dollar peg to grow, eliminate surplus labor.

- They also need FDI for those purposes.

- Since they need an export surplus for growth, massive reserve accumulation follows.

- U.S. interest rates are kept low, USD high (though not against euro).

- Chinese controls can support this indefinitely.

- Problem: Applies to China, but Japan, Korea?

- Eventual inflow attacks? Reserve losses?
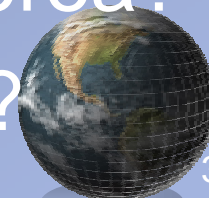
World saving and investment (2005)

- Investment in Asian NIEs and Japan very low.

- Their saving is far *below* 1992-99 levels.

- Developing Asia invests and saves more than in '90s.

- Middle East: As in mid-1970s, oil surplus pushes world interest rate down.

Legend:
- '92-'99 Investment
- Investment
- Saving

Categories: US, Euro, Japan, NIEs, Dev. Asia, Mideast
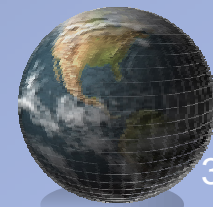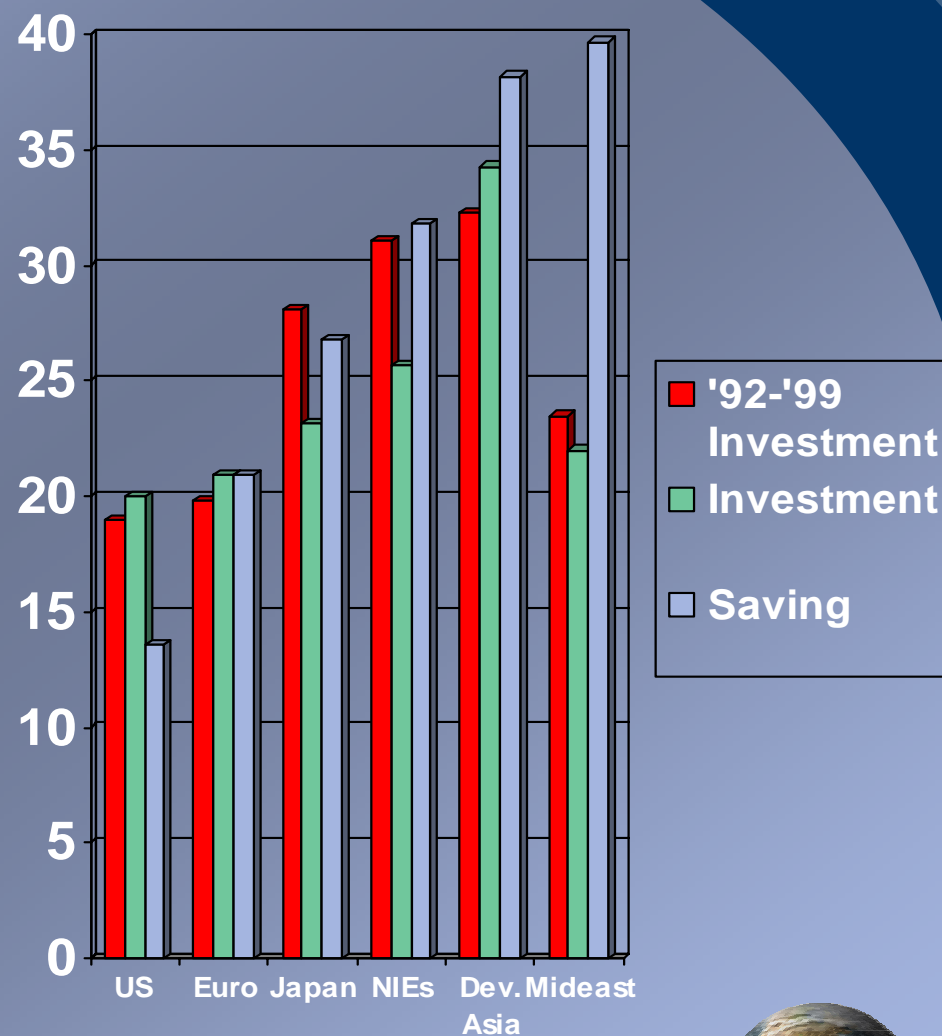
Currency mismatch: Menu for policy choice?

- Asset flow is better understood than asset returns, and easier to act upon by policy.

- If we run policies on the theory that we can under-compensate foreign investors all of the time, they are likely to demand higher interest on loans.

- Asian official creditors clearly are worried about the dollar.
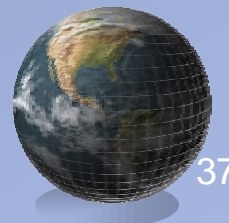
Scenarios for U.S., global adjustment

- If we take it as given that U.S. external adjustment must eventually come, its consequences are important.

- They arise primarily from the need to re-equilibrate markets in the face of a large shift in world spending patterns.

- The degree of asset-market globalization is less important for the resulting exchange rate effects than goods-market globalization, which remains limited.

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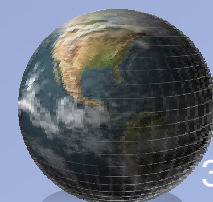
U.S. Dollar Real Exchange Rate
Broad Index, March 1973 = 100
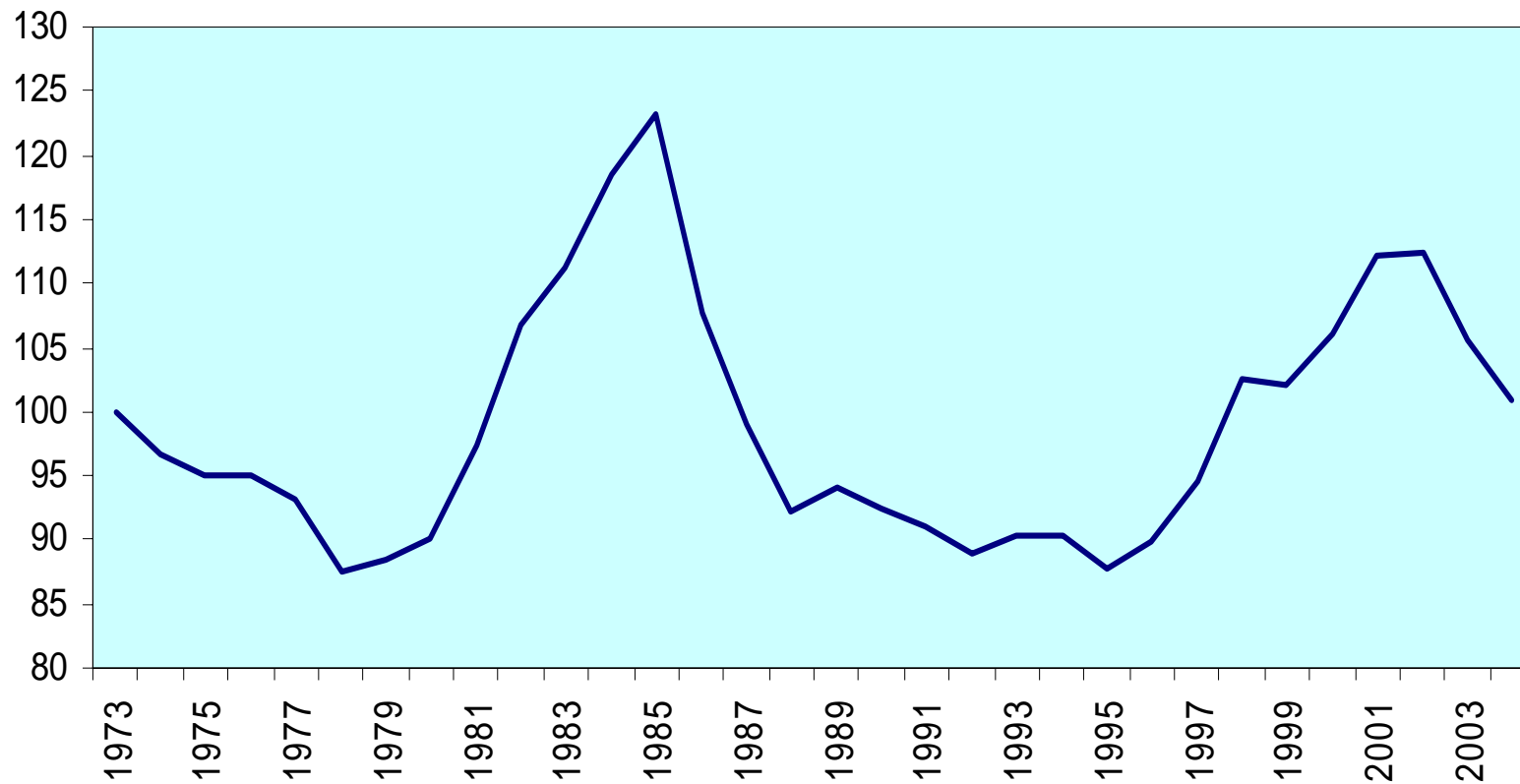
Source: Board of Governors of the Federal Reserve System
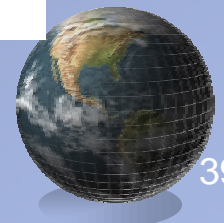
Quantitative effects

- Rogoff and I (*BPEA* 1: 2005) suggest a three-region model: U.S., Europe, Asia.

- In each region people consume two aggregates, nontradables and tradables made up of the home export plus imports from the two other regions.

- There is *home consumption bias* in traded goods, such that tradables price levels differ and a Keynesian *transfer effect* operates.

- But the overall real exchange rate depends on relative nontradeds' prices too.

Consumption baskets

$$C^i = \left[\gamma^{\frac{1}{\theta}} \left(C_T^i \right)^{\frac{\theta-1}{\theta}} + (1-\gamma)^{\frac{1}{\theta}} \left(C_N^i \right)^{\frac{\theta-1}{\theta}} \right]^{\frac{\theta}{\theta-1}}, i = U, E, A,$$
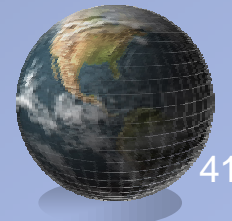
$$C_T^U = \left[\alpha^{\frac{1}{\eta}} \left(C_U^U \right)^{\frac{\eta-1}{\eta}} + (\beta-\alpha)^{\frac{1}{\eta}} \left(C_E^U \right)^{\frac{\eta-1}{\eta}} + (1-\beta)^{\frac{1}{\eta}} \left(C_A^U \right)^{\frac{\eta-1}{\eta}} \right]^{\frac{\eta}{\eta-1}},$$

$$C_T^E = \left[\alpha^{\frac{1}{\eta}} \left(C_E^E \right)^{\frac{\eta-1}{\eta}} + (\beta-\alpha)^{\frac{1}{\eta}} \left(C_U^E \right)^{\frac{\eta-1}{\eta}} + (1-\beta)^{\frac{1}{\eta}} \left(C_A^E \right)^{\frac{\eta-1}{\eta}} \right]^{\frac{\eta}{\eta-1}},$$

$$C_T^A = \left[\delta^{\frac{1}{\eta}} \left(C_A^A \right)^{\frac{\eta-1}{\eta}} + \left(\frac{1-\delta}{2} \right)^{\frac{1}{\eta}} \left(C_E^A \right)^{\frac{\eta-1}{\eta}} + \left(\frac{1-\delta}{2} \right)^{\frac{1}{\eta}} \left(C_U^A \right)^{\frac{\eta-1}{\eta}} \right]^{\frac{\eta}{\eta-1}}.$$

Price indexes

$$P_j^i \equiv \text{country } i \text{ exact price index for consumption category } j.$$

$$P_C^i = \left[\gamma \left(P_T^i \right)^{1-\theta} + (1-\gamma) \left(P_N^i \right)^{1-\theta} \right]^{\frac{1}{1-\theta}}, i = U, E, A,$$

$$P_T^U = \left[\alpha P_U^{1-\eta} + (\beta - \alpha) P_E^{1-\eta} + (1-\beta) P_A^{1-\eta} \right]^{\frac{1}{1-\eta}},$$

$$P_T^E = \left[\alpha P_E^{1-\eta} + (\beta - \alpha) P_U^{1-\eta} + (1-\beta) P_A^{1-\eta} \right]^{\frac{1}{1-\eta}},$$

$$P_T^A = \left[\delta P_A^{1-\eta} + \left(\frac{1-\delta}{2} \right) P_U^{1-\eta} + \left(\frac{1-\delta}{2} \right) P_E^{1-\eta} \right]^{\frac{1}{1-\eta}}.$$
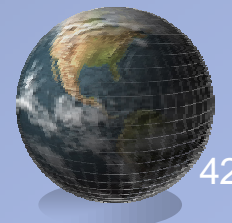
Terms of trade, real exchange rates

$$\tau_{U,E} = \frac{P_E}{P_U}, \quad \tau_{U,A} = \frac{P_A}{P_U}, \quad \tau_{E,A} = \frac{P_A}{P_E} = \frac{\tau_{U,A}}{\tau_{U,E}}.$$

$$q_{U,E} = \frac{P_C^E}{P_C^U}, \quad q_{U,A} = \frac{P_C^A}{P_C^U}, \quad q_{E,A} = \frac{P_C^A}{P_C^E} = \frac{q_{U,A}}{q_{U,E}}.$$
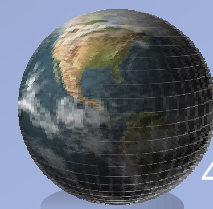
Changes in relative tradables indexes

$$\hat{P}_T^E - \hat{P}_T^U = (2\alpha - \beta)\hat{\tau}_{U,E}.$$

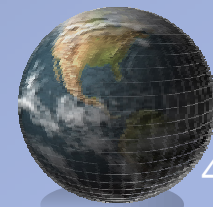$$\hat{P}_T^A - \hat{P}_T^U = [\delta - (1-\beta)]\hat{\tau}_{U,A} + \left[\left(\frac{1-\delta}{2} - (\beta-\alpha)\right)\right]\hat{\tau}_{U,E}.$$

Changes in real exchange rates

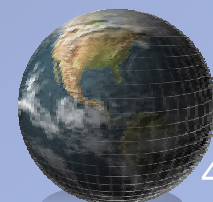$$\hat{q}_{U,E} = \lambda(2\alpha - \beta)\hat{\tau}_{U,E} + (1-\lambda)(\hat{P}_N^A - \hat{P}_N^U).$$

$$\hat{q}_{U,A} = \gamma[\delta - (1-\beta)]\hat{\tau}_{U,A} + \gamma\left[\left(\frac{1-\delta}{2} - (\beta - \alpha)\right)\right]\hat{\tau}_{U,E} + (1-\gamma)(\hat{P}_N^A - \hat{P}_N^U).$$

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Current account adjustment

- We know that the current accounts of the 3 regions must sum to zero.

- There are various ways in which the U.S. *CA* can go to zero; e.g., everyone does so, Asia maintains its real bilateral peg (which requires Asia to *raise* its surplus -- otherwise it would have to appreciate against the U.S. in real terms), Asia does nothing
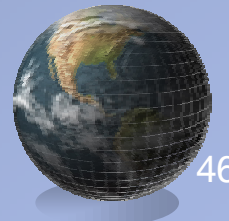
Numerical findings (theta = 1, eta = 2, alpha= 0.7, beta = 0.8, delta = 0.7, gamma =0.25)

CHANGES IN BILATERAL REAL EXCHANGE RATES			
Log change (x 100) in:	GLOBAL REBALANCING: All current accounts go to zero	BRETTON WOODS II: Asia raises CA surplus to keep dollar fix. Europe CA absorbs all change in US and Asia CAs	EUROPE TRADES PLACES: Europe absorbs entire US CA improvement, Asia CA constant
Real exchange rate, $q_{U,E}$ (Europe/US)	28.6	49.5	44.6
Real exchange rate, $q_{U,A}$ (Asia/US)	35.2	–0.5	19.4
Real exchange rate, $q_{E,A}$ (Asia/Europe)	6.7	–50.0	–25.2
Terms of trade, $\tau_{U,E}$ (Europe/US)	14.0	21.5	22.0
Terms of trade, $\tau_{U,A}$ (Asia/US)	14.5	3.4	11.1
Terms of trade, $\tau_{E,A}$ (Asia/Europe)	0.5	–18.0	–10.8

Effects on net foreign investment positions

- Start from a situation in which the ratio of U.S. net liabilities to tradables = -1, Europe = 0, Asia = 1.

| Ratio of Net Foreign Assets to U.S. Tradable Output after Exchange Rate Revaluation Effects		
GLOBAL REBALANCING: All current accounts go to zero	**BRETTON WOODS II:** Asia raises CA surplus to keep dollar fix. Europe CA absorbs all change in US and Asia CAs	**EUROPE TRADES PLACES:** Europe absorbs entire US CA improvement, Asia CA constant
U.S. – 0.3	– 0.2	– 0.2
Euro – 0.1	–0.6	– 0.4
Asia 0.4	0.8	0.6

Hazards

- Greater asset market integration might facilitate gradual adjustment …

- … or give us a longer rope for neckwear.

- The larger is CA deficit and net foreign debt, and thus the "overhang" of potential depreciation, the more likely is an eventual precipitous adjustment.

- Given the greater volume of gross positions than in the past, much nonbank, the risks are great.

- World interest rates due to rise. As a debtor we will be hurt. Could we lose any privilege? This could offset (easily) gains in U.S. *NFA* position.

- For the U.S., fiscal responsibility is the obvious first step to take.

Hazards (continued)

- Krugman paper on "Will There be a Dollar Crisis?" (November 2005)
- Reprises 1985 Jackson Hole analysis
- Argues that market expectations (as embodied in real interest differentials, assuming UIP) underestimate extent of dollar depreciation necessary to avoid unstable/implausible debt dynamics
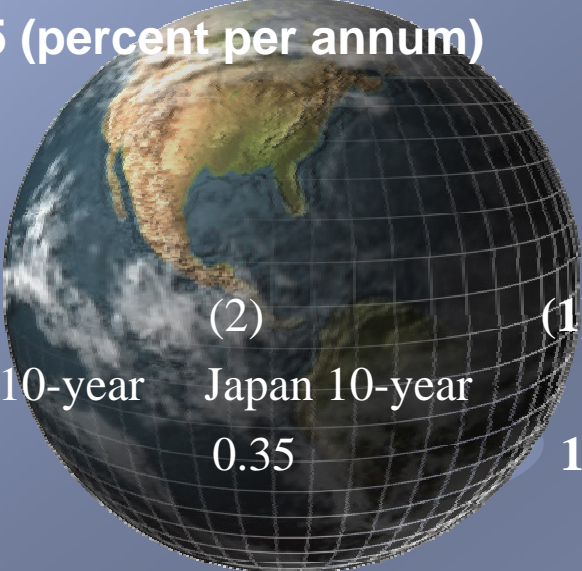- When markets "wake up" to this, there could be a steep dollar collapse
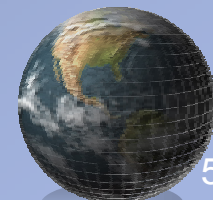
Krugman: A "Wile E. Coyote moment"?
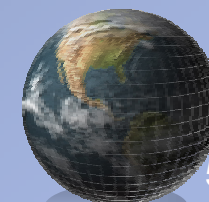
From M. Obstfeld, "America's Deficit, the World's Problem," Bank of Japan, *Monetary and Economic Studies* (October 2005)

Returns and Differentials on Inflation Indexed Government Bonds, June 6, 2005 (percent per annum)

(1)	(2)	**(1) - (2)**	(3)	(4)	**(3) - (4)**
U.S. 10-year	Japan 10-year		U.S. 30-year	France 30-year	
1.57	0.35	**1.22**	1.68	1.56	**0.12**

Source: Global Financial Data, Bloomberg