Macroeconomic and Industry Impacts of Currency Valuation: A Global Modeling Analysis

Jeff Werling
INFORUM
University of Maryland
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Overview

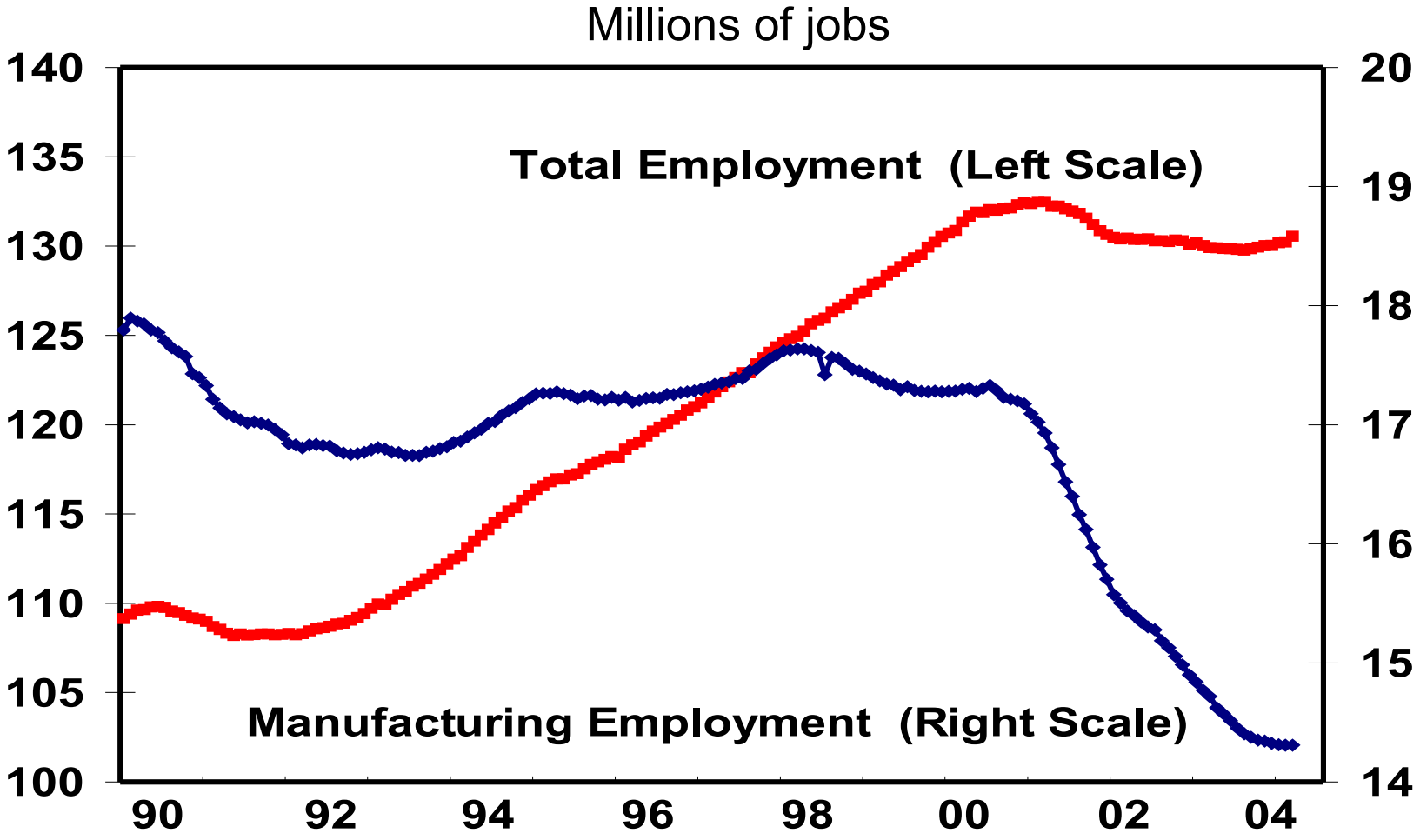
- Global Co-Dependency: The U.S. Story
- An exchange rate scenario using BTM
- Adding an interest rate shock
- Changes in macro and industry structure
- How good are we a modeling the nominal side (institutions, internal, and external)?

Base U.S. Forecast: More investment & exports, less housing

	2003	2004	2005	2006	2007
GDP (% change)	3.1	4.6	3.7	2.9	3.1
Personal consumption	3.1	3.9	3.5	2.6	2.8
Nonresidential investment	2.9	8.7	6.3	5.8	6.1
Residential structures	7.5	-0.2	-1.5	4.8	3.0
Exports	2.0	11.0	9.5	8.5	7.5
Imports	4.0	7.0	6.5	6.0	5.0
Govt expenditures	3.4	1.6	1.6	1.3	1.0
Industrial production (%)	0.3	5.1	3.8	2.8	3.6
Employment (%)	0.1	1.8	2.0	1.5	1.1
GDP prices (%)	1.7	1.5	1.7	2.2	2.4
Consumer prices (%)	2.3	1.8	2.2	2.6	2.8
Treasury bills, 3-month	1.0	1.4	2.2	3.0	3.0
Yield, 10 yr. Treasury bonds	4.0	4.8	5.5	5.8	5.9
Current acct balance ($ bil)	-587.8	-602.2	-603.0	-639.4	-633.5
% of GDP	-5.4	-5.2	-4.9	-5.0	-4.6

Source: Inforum

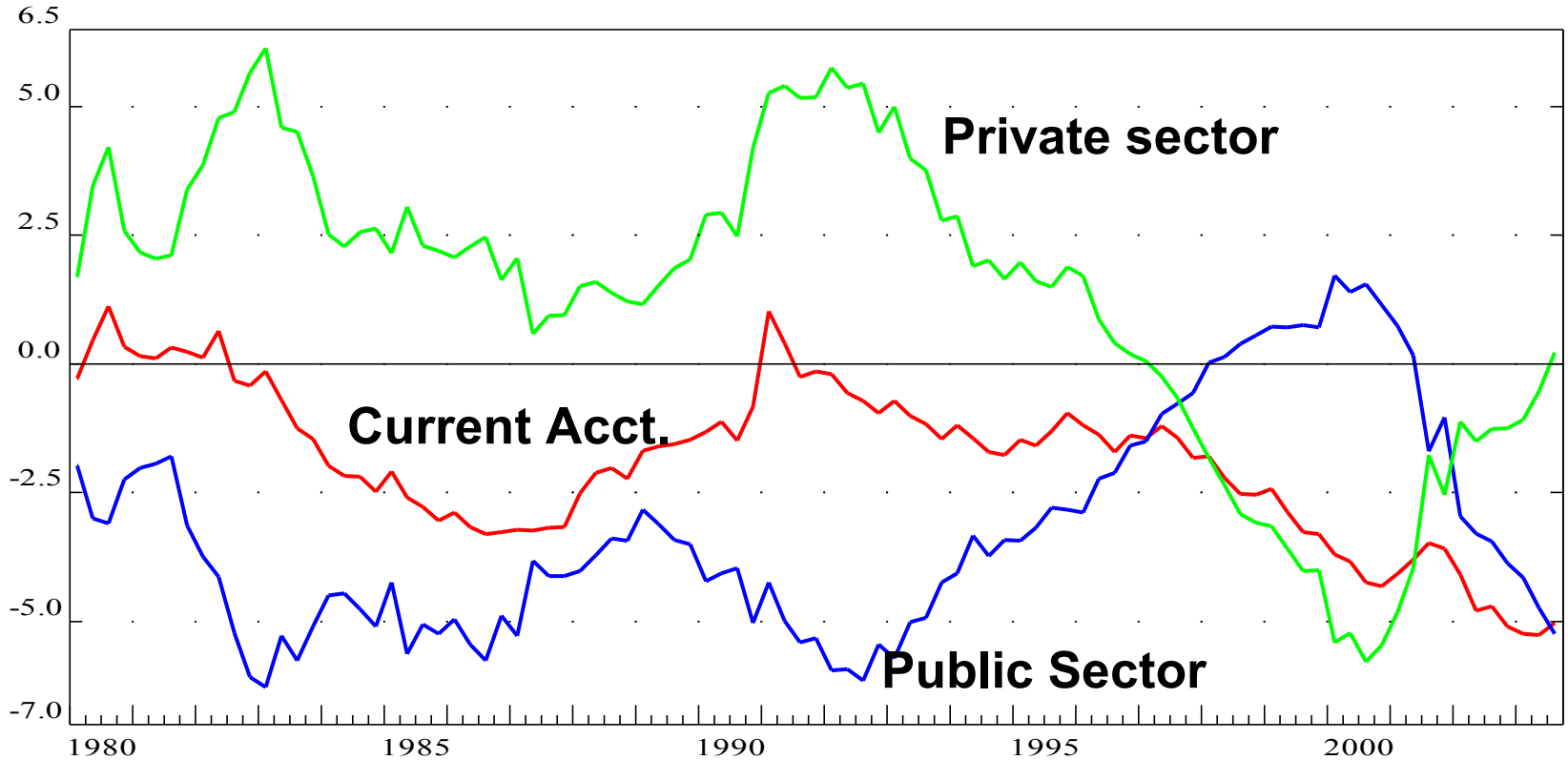
Lack of employment growth is puzzling



But is growth build on debt sustainable over the intermediate term?

U.S. Demand is still being driven by **borrowing**

Net lending (borrowing) as percent of GNP



Source: Bureau of Economic Analysis

U.S. Fiscal Situation is Unsustainable

At End of FY 03

Explicit Gross Debt:

- Debt held by the public — $3.9Tr
- Trust fund debt — $2.9Tr
- Explicit Gross debt — $6.8Tr ~ $24K per person

Implicit Debt:

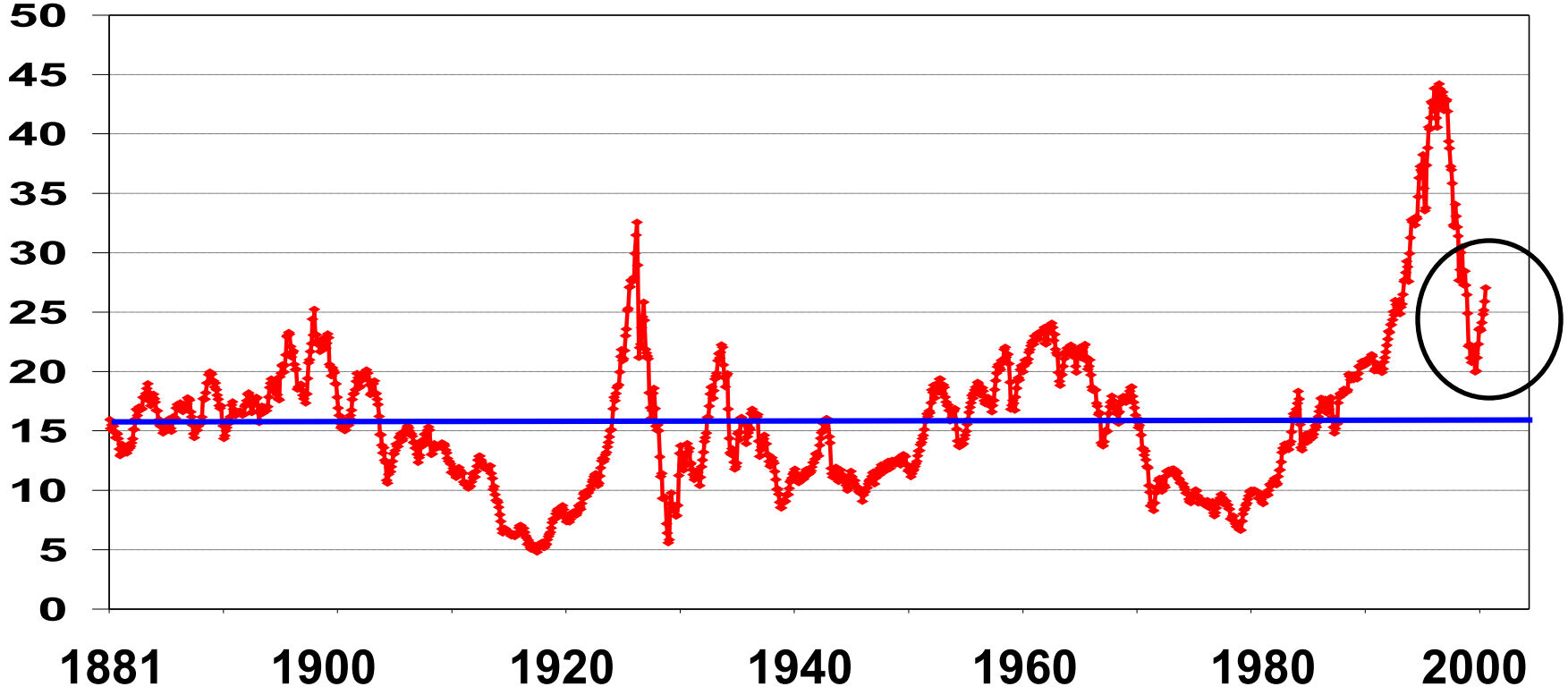
- Liabilities not accounted for above -- $23.2 trillion
  - Includes NPV of 75 year projected liabilities of Social Security ($3.5 trillion) and Medicare ($15.5 trillion) costs not covered by trust funds (all recently revised upward).

- **Explicit+implicit debt -- $30 Tr ~ $100 K per person**

Source: www.gao.gov

Do fundamentals support recent rise in equity prices?

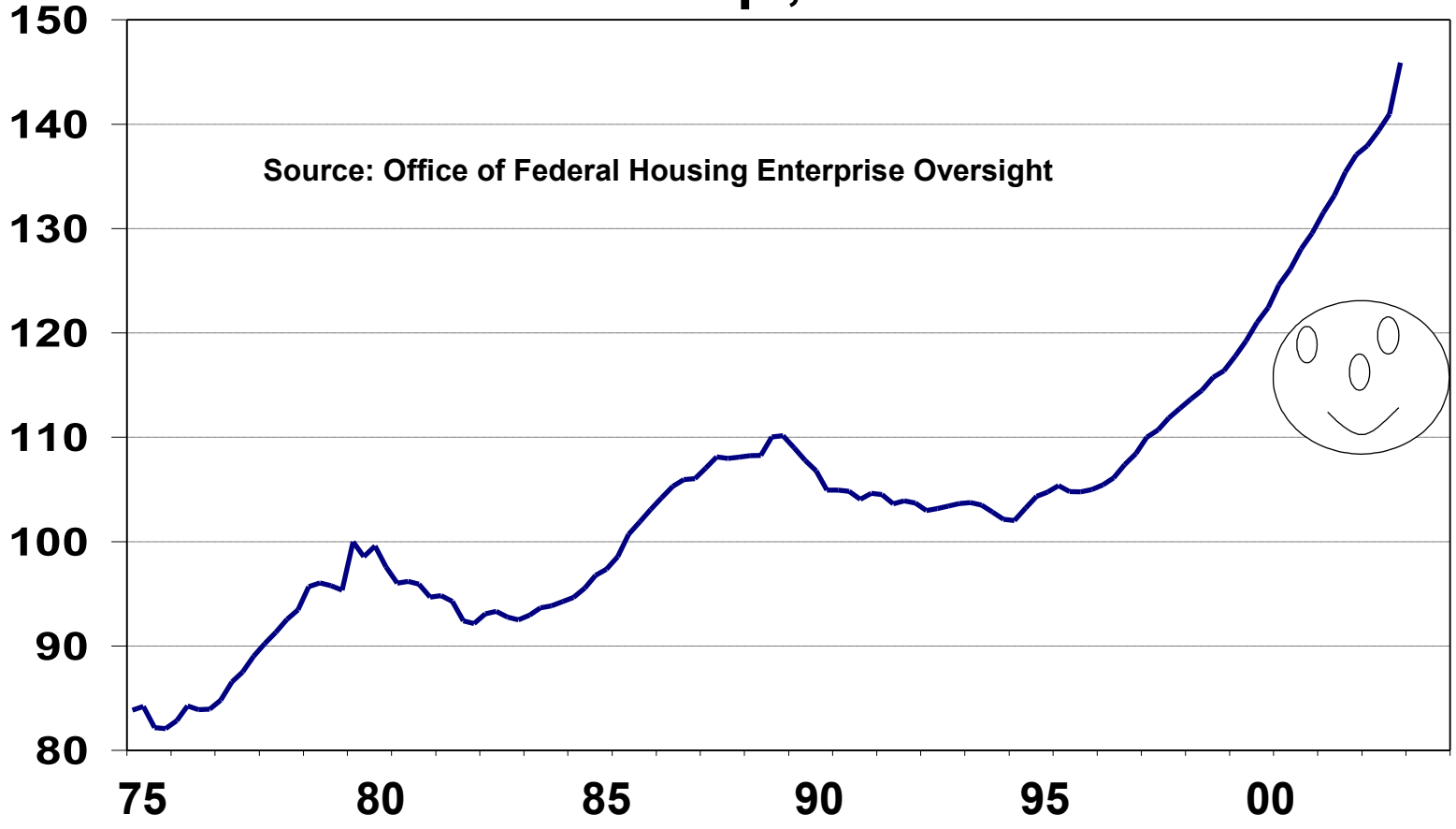
S&P 500 Real price to earnings ratio, 1881-2004



Source: Robert Shiller, Princeton University

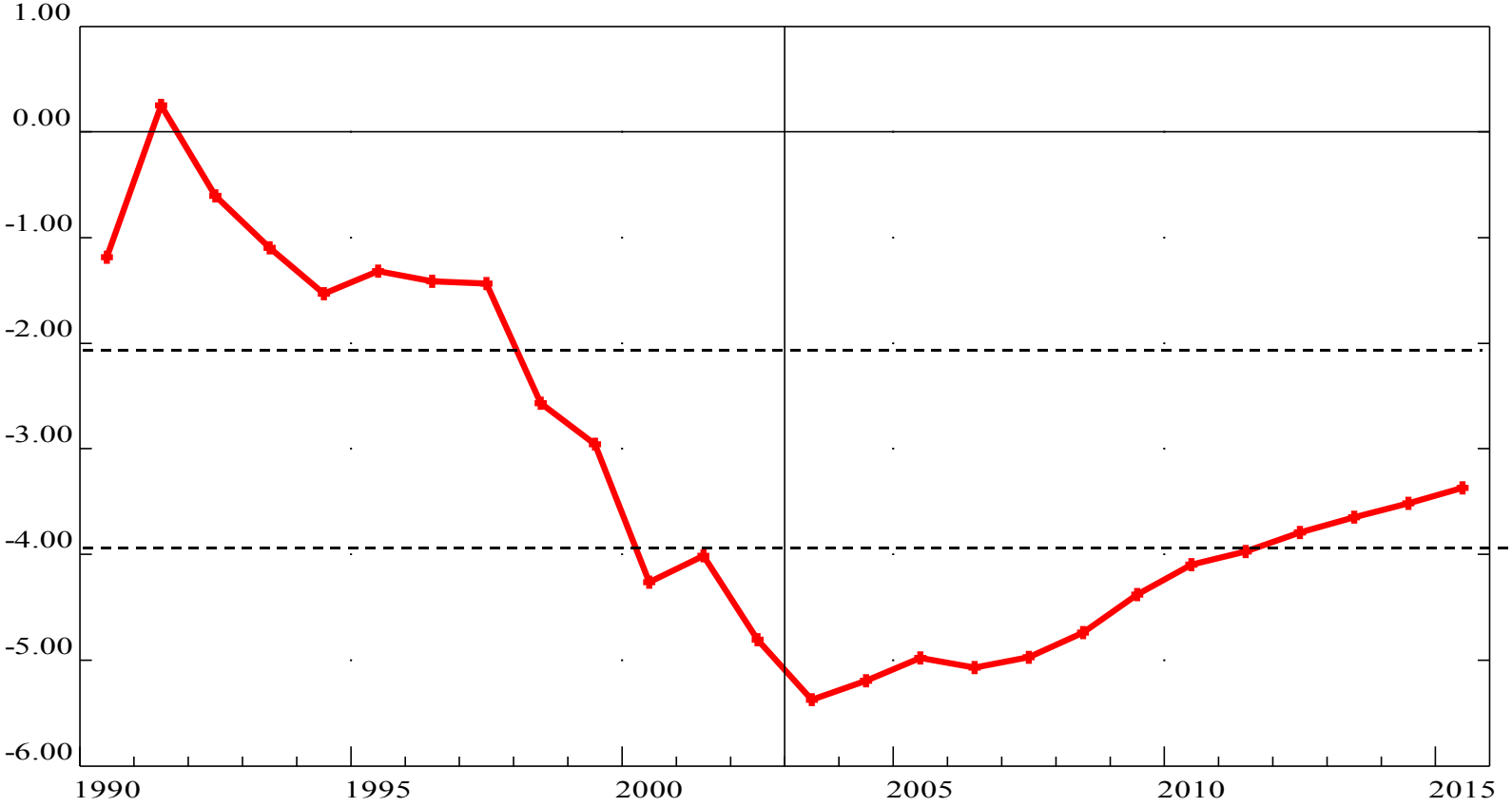
The next bubble?

U.S. Housing Price Index, Inflation Adjusted
1975 to 2002q2, 1980 = 100

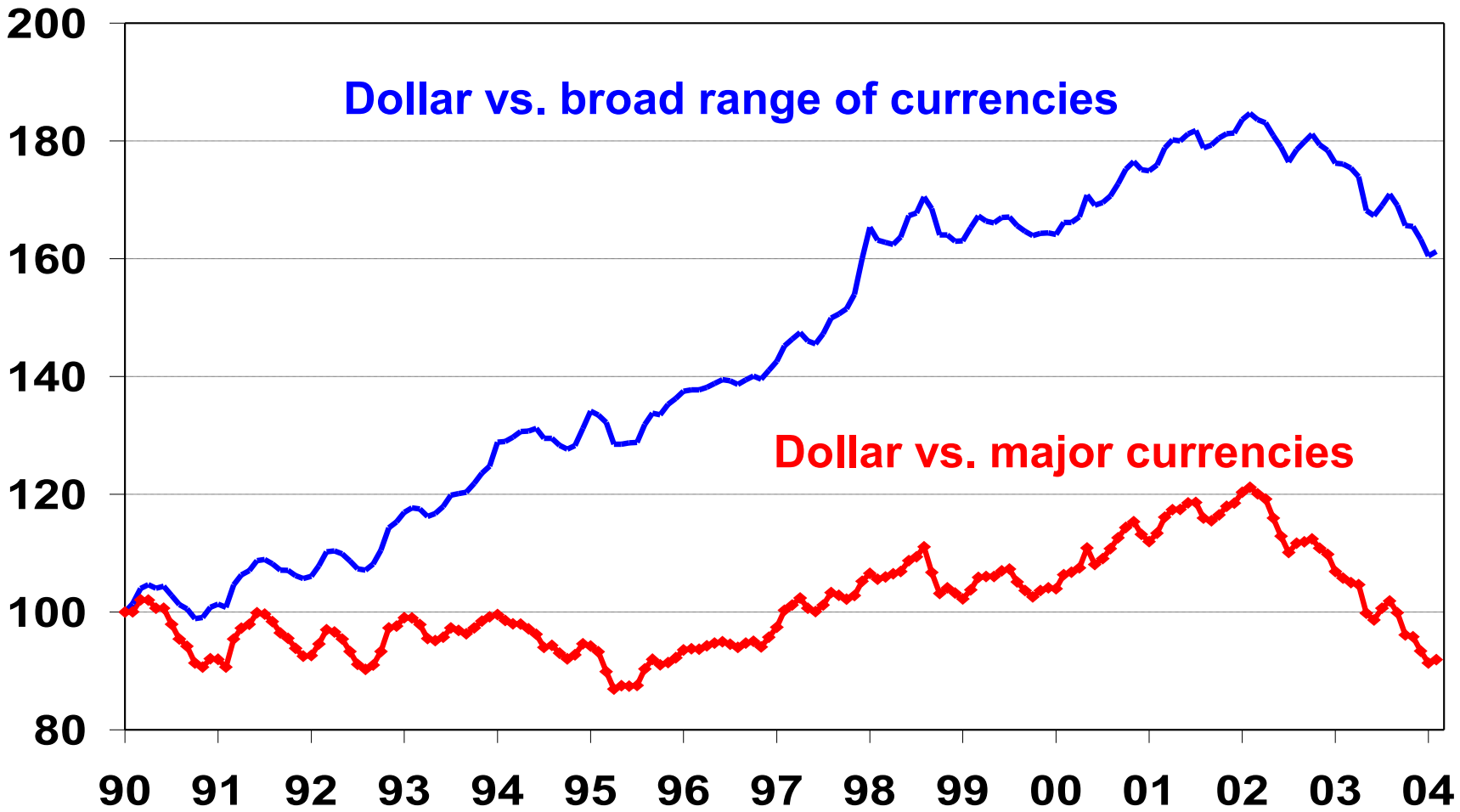


Is the baseline current account sustainable?

Current Account Balance as Percent of GNP

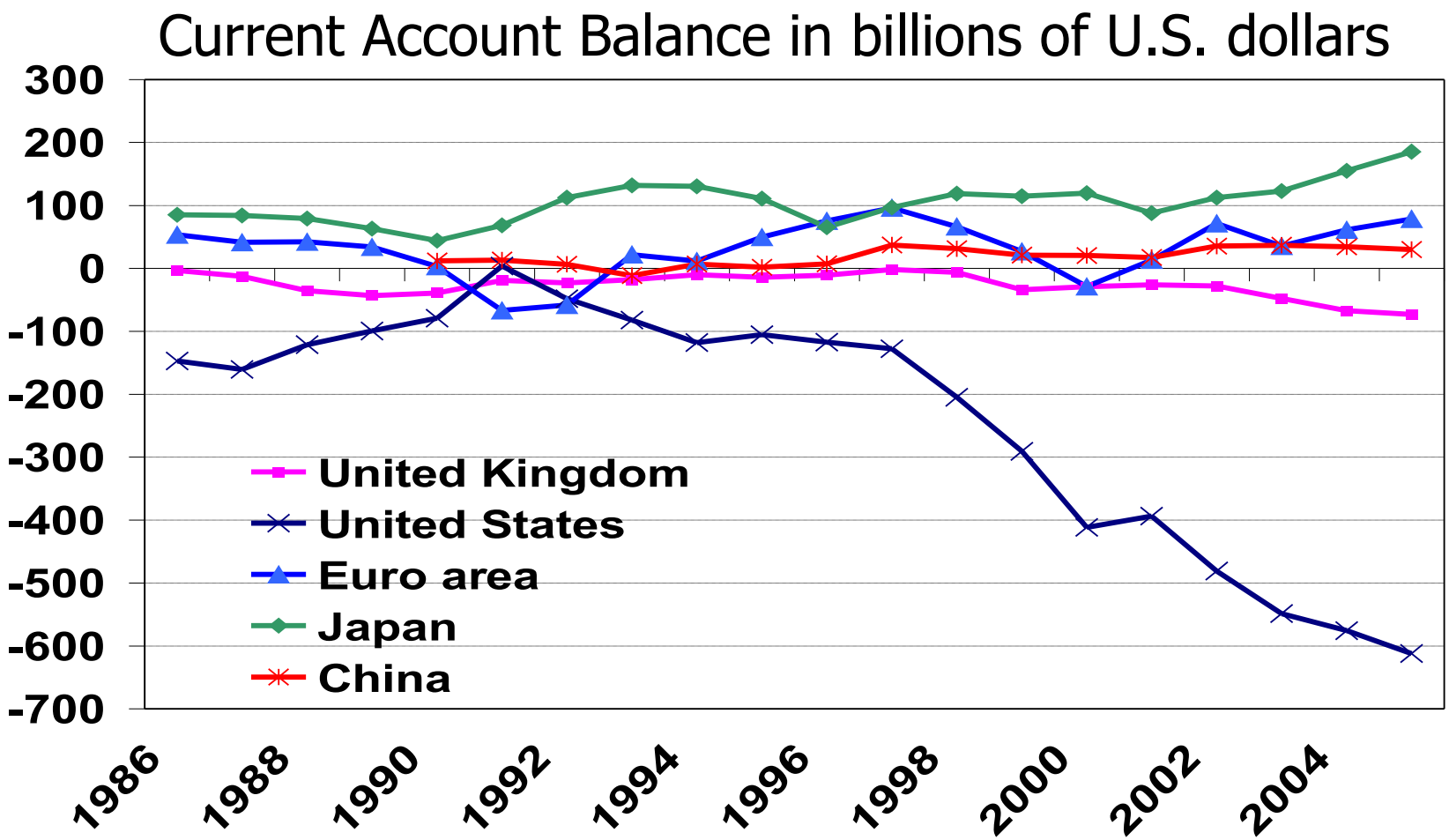


Twin deficits trigger depreciation of dollar. Ultimate impact depends on trading partners.



Source: Federal Reserve Board

Intermediate term: Does sustained global recovery requires rebalancing of trade and capital flows?



Source: OECD, EIU

Is the U.S. different?

- Freund, "Current Account Adjustment in Industrialized Countries," BoG FRB: 4-5% CA/GDP deficit triggers adjustment

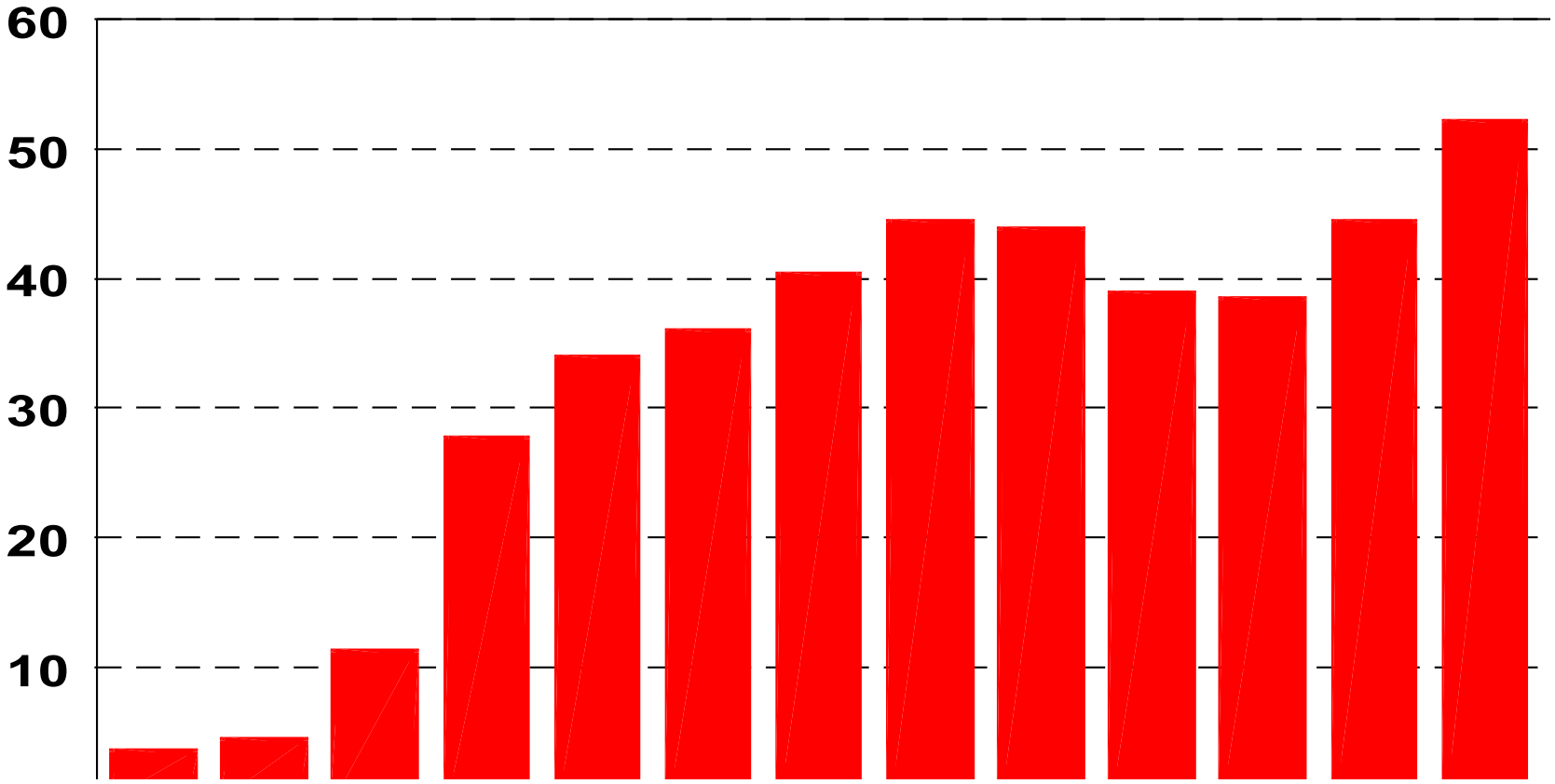
  But U.S. borrows in home currency, debt service with minimal hardships.

- Relative return: U.S. most dynamic and fastest growing developed country. Investors want to overweight here.

  Catherine Mann, IIE: Narrowing of return differential and portfolio analysis show recent inflow excessive, producing depreciation. Room for further depreciation up to 40%.

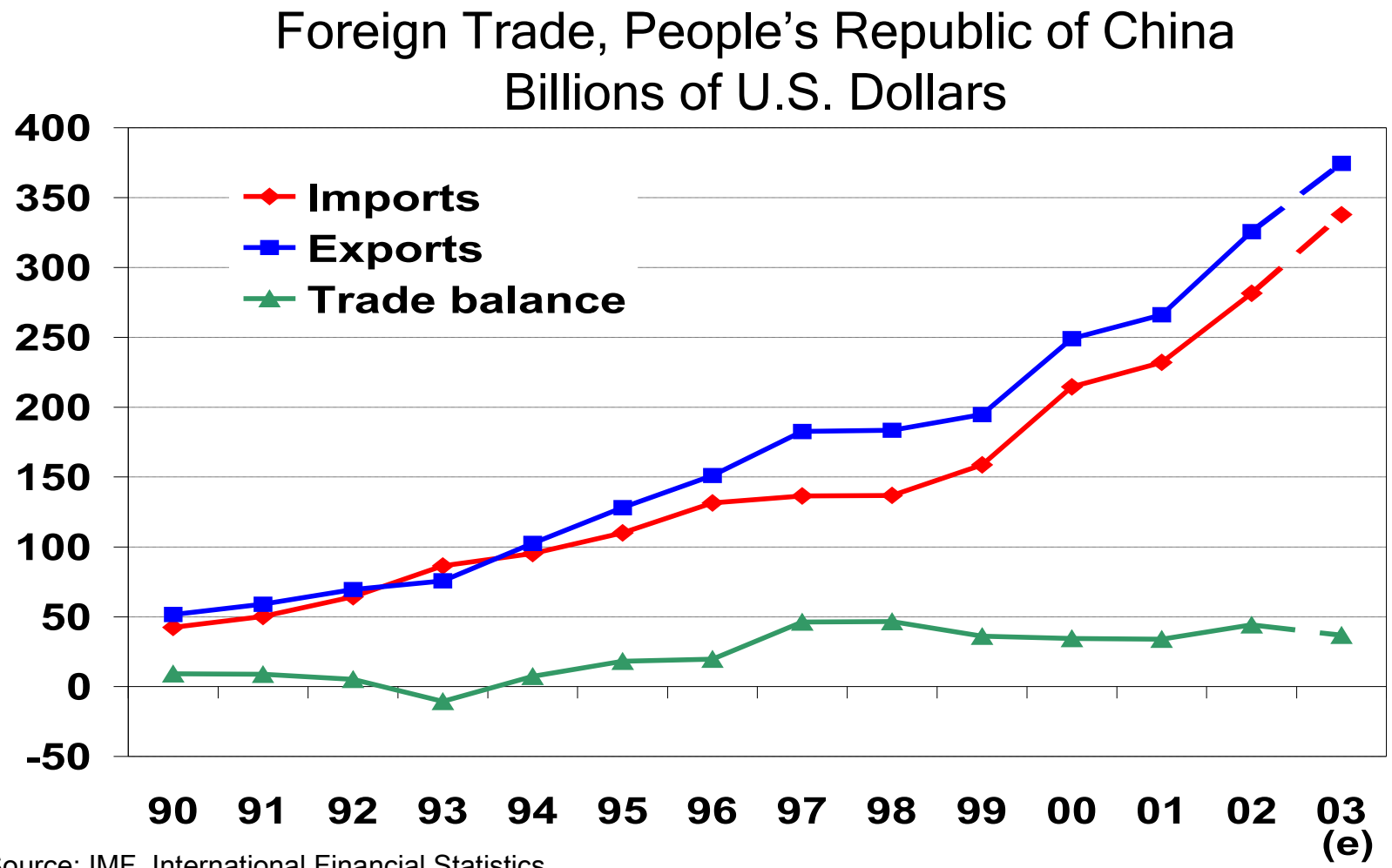
China: Foreign Direct Investment is gushing in.

FDI Inflow to People's Republic of China, Billions of U.S. Dollars



Source: IMF, International Financial Statistics

China's overall trade surplus has been level.

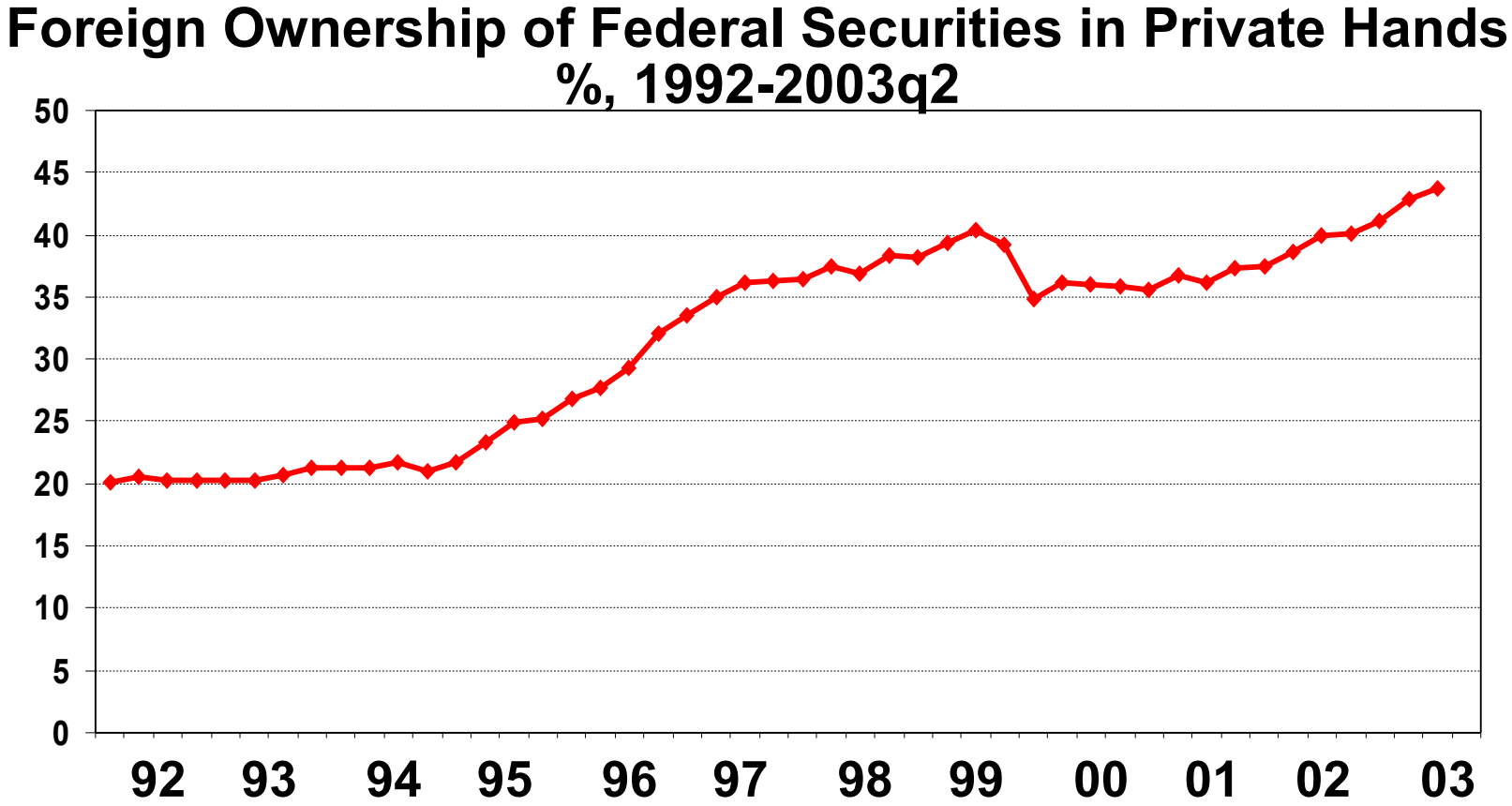


Source: IMF, International Financial Statistics

U.S. Import Demand Driving Trade

Source: U.S. Census

Co-dependency: Asians enable federal deficits in order to sustain exports



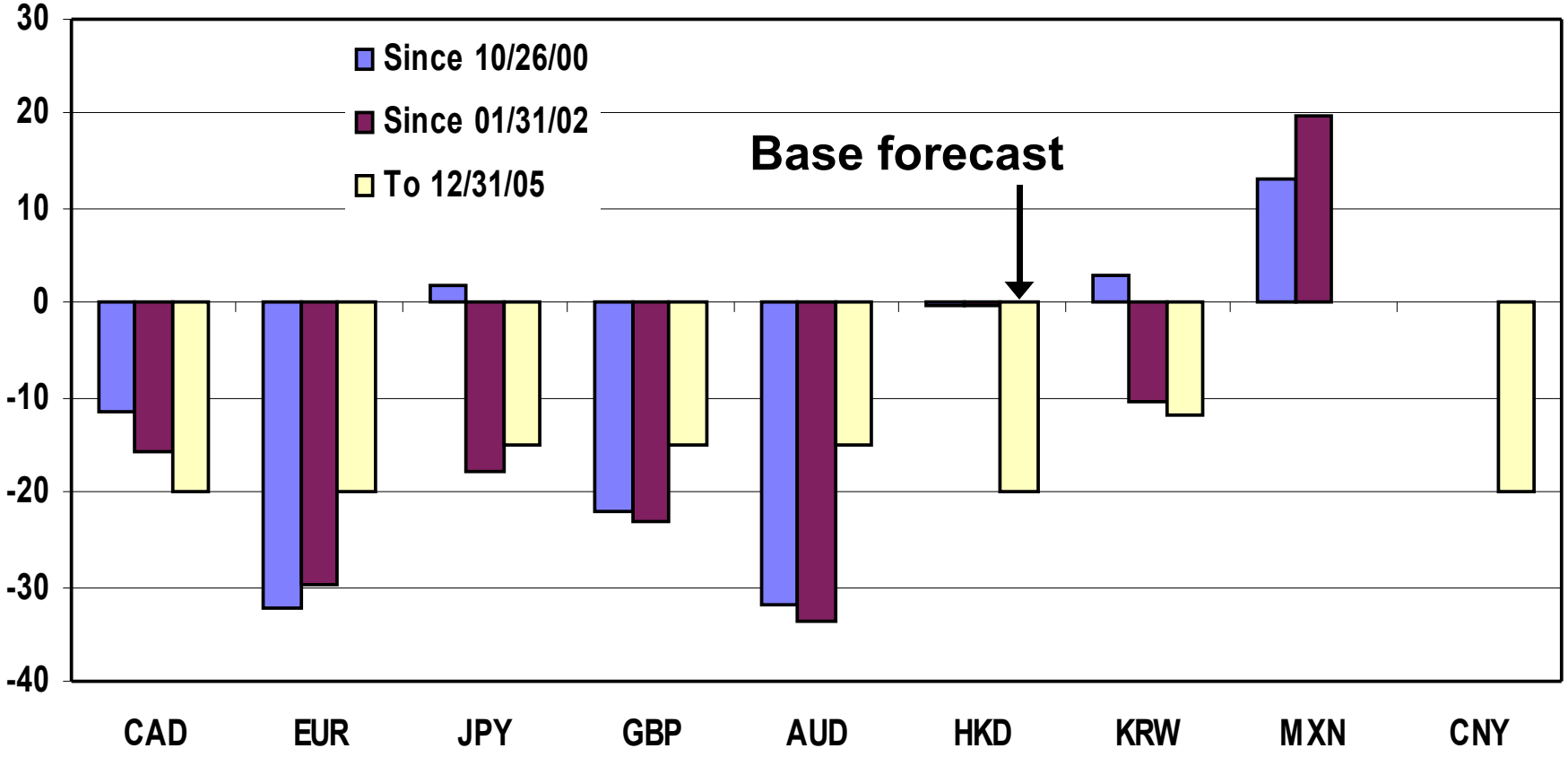
Source: U.S. Treasury Department

Alan Greenspan, Nov 20, 2003: The Case for "Benign Resolution."

- **"To date, the widening to record levels of the U.S. ratio of current account deficit to GDP has been seemingly uneventful."**
- **"In the end, it will likely be the reluctance of foreign country residents to accumulate additional debt and equity claims against U.S. residents that will serve as the restraint on the size of tolerable U.S. imbalances in the global arena."**
- **"Can market forces incrementally defuse a worrisome buildup in a nation's current account deficit and net external debt before a crisis more abruptly does so?"**
- **"The history of such adjustments has been mixed." (e.g., EU – 1992, Mexico, Thailand, et. al., Russia, Brazil, Argentina…)**
- **"I conclude that spreading globalization has fostered a degree of international flexibility that has *raised the probability of a benign resolution* of the U.S. current account imbalance… greater flexibility allows economies to adjust more smoothly … with *less risk of destabilizing* outcomes." (*italics added*)**

Exchange rate adjustments must be more distributed across main trading partners

Percent change in USD vs. selected currencies



Source: Pacific Exchange Rate Service

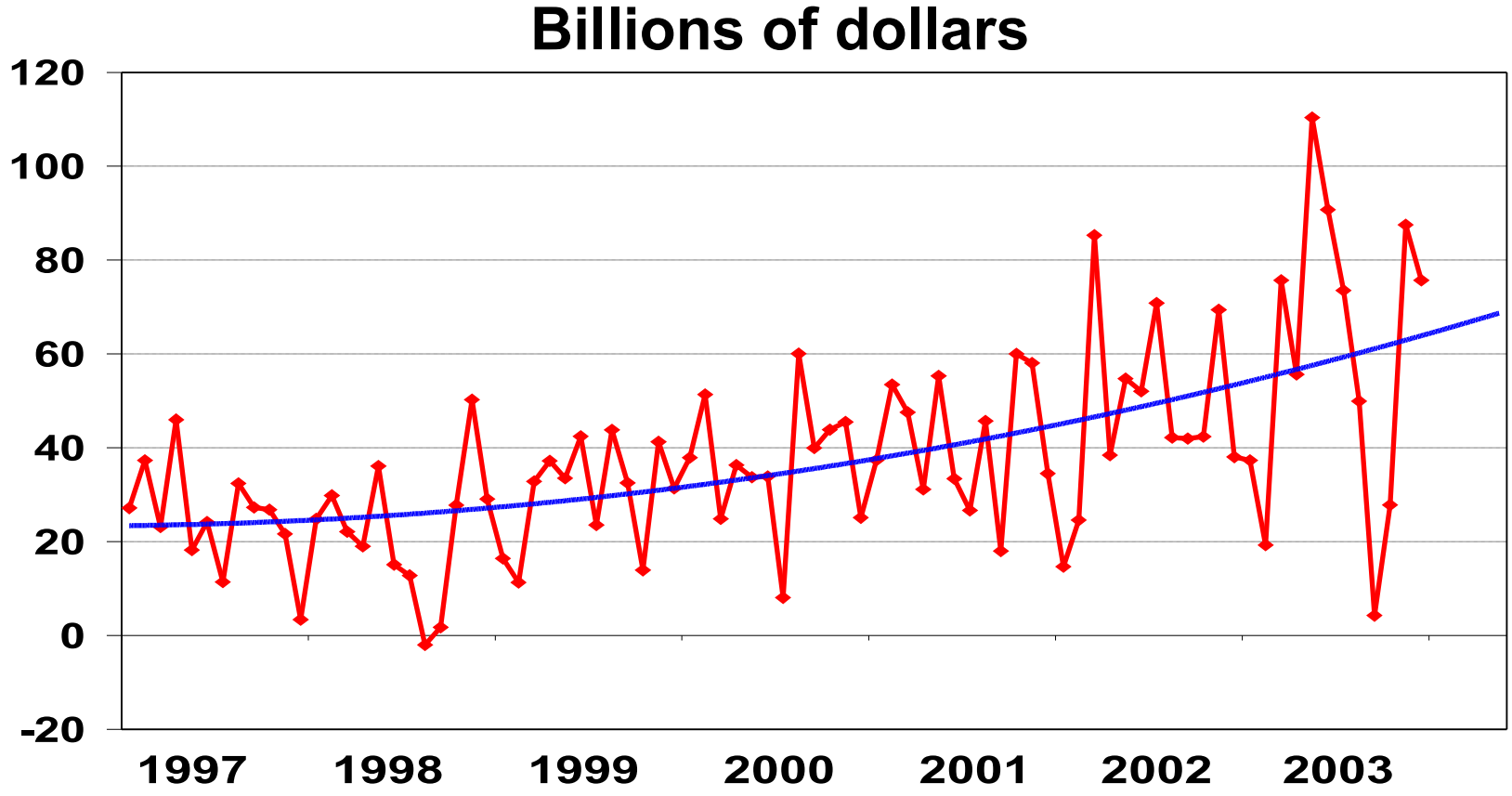
What about Asia (read: China)?

- NAM, MAPI, et. al.
  Asian currency manipulation is destabilizing, unfair, illegal.
- IMF World Economic Outlook, Oct 2003
  Asian reserves higher than warranted, countries should reduce intervention and increase flexibility.
- Dooley, et. al. "Revived Bretton Woods"
  New Bretton-Woods. Asia content to accumulate low-yield reserves to stabilize rates and develop economies.
- Lardy & Goldstein, IIE
  China ready for 20% revaluation, but not full liberalization.
- CBO
  Complete float could cause instability and/or depreciation.
- Greenspan
  Global recovery and emerging Asian inflationary pressures mean that days of intervention are numbered.

Will yuan appreciation matter?

- Currency appreciation is important facet of economic development.
- Reduces "marginal" price competitiveness, and growth of bilateral deficit.
- Reduces FDI growth.
- Reduces incentive for Asian supply chain partners to resist appreciation.
- Divert pressures of China development to other trading partners.
- Decreases inflationary pressure in China.
- Increase domestic income and demand in China.

Portfolio capital inflows growing, volatile



Source: U.S. Treasury Department

Risks for hard landing are high.

- Recent experiences in international financial adjustments have been difficult.
- High-risk market behavior returning (bank & hedge fund trading).
- Utility of dollar fall depends on improved growth in trading partners (espec. EU and Japan).
- Potential non economic shocks: war & terror.
- Diplomatic rancor producing a retreat from globalization.
- Little suggests recovery to increase national savings.

Global implications of hard landing

- U.S. based manufacturing potential expands
- Interest rate sensitive sectors hit hard
- Possible global financial turbulence
- Europe – stronger euro stimulates brutal competitive pressures, will monetary policy respond?
- Asia – fall in demand and stronger exchange rates hit still-immature economies
- Latin America – higher interest rates aggravate debt service, holding back growth
- Reducing U.S. deficit to zero would entail very large depreciation and substantial hardship (all-around).

Scripting current account scenarios

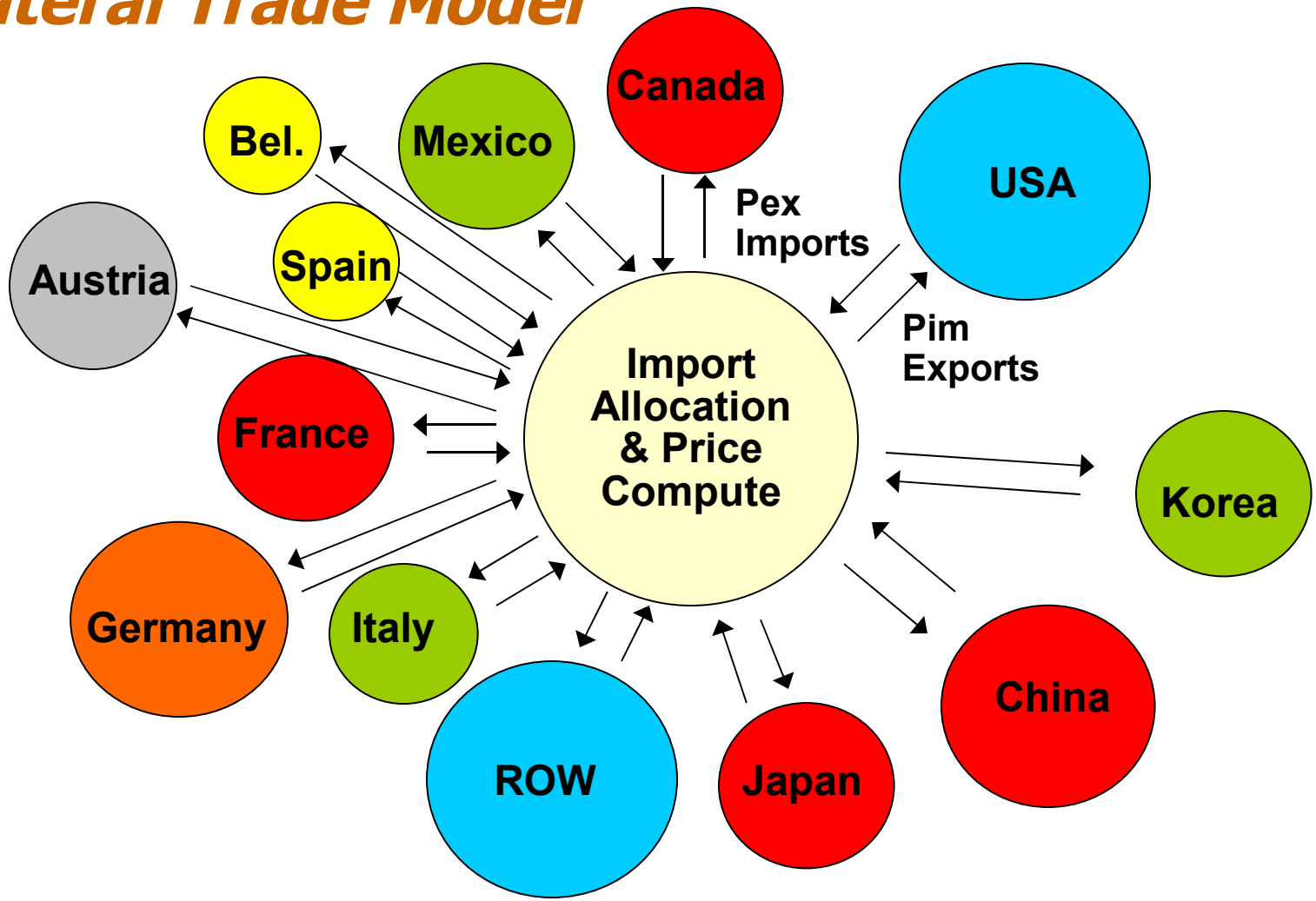
- Base case: Gradual reduction of CA/GNP, stabile in absolute terms. (A)
- Expenditure switching: Absolute deficit reduction thru exchange rate shock only. (B)
- Expenditure switching + reduction:
  Exchange rate shock accompanied by interest rate shock. (C)

Exchange rate shock
-- works with lag and incomplete pass-through

Changes in baseline exchange rates

	2004	2005	2006
Canadian dollar	-10.0	-5.0	-5.0
Mexican peso	-2.0	-2.0	-2.0
Euro	-10.0	-5.0	-5.0
UK pound	-10.0	-5.0	-5.0
Japanese yen	-5.0	-5.0	-5.0
Korean won	-8.0	-4.0	-4.0
Chinese yuan	-10.0	0.0	0.0
Price Lag:	0.5	0.3	0.2
Pass through:	0.5		

Feed new exchange rates into Bilateral Trade Model



Exchange rate change accounting

- For any given commodity and year (indices):

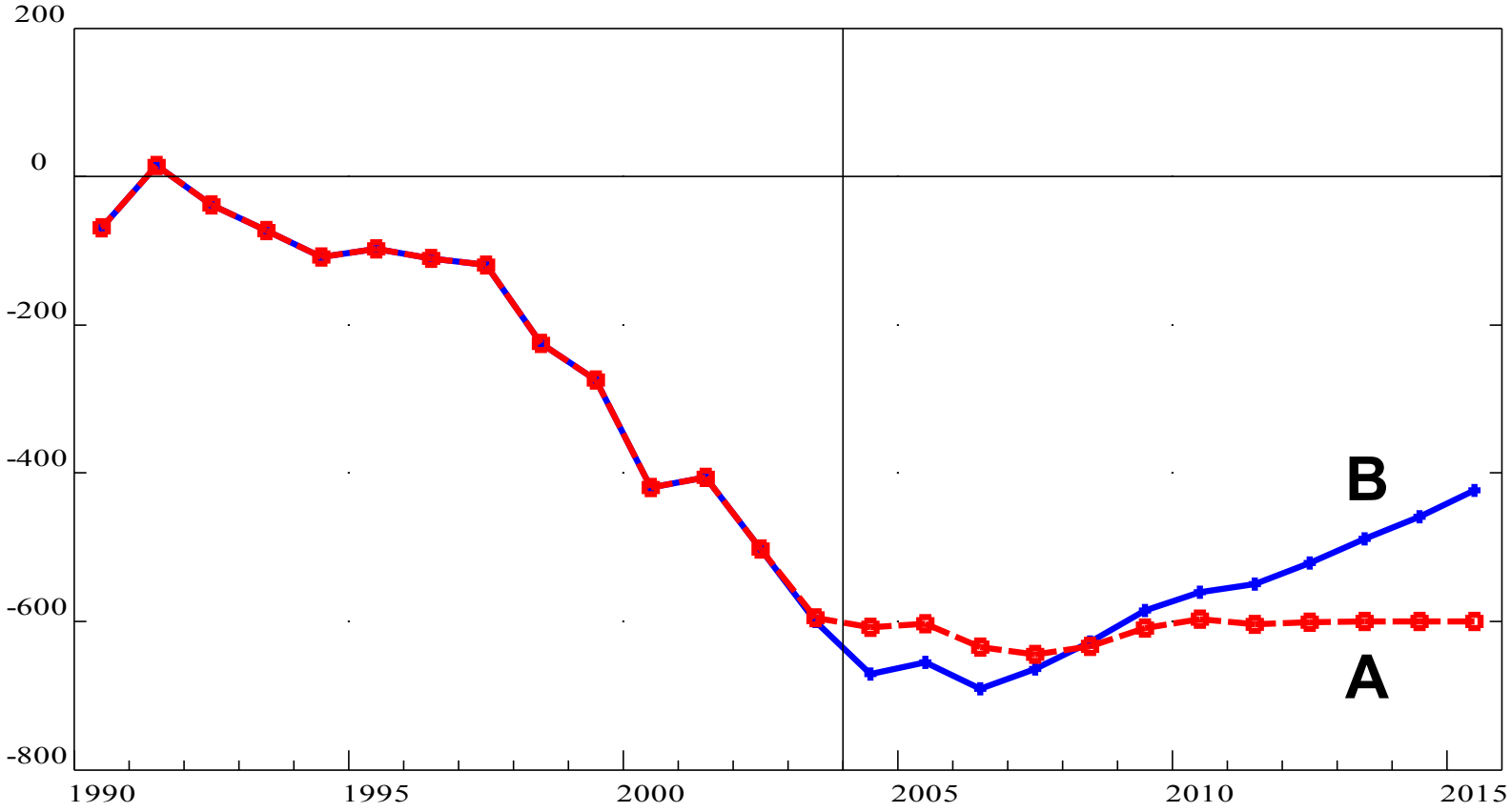
$$PM = \sum_j w_{j,us} * PX_j * er_j$$

- Alternative import prices is:

$$PM' = \sum_j w_{j,us} * PX_j * er_j - (.5 * (er_j' - er_j) * er_j$$

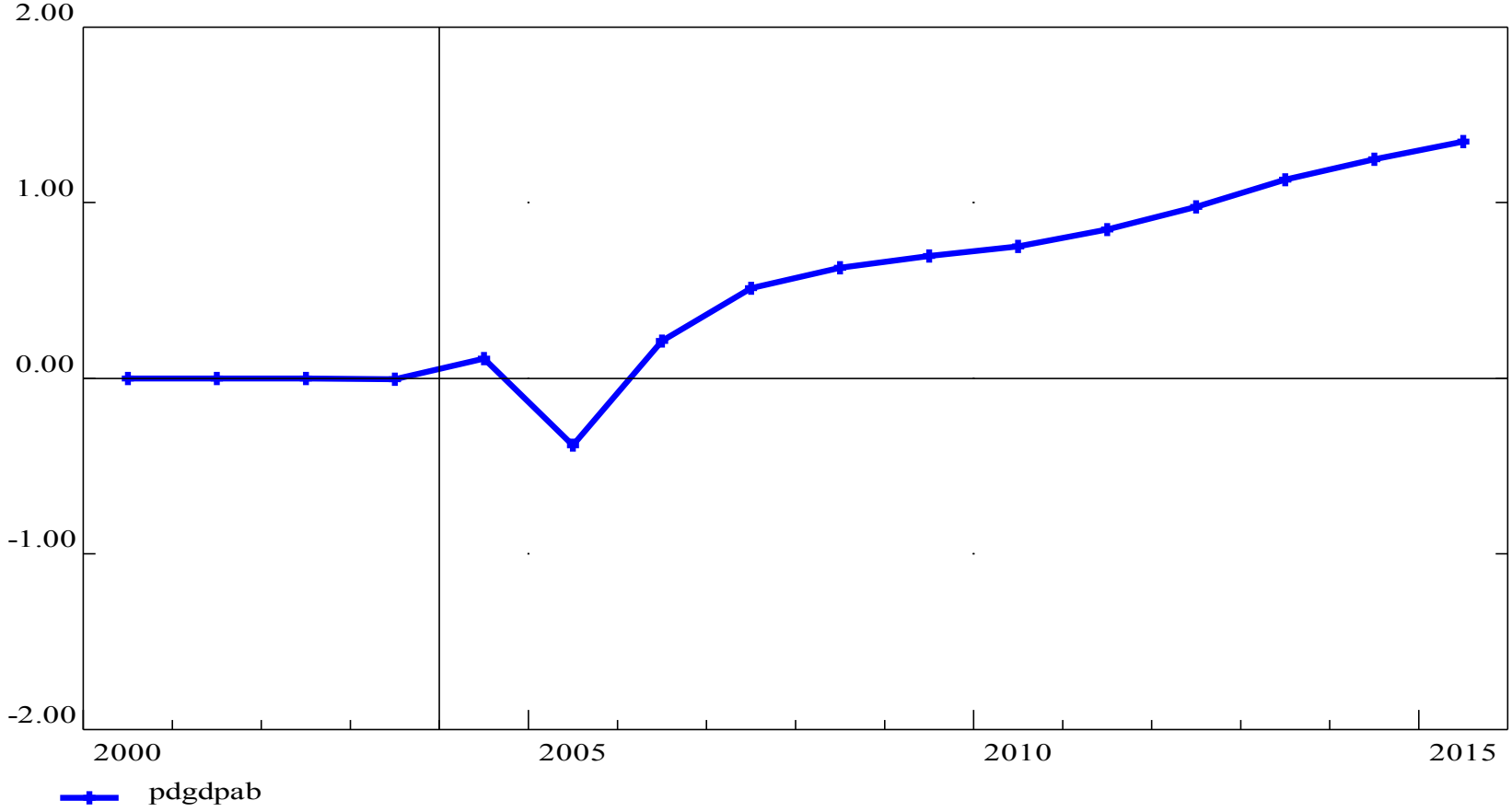
Exchange rate shock (B) produces 33% reduction by 2015

Current account in billion of $



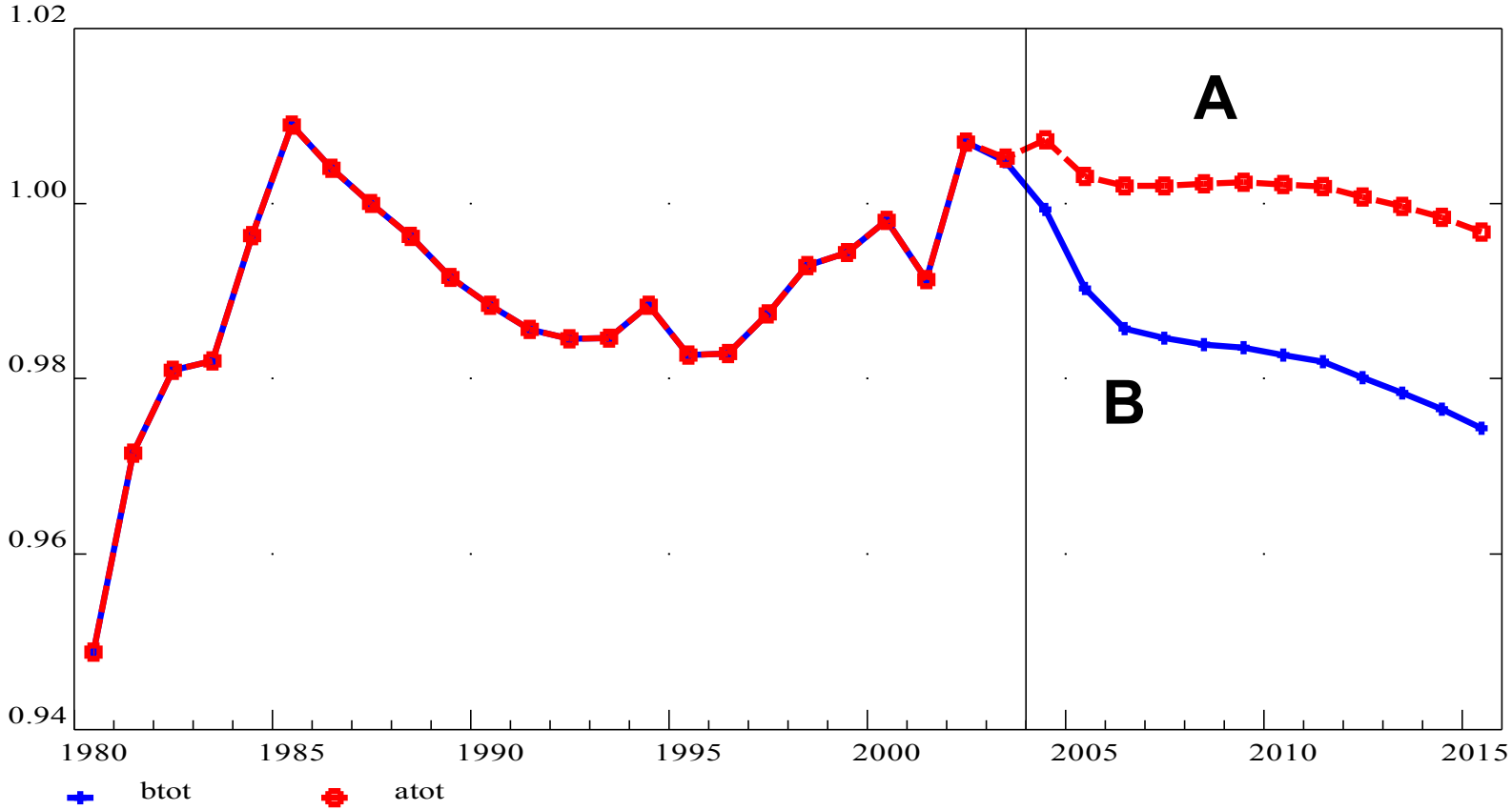
Real GDP slightly higher

Real GDP – B over A – in percent



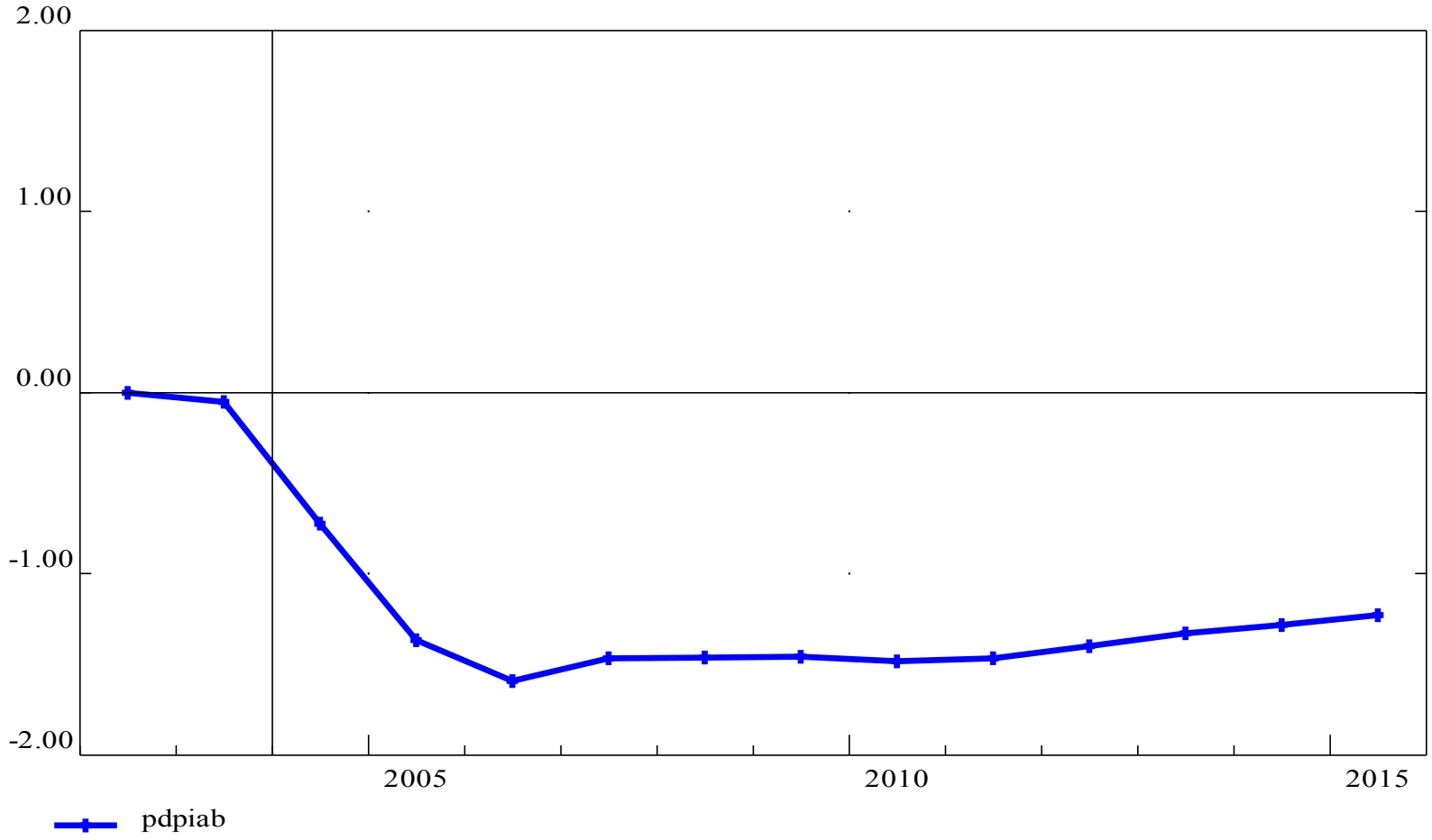
But depreciation means consumers' terms of trade (buying power) worsens

Ratio of GDP deflator to PCE deflator



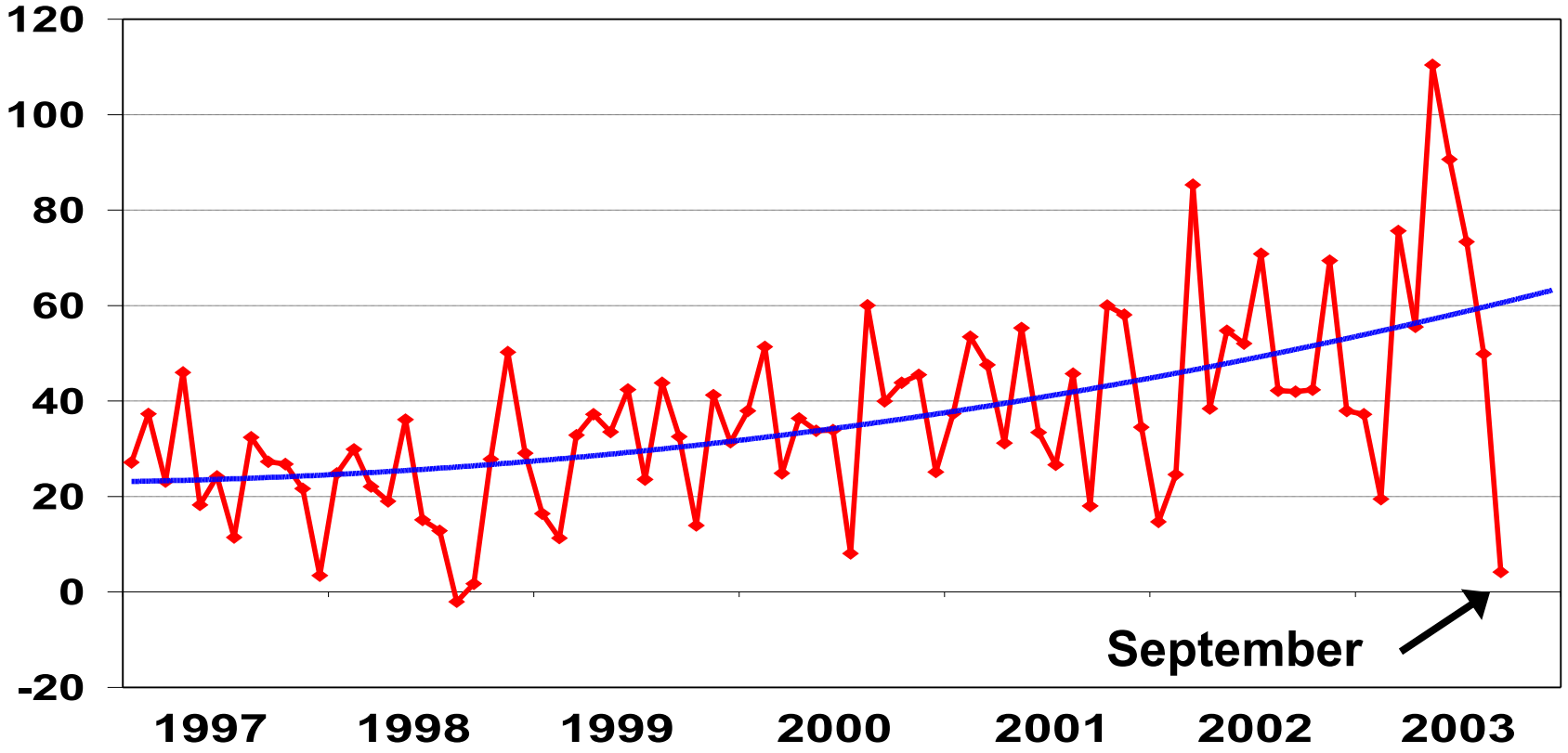
Therefore, overall welfare down

Real Personal Income – B over A – percent

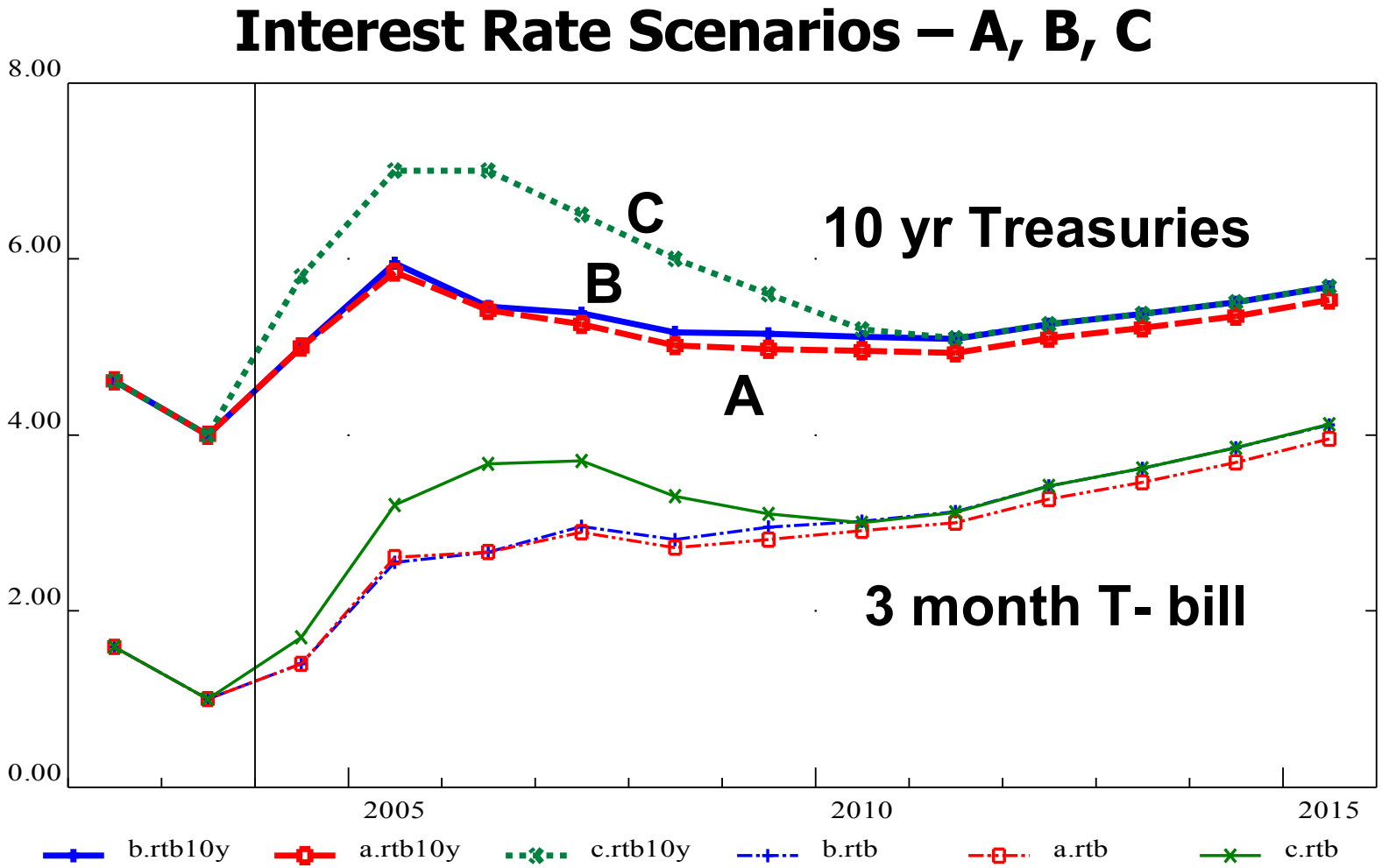


Portfolio capital inflows growing, volatile

Net purchases of U.S. securities by foreigners
Billions of dollars

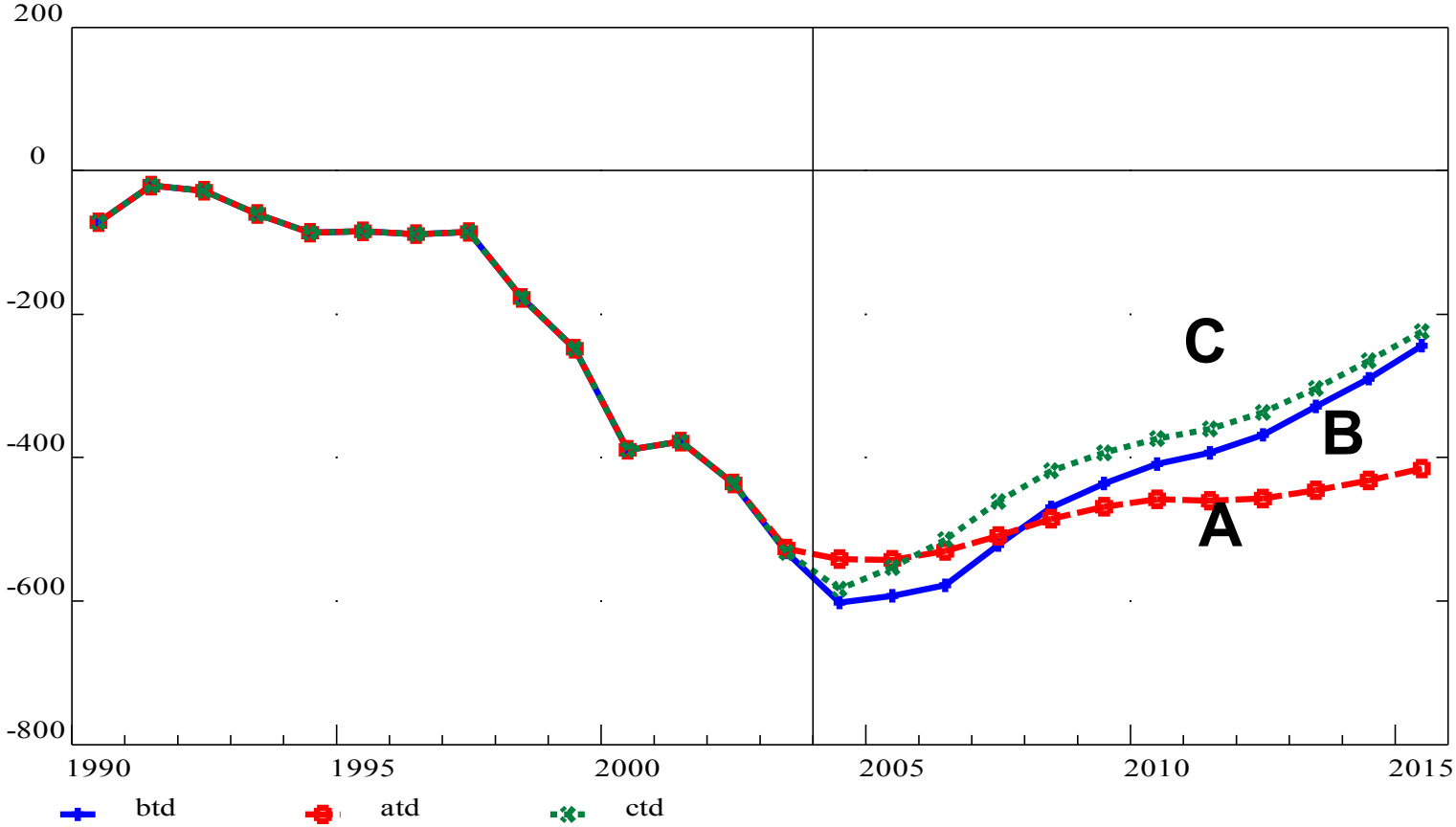


What happens with bond market turmoil?

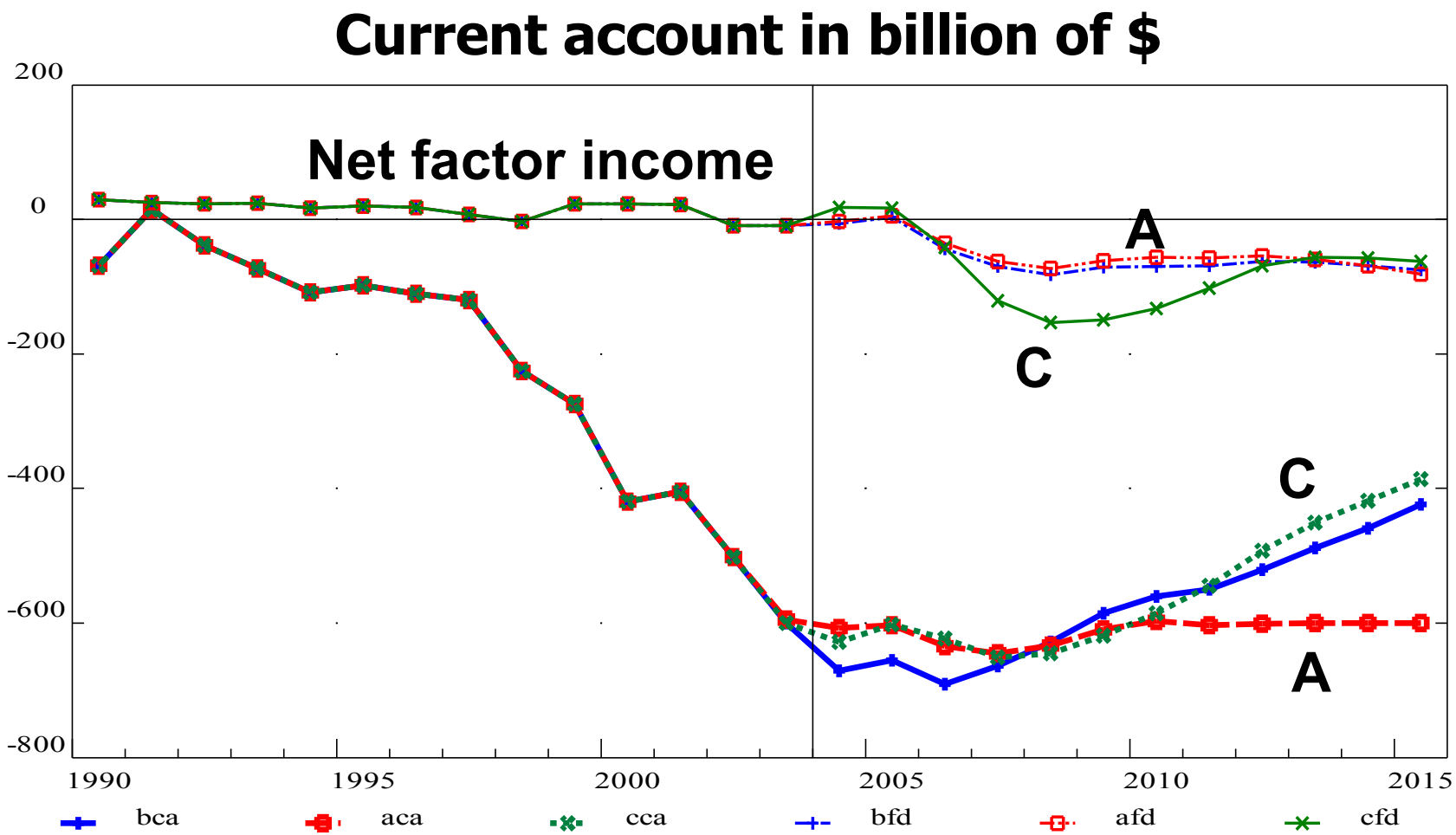


Trade deficit is reduced slightly, but it takes a while.

Trade balance in billion of $

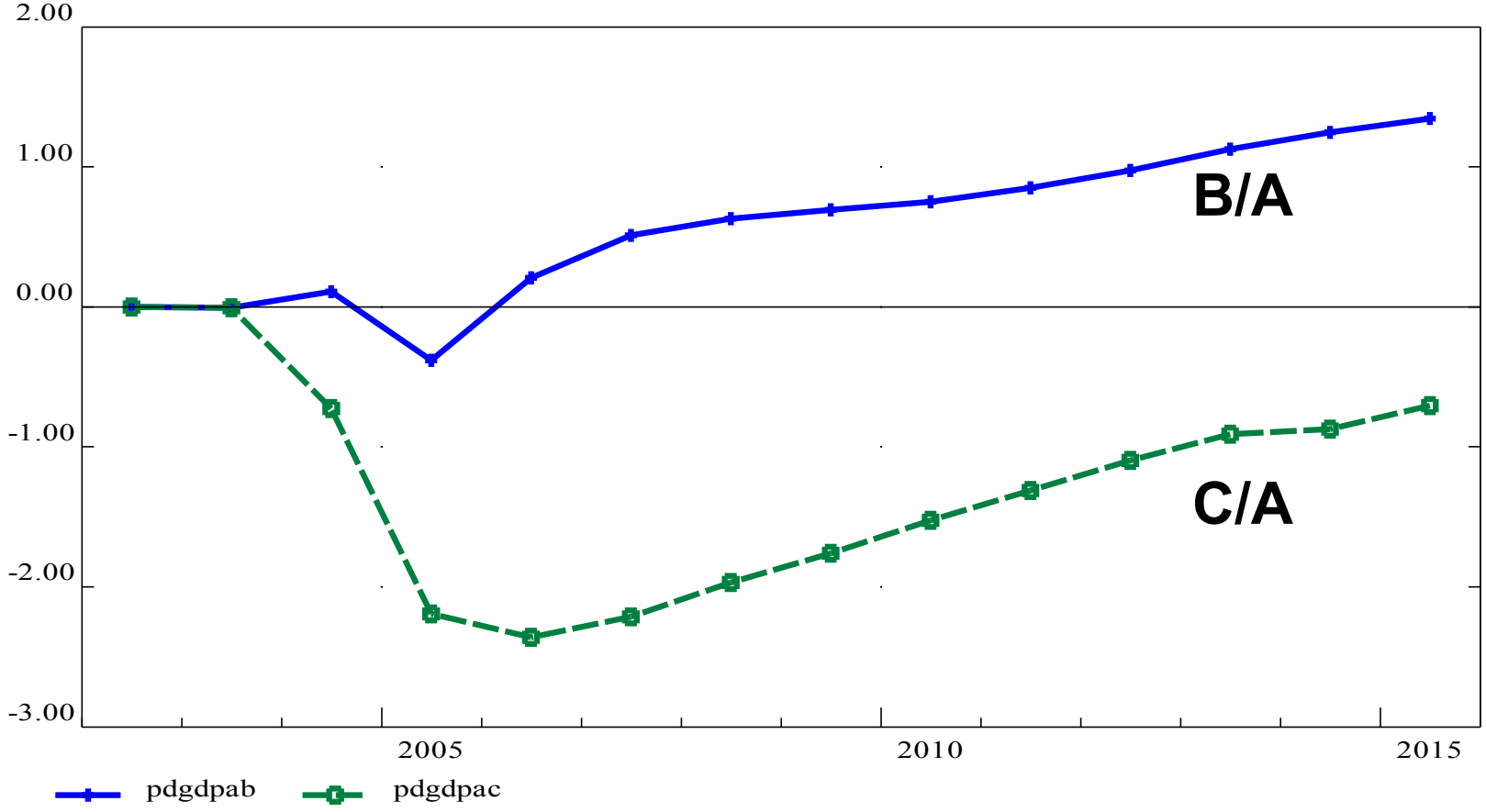


But result on current account is mixed because net factor payments rise.



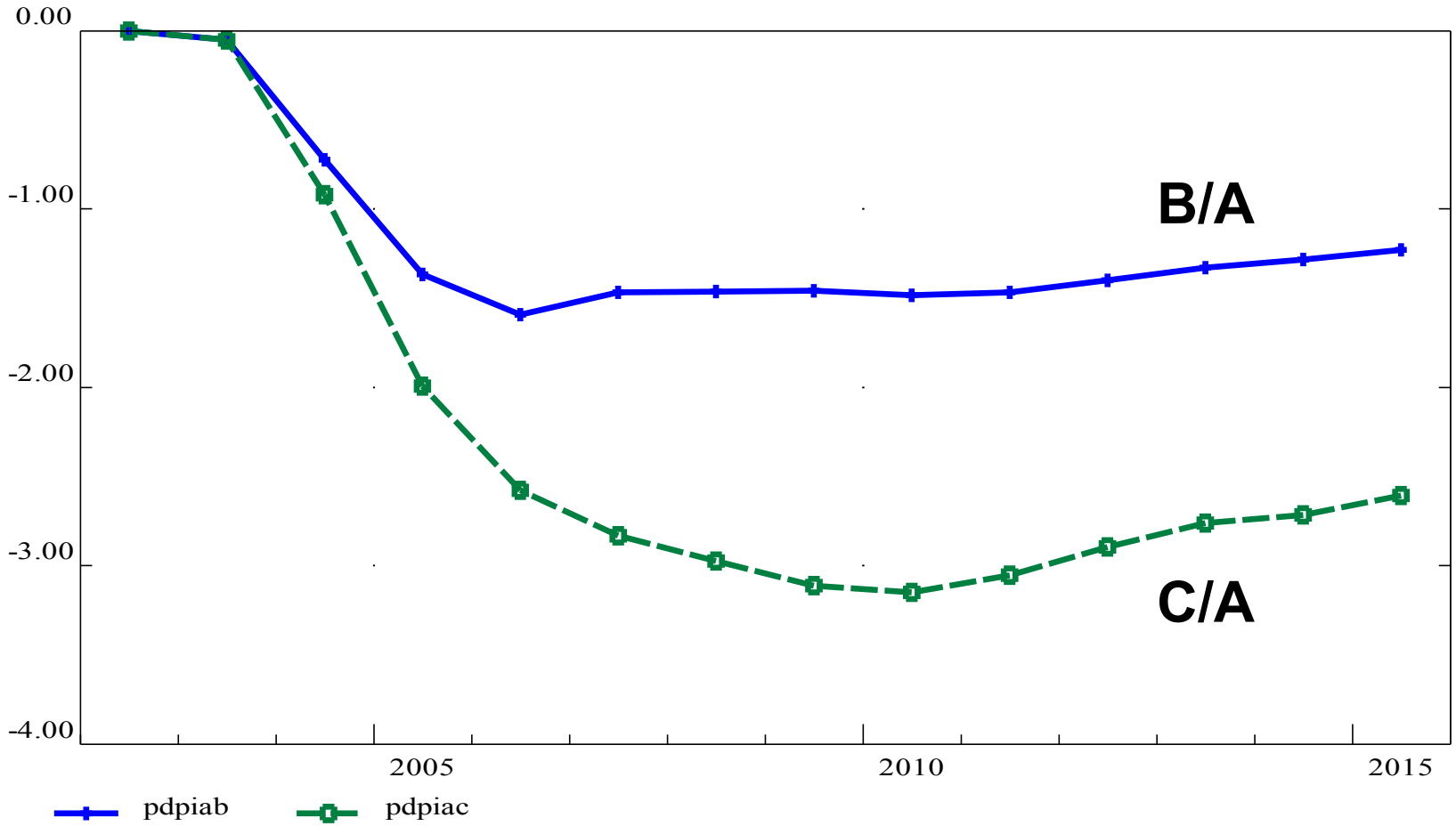
GDP is down

Real GDP – B, C over A – in percent



Welfare down more substantially

Real Personal Income – B, C over A – percent



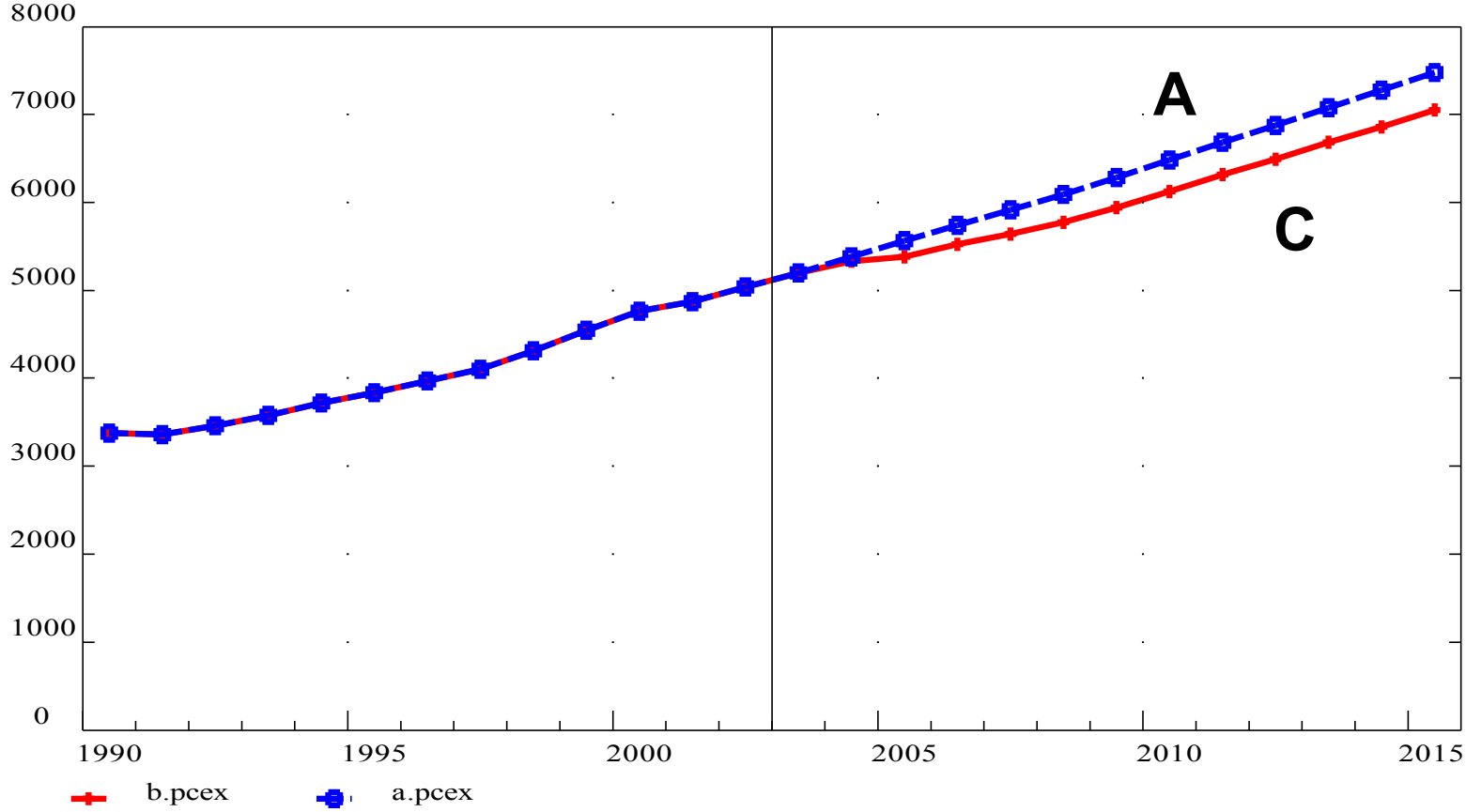
Reflection: What could happen?

- There is No Free Lunch: Pure expenditure switching is probably not plausible. Significant dollar depreciation will likely be accompanied by real interest rate increases, and, therefore, output and significant welfare losses.

- One-time exchange rate and interest rate shocks shown here produce only moderate current account changes. A series of similar shocks would be required to balance the account, but could produce significant hardships.

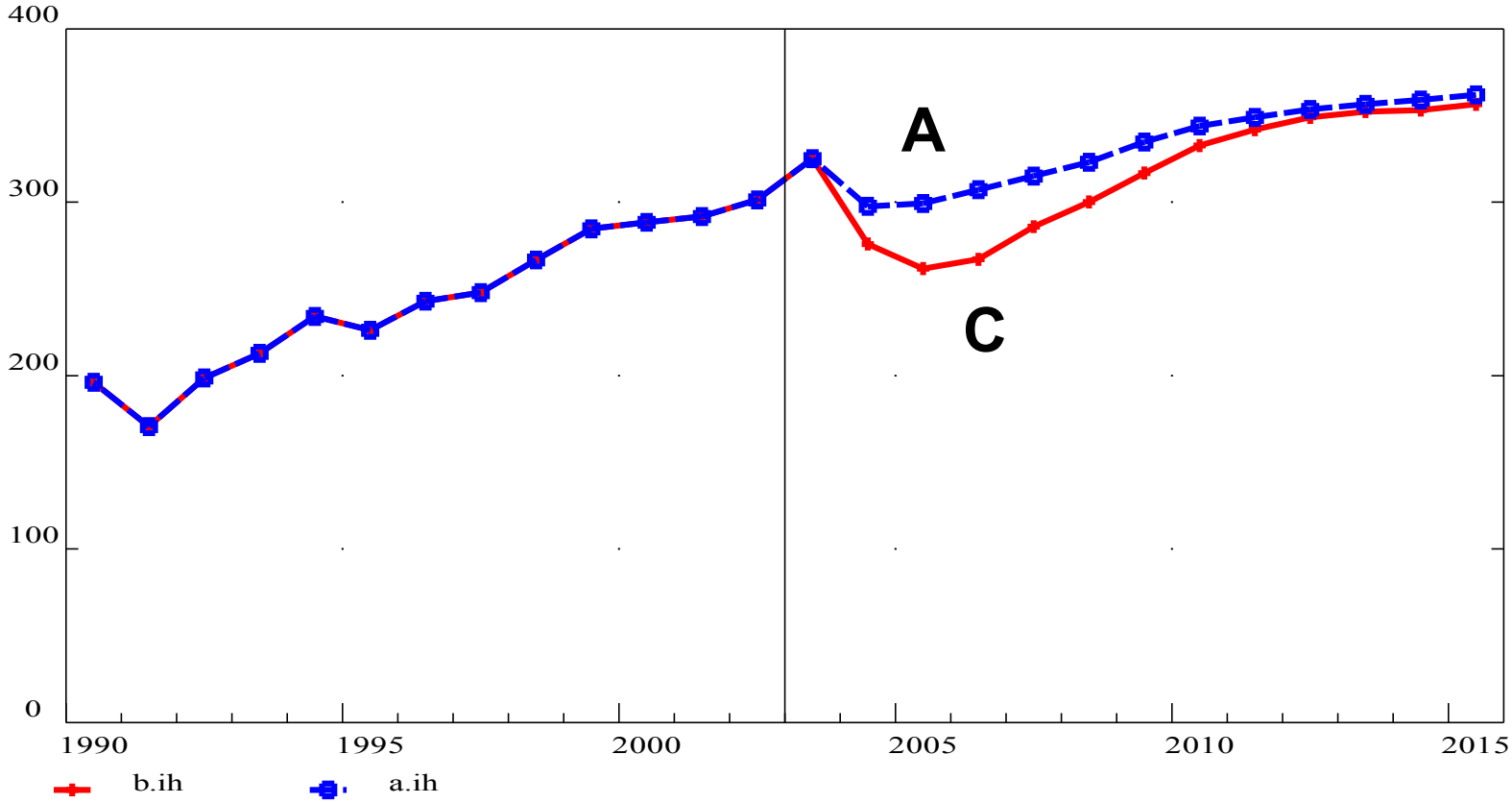
Economic Structure: PCE

(billions of 96$)



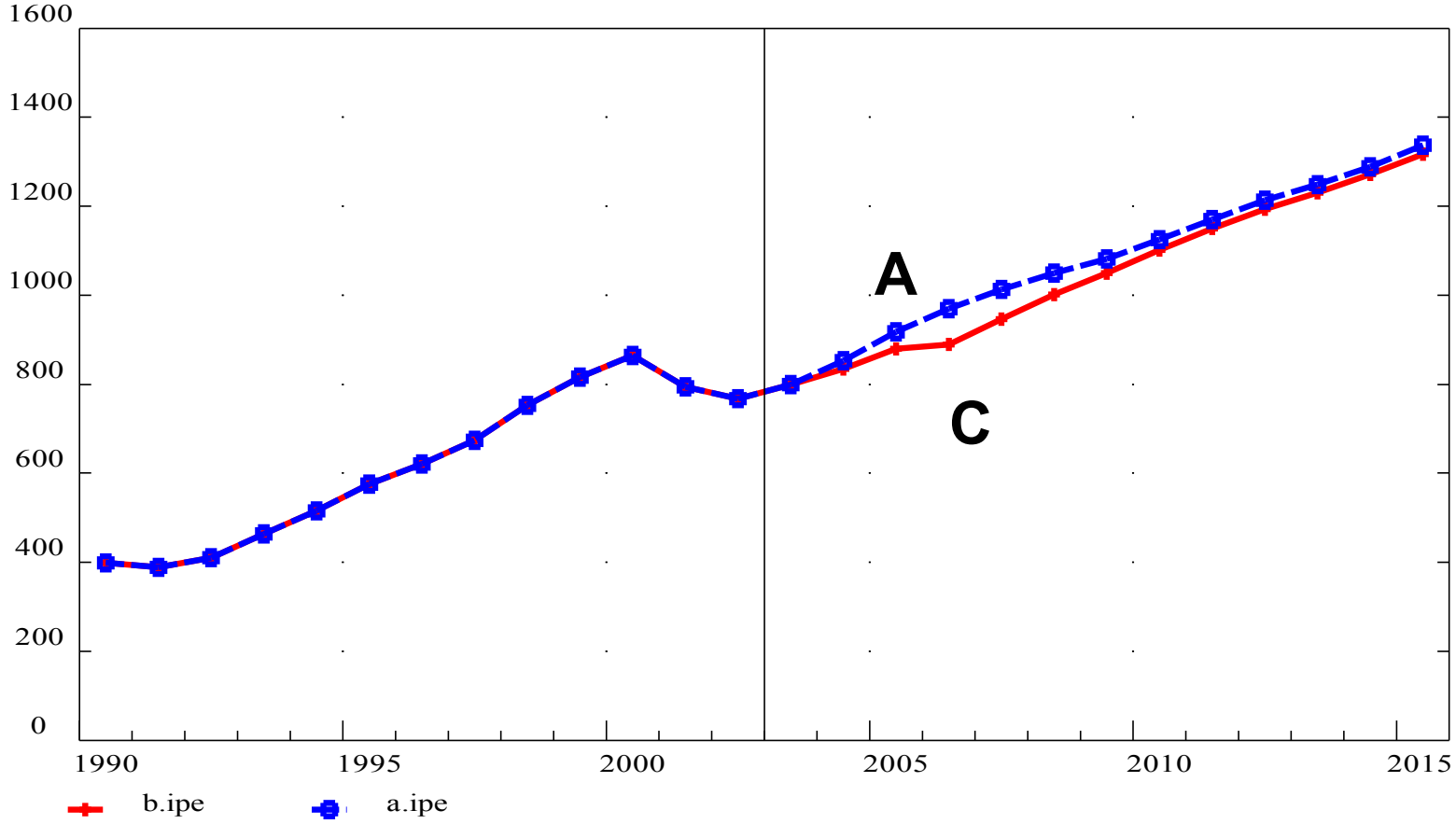
Economic Structure: Residential Investment

(billions of 96$)



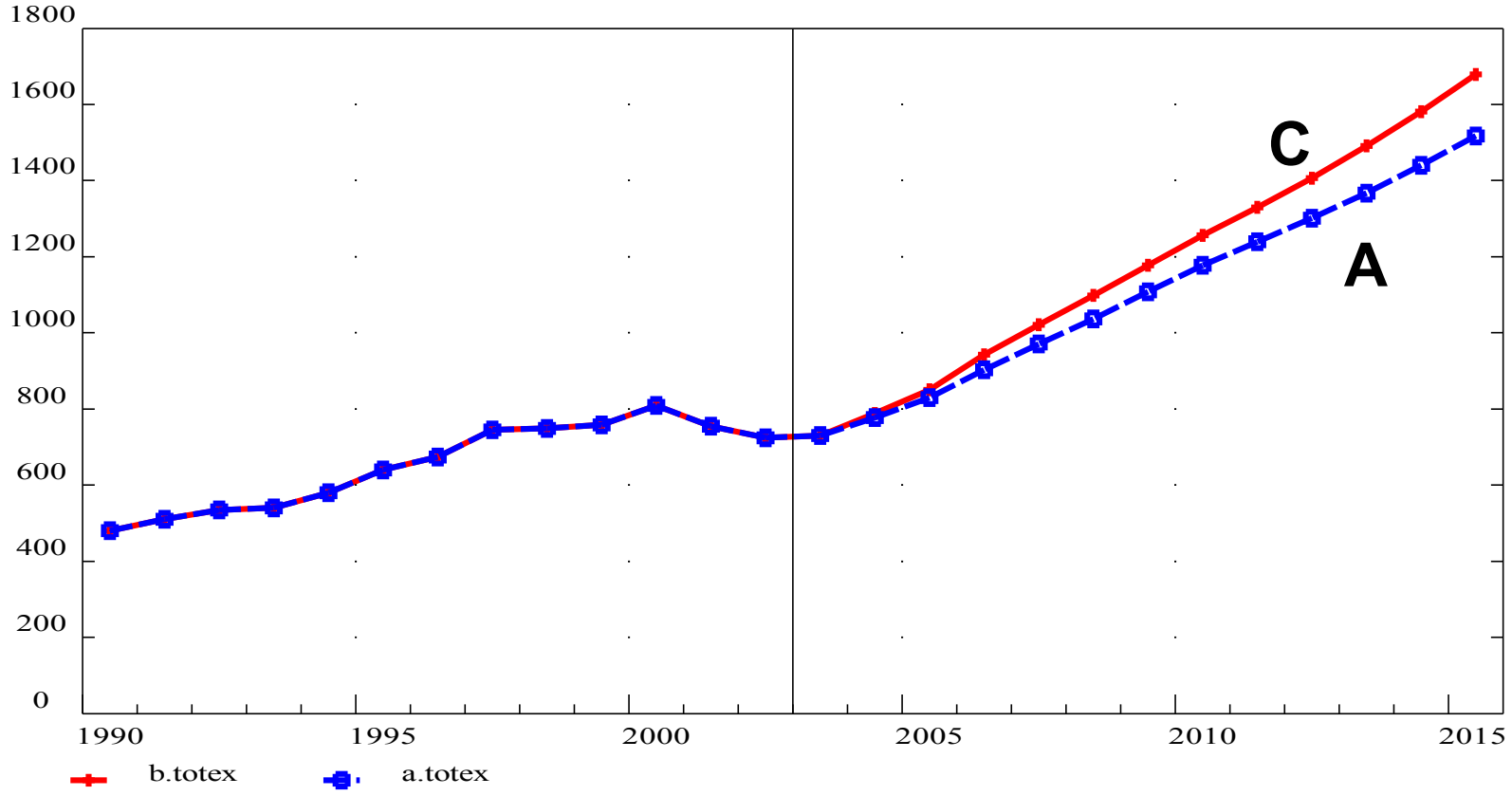
Economic Structure: Equipment Investment

(billions of 96$)



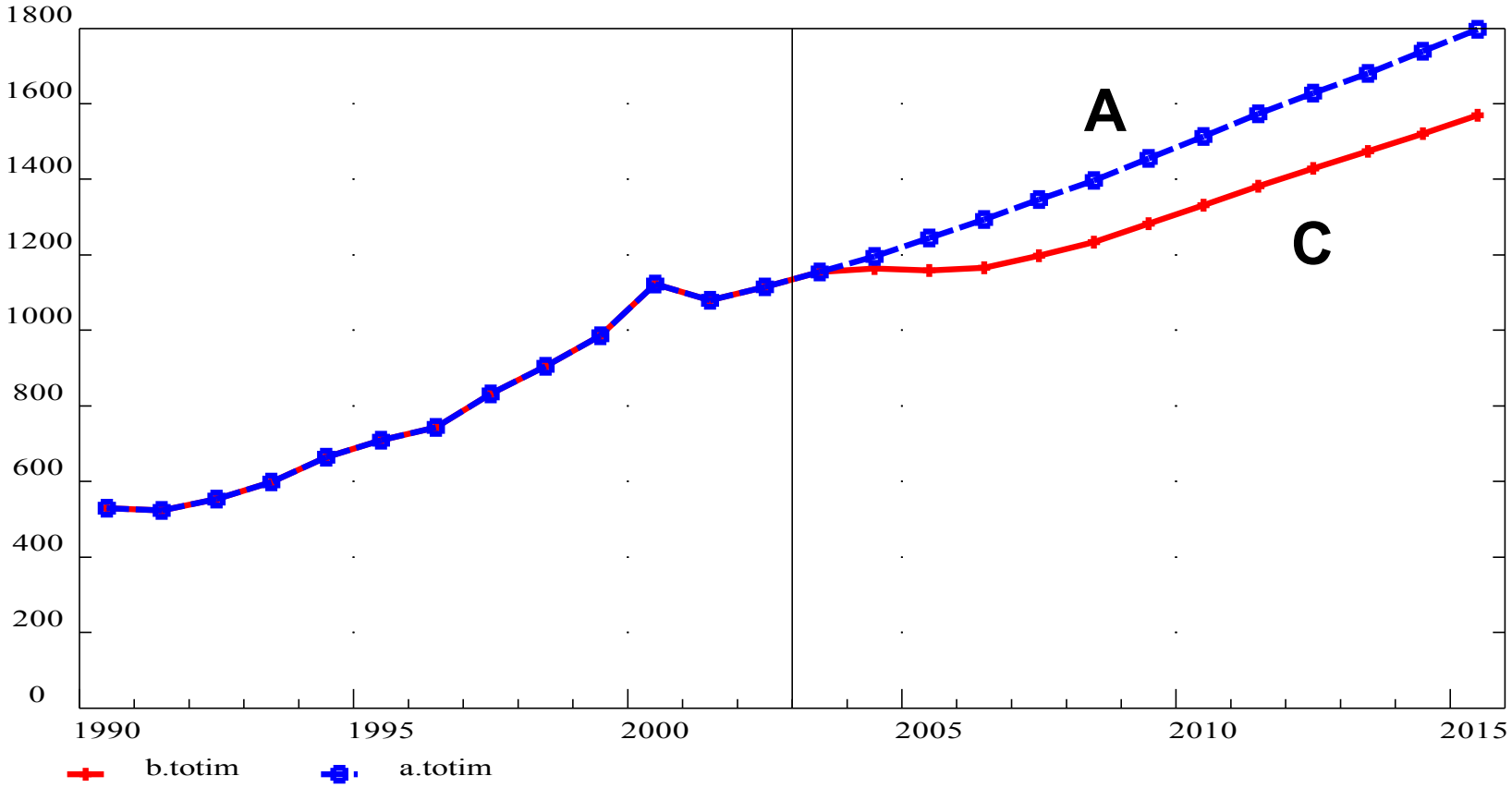
Economic Structure: Exports

(billions of 96$)



Economic Structure: Imports

(billions of 96$)



Industry Impacts: Winners and Losers

Output in Current Prices: Percentage deviation from base.
Line 1: Exchange rate shock only (B)
Line 2: Exchange and interest rate shock (C)

	2005	2006	2007	2010	2015
Agriculture, forest, & fish	1.5	2.8	3.1	3.3	4.3
	-0.2	0.5	0.3	-0.1	0.7
Mining	0.3	1.1	1.6	2.2	3.5
	-0.8	-0.6	-0.3	0.4	1.8
Construction	-1.5	-0.6	0.1	0.4	0.9
	-4.7	-5.4	-4.8	-3.1	-2.4
Non-Durable Manufacturing	1.1	2.8	3.6	4.9	7.1
	-1.5	-1.0	-1.0	-0.1	2.4
Durables	2.4	5.2	6.7	8.6	10.9
	-1.2	-0.3	0.7	3.5	6.2

Industry Impacts: Winners and Losers

Output in Current Prices: Percentage deviation from base.
Line 1: Exchange rate shock only (B)
Line 2: Exchange and interest rate shock (C)

	2005	2006	2007	2010	2015
Non-Electrical Machinery	1.9	3.6	5.4	7.2	9.6
	-1.4	-1.7	-0.4	3.3	5.6
Electrical Machinery	0.9	2.0	3.4	5.6	9.3
	-1.2	-1.2	0.1	3.2	7.2
Transportation Equipment	2.9	6.1	6.8	7.9	9.5
	-0.5	0.7	0.8	1.8	4.0
Instruments	4.0	6.6	8.8	11.8	15.1
	2.2	3.2	4.7	7.8	11.0

Industry Impacts: Winners and Losers

Output in Current Prices: Percentage deviation from base.
Line 1: Exchange rate shock only (B)
Line 2: Exchange and interest rate shock (C)

	2005	2006	2007	2010	2015
Transportation	0.4	1.6	2.0	2.7	4.1
	-1.8	-1.6	-1.8	-1.5	-0.1
Utilities	5.2	8.9	11.2	14.5	17.9
	3.0	5.1	6.7	10.0	13.3
Trade	-0.9	-0.3	-0.3	-0.5	-0.3
	-3.1	-3.4	-3.9	-4.8	-4.6
Finance, Insurance & Real Est	-1.3	-0.4	-0.6	-0.7	-0.5
	-4.6	-5.0	-5.8	-6.2	-5.6
Services	-0.4	0.0	0.1	0.1	0.3
	-2.5	-3.1	-3.7	-4.2	-4.0

Conclusions

- CA deficit is stubborn: large fall requires large dollar fall and expenditure reduction. Price lags & pass-through need further examination.
- Interest rate shock associated with realignment would be costly in short-term. There might be better ideas!
- Living standards loss is moderate (3-4%).
- Serial shocks require research. CA deficit reduction to 0.0 could create severe problems.
- Currency realignment produces structural changes.
- LIFT model data base does not have export prices and import prices come from BTM. Therefore, it is difficult to model current account. BTM and/or LIFT needs to produce nominal trade flows based on actual and specific export and import prices.