

# 英語で学ぶ国際金融

## Introduction to *International Finance*

伊藤隆敏

東京大学大学院経済学研究科教授

Takatoshi Ito

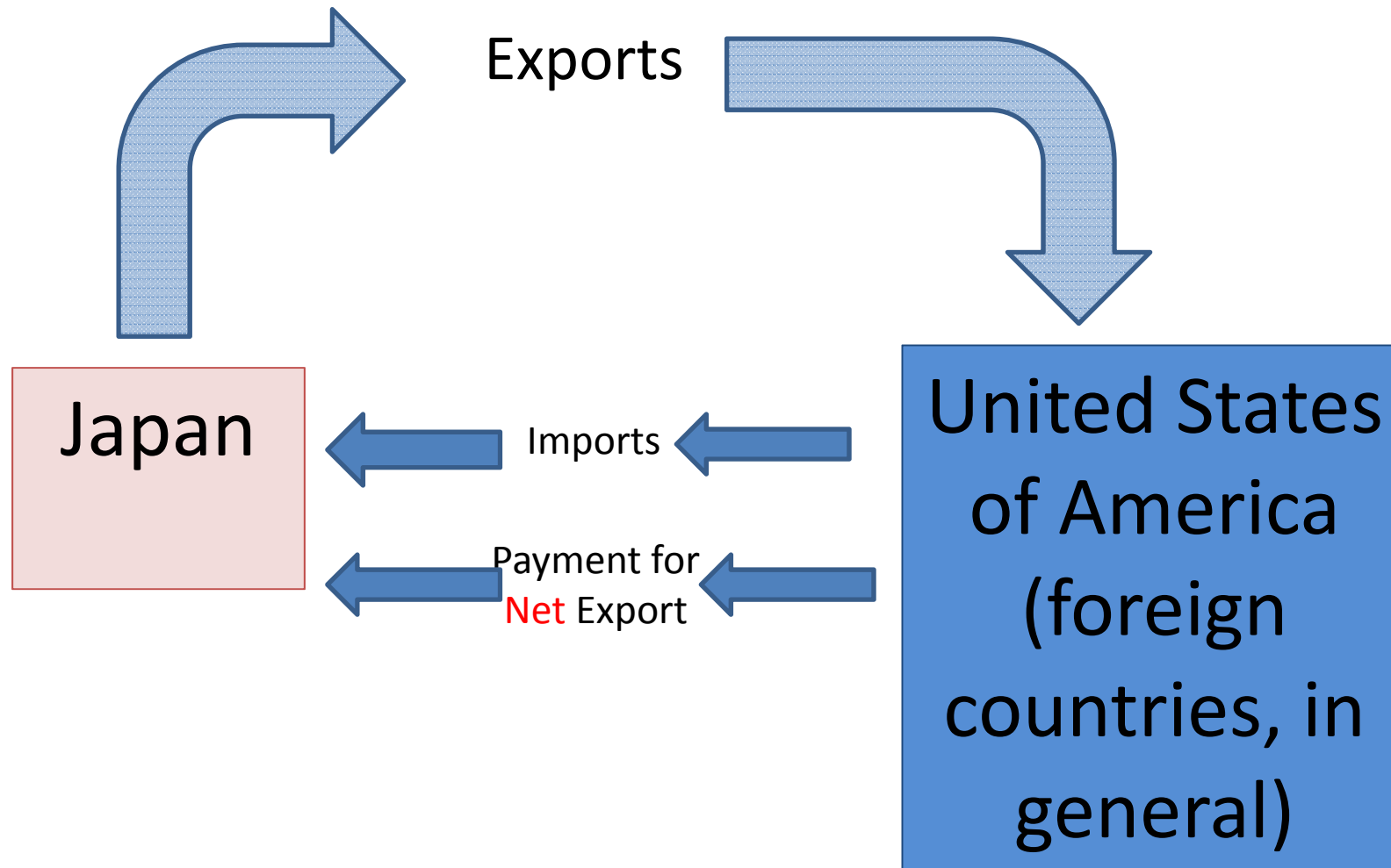
University of Tokyo

June 21, 2012

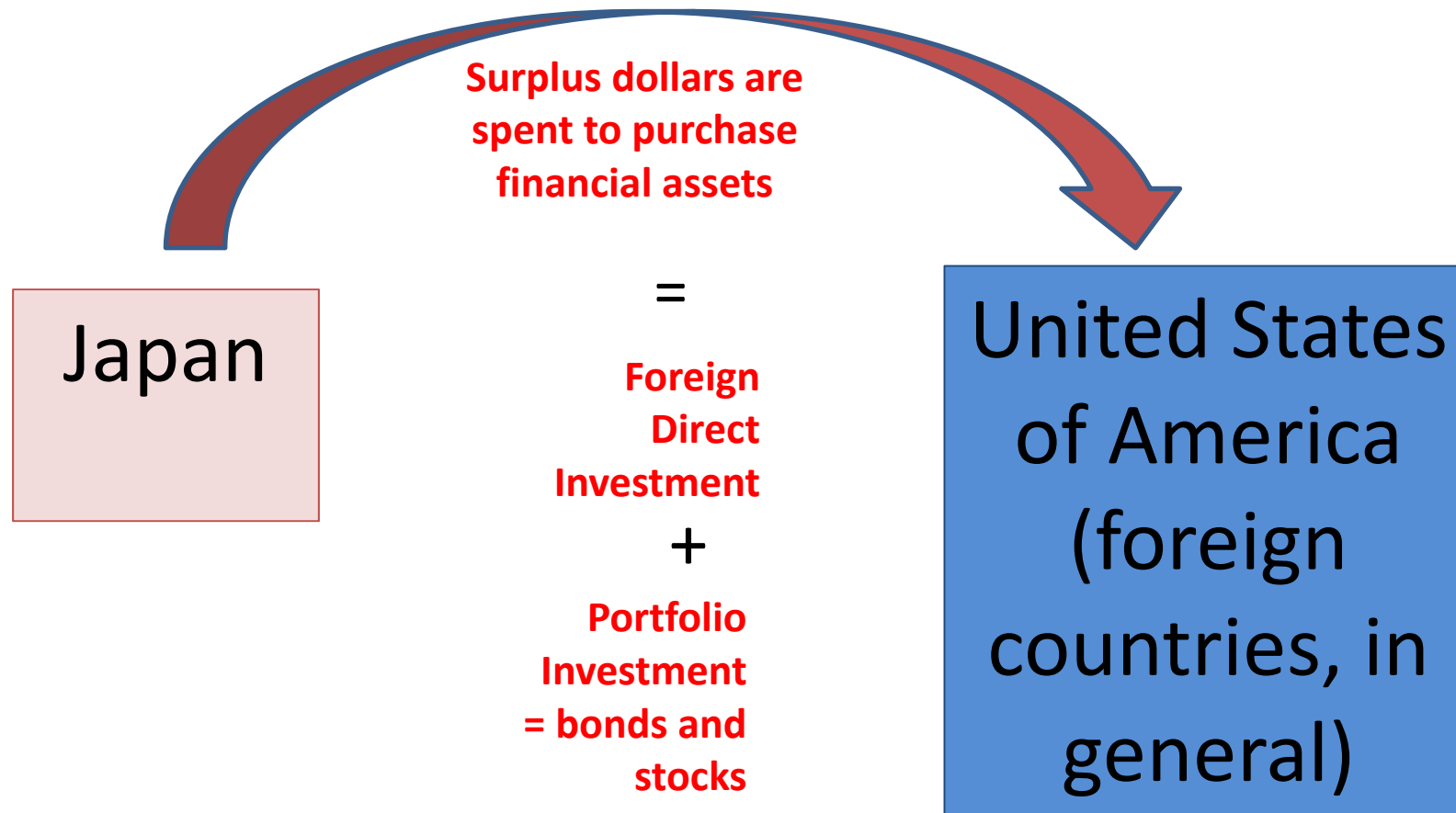
# What is *International Finance*?

- **Capital flows** (money, bond, equities) among countries
  - Which country borrow “capital” from which country?
  - Foreign reserves (accumulation of “intervention”)
- **Exchange Rate Movements**
  - Exchange rate: Relative prices between currencies
  - What determines the exchange rate?
  - What are impacts of the exchange rate changes on the economy?
  - History of the yen
  - Covered Interest rate parity

# Trade (net export) and Capital Flows

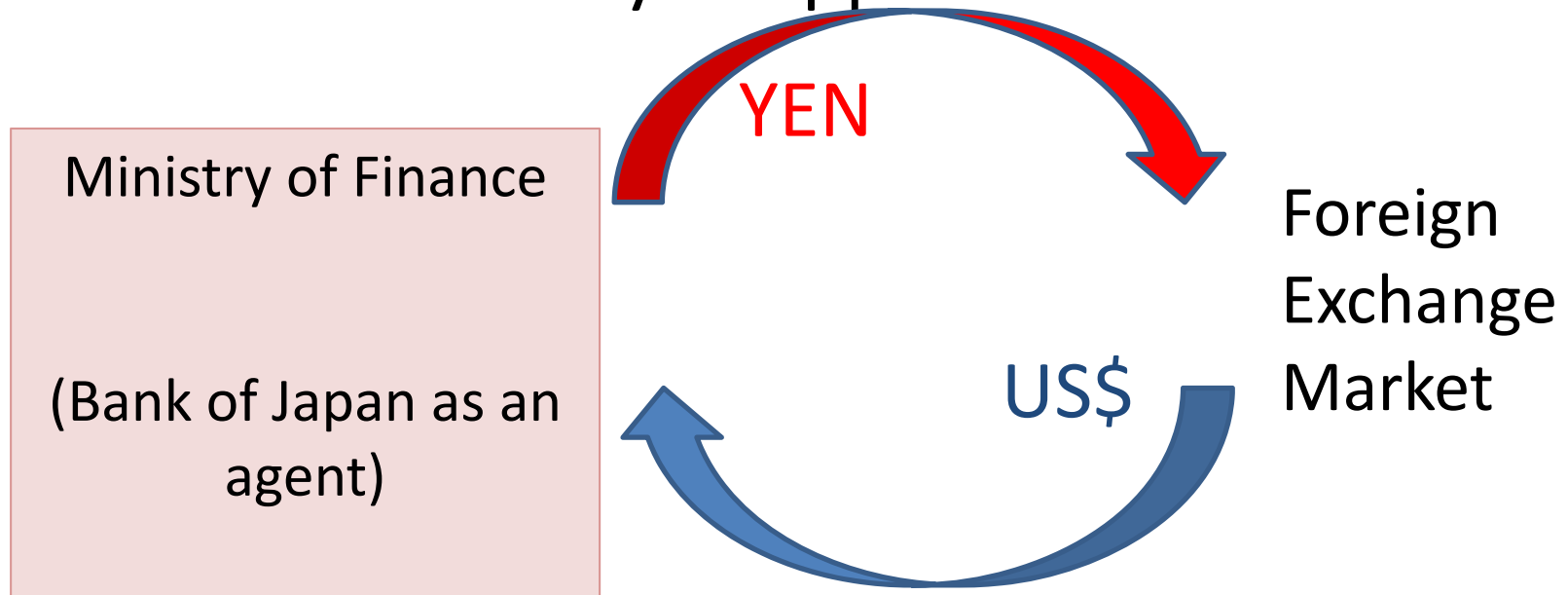


# Trade (net export) and Capital Flows

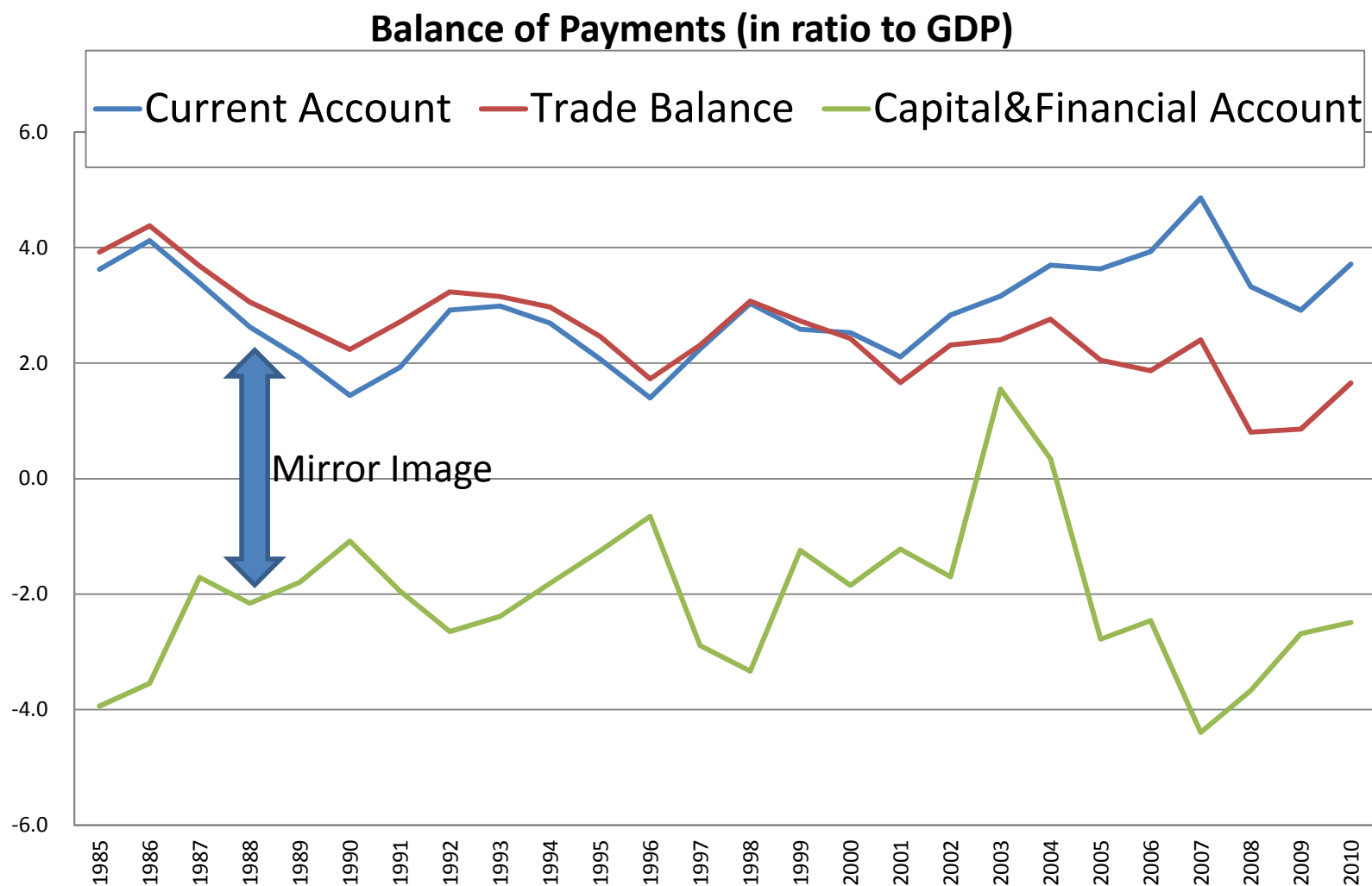


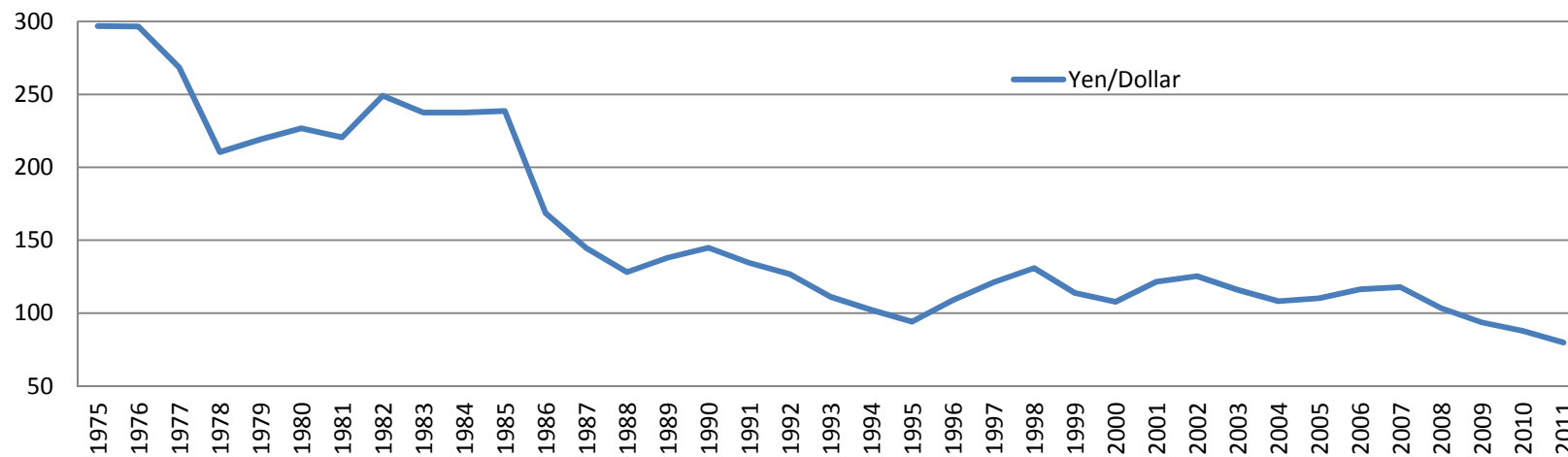
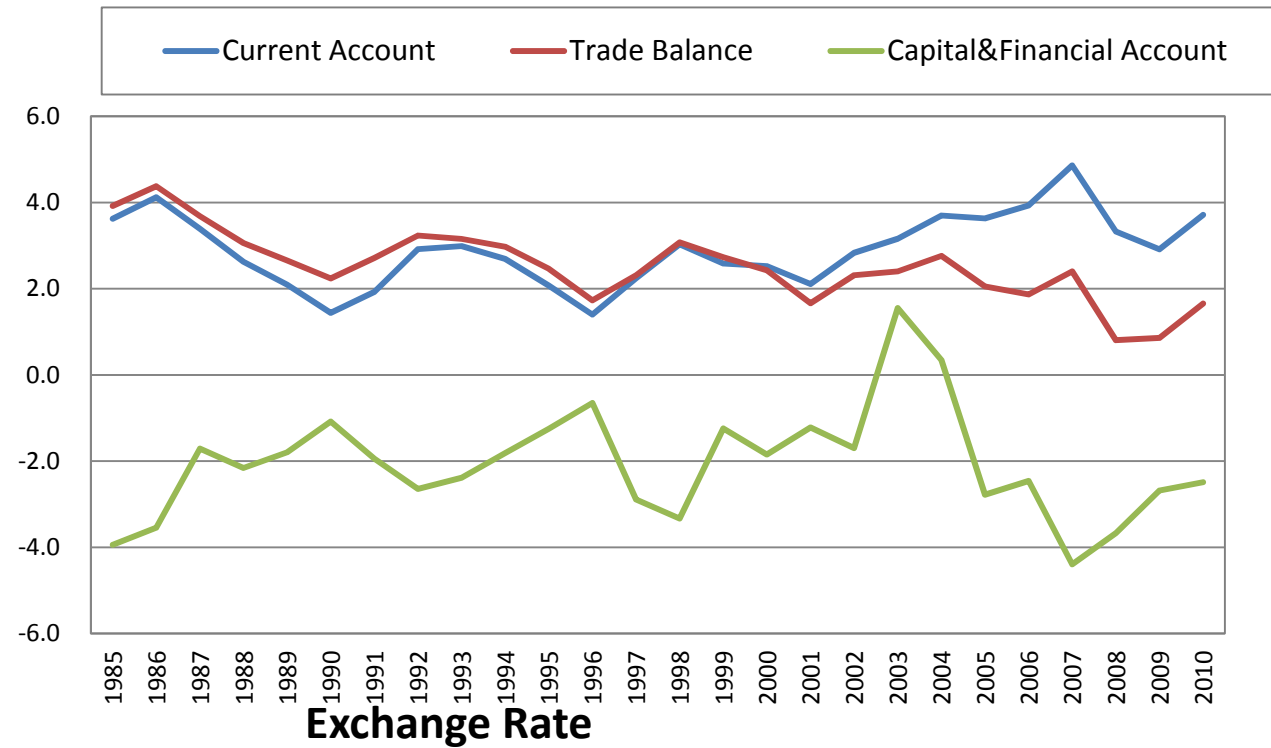
# Intervention (介入)

- Monetary authorities (Ministry of Finance or central bank) sometimes “intervenes” in the market. For example, the Japanese MOF buys US dollar by selling the Japanese yen to prevent “too much yen appreciation”



# Current Account and Capital Account





# What is the Exchange Rate

- Dollar/Yen exchange rate.
  - Relative price of two currencies
  - For example, 1 USD = 100 JPY
- Yen appreciation and depreciation
  - **Appreciation**: Yen becomes more valuable (per USD)
  - **Depreciation**: Yen become less valuable (per USD)
  - (Similar words: Revaluation and Devaluation, when the rate is changed under the fixed exchange rate regime)
- (Q) Suppose that the dollar/yen exchange rate changes from 1 USD = **100 JPY** to 1 USD = **80 JPY**,
  - Is it **appreciation or depreciation?**



# Exchange Rates (June 21, 2012)

<http://quote.yahoo.co.jp/m3>

レート表

	JPY	USD	AUD	GBP	CAD	CHF	EUR
外国為替 レート	日本円 ---	<a href="#">米ドル</a> 8:09	<a href="#">豪ドル</a> 8:09	<a href="#">英ポンド</a> 8:09	<a href="#">カナダドル</a> 8:09	<a href="#">スイスフラン</a> 8:09	<a href="#">欧州ユーロ</a> 8:09
日本円	1	79.440000	80.925528	124.800240	77.920549	83.885956	100.785528
米ドル	0.012588	1	1.018700	1.571000	0.980873	1.055966	1.268700
豪ドル	0.012357	0.981643	1	1.542162	0.962867	1.036582	1.245411
英ポンド	0.008013	0.636537	0.648440	1	0.624362	0.672162	0.807575
カナダドル	0.012834	1.019500	1.038565	1.601635	1	1.076558	1.293440
スイスフラン	0.011921	0.947000	0.964709	1.487737	0.928887	1	1.201459
欧州ユーロ	0.009922	0.788208	0.802948	1.238275	0.773132	0.832321	1

※ロイタージャパンのデータを計算して10分か20分遅れで表示しています

# USD/JPY, 2002-2012 (10 years)

America Dollar

2012/6/19



(C) 2012 Yahoo Japan Corporation.

<http://stocks.finance.yahoo.co.jp>

# 2011-2012, one year

America Dollar

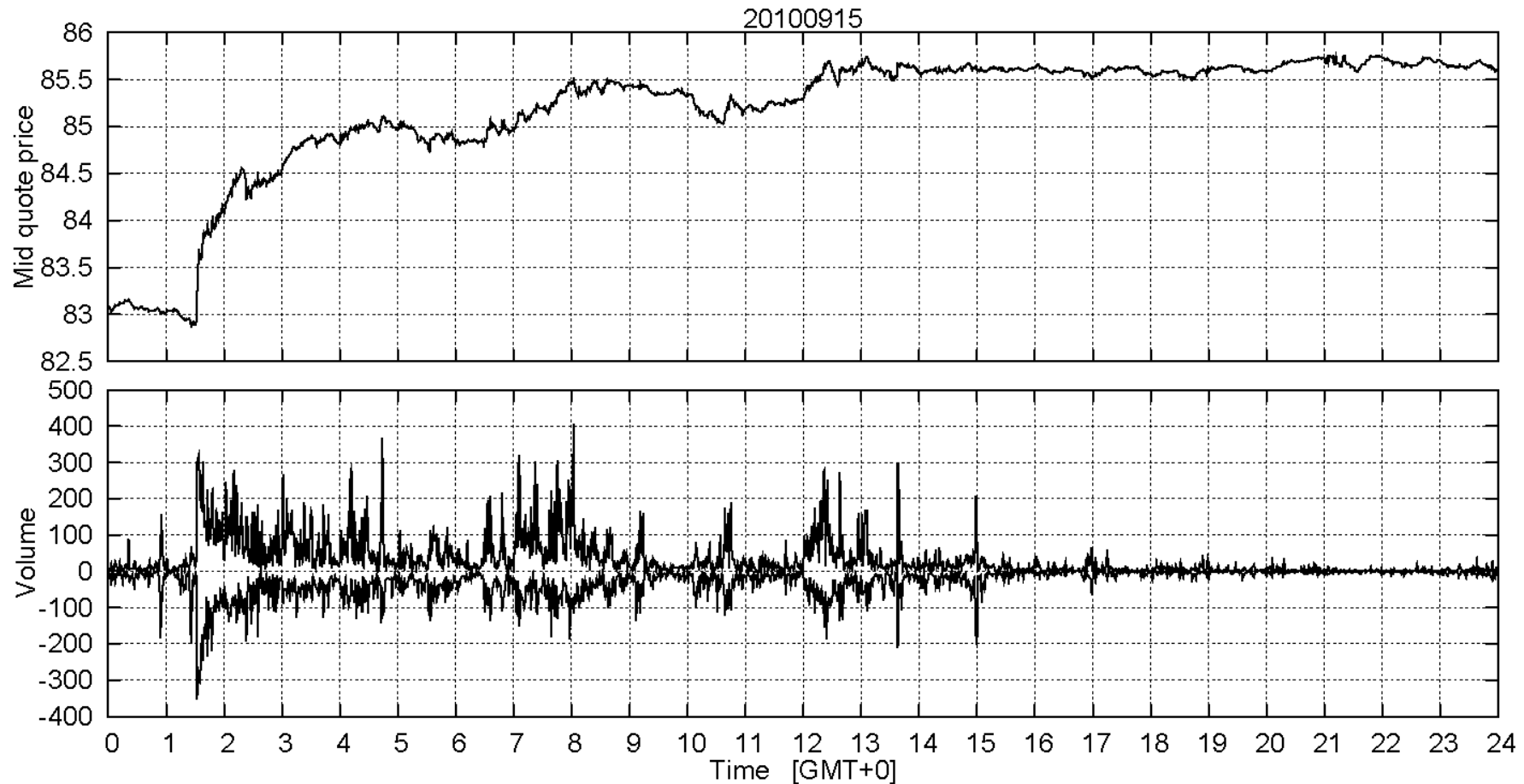
2012/6/19



(C) 2012 Yahoo Japan Corporation.

<http://stocks.finance.yahoo.co.jp>

# tick-by-tick data, Sept 15, 2010



(Q) What do you think caused the  
jump from GMT 1:30 (=JST 10:30) ?

© Takatoshi Ito

# Bid and offer

At 8:49AM today,

Spot 79.470000

79.470000 買気配 (bid) .

79.500000 売気配 (offer = ask) .

That means, some bank is willing to buy USD (for yen) at 79.47

Some bank is willing to sell USD (by yen) at 79.50

A customer comes to bank A and sell USD 1 million to BANK A (bank A buys USD) at 79.47;

another customer comes to bank A and buys the USD 1 million from the bank (Bank A sells USD) at 79.50

The bank sold 1 million and bought 1 million, and made profits of  
 $0.03 \times 1\text{million}$  , 30,000 yen.

Note that the bid-ask difference will be the source of profit of the bank

Note that this is the “interbank” rate (bank to bank); the bid-ask spread for “customer” is much wider.

# Spot, Forward, Futures & Customer and inter-bank

- Spot
  - Immediate exchange of two currencies
    - Customer transactions
    - Interbank transactions
- Forward
  - Contract of transaction at the contract rate in the future dates:  
No transaction until the transaction date
    - Good for hedging of exporters and importers
    - E.g., Toyota wants to make the receipt of export earnings in three months fixed in the yen now → ask a bank to be counterparty
- Futures
  - Contract of transactions at the end of contract period
  - However, there are “margin” payments along the way
  - Can be “hedge” but can be “speculation”

# Exchange Rate changes

- What determines/changes the exchange rate?
- What are impacts of the exchange rate changes on the economy?
- History of the yen
- High-frequency change of the exchange rate

# Determinants of the exchange rate

## Relative price of goods or asset price?

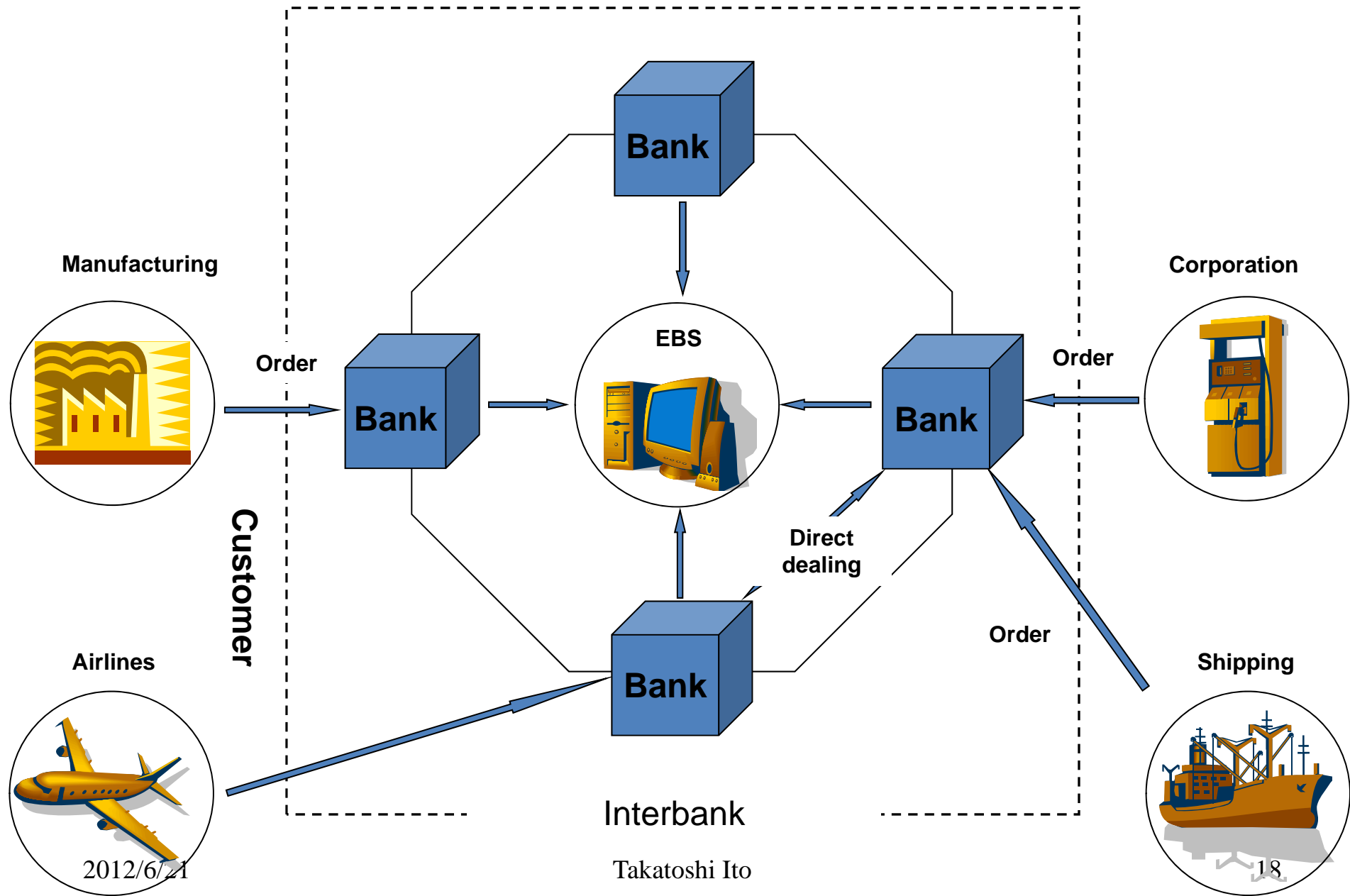
- Long-run
  - [PPP] Prices differential; Real exchange rate is stable in the long run
  - Real exchange rate does change over time; productivity differential
- Medium-run
  - Interest rate differential
  - Prospect of asset price increase/decrease (= asset investment)
  - Trade balance (Current account)  $\leftrightarrow$  Exchange rate
- Short-run
  - Basically “random walk”
  - “Safe” vs. “risk” (high-risk-high-return)
  - Expectations on policy change
  - Expectations about other investors  $\rightarrow$  self-fulfilling prophecy
  - New information on economic conditions
  - Interventions
- Overtime, the aspect of asset portfolio investment is increasing
- (Q) Will an announcement of “higher than expected unemployment rate” cause appreciation or depreciation in the market?



# Foreign Exchange Market

- (Q) Is there a “market” like a place where people get together to trade?
- 24 hour trading
- Three major centers: Tokyo, London, New York
- Major currencies: USD, EUR, JPY, GBP,
- Spot market. Now sellers and buyers are matched by computers

# Foreign Exchange Market



# Market participants

- Interbank (Computers)
  - Bank Dealer
  - Securities firms
  - (recently) hedge fund
- Real money managers vs. leveraged investors
  - Trading firms (商社)
  - Institutional investors
    - Pension funds
  - Proprietary trading of investment banks
  - Hedge funds
  - Individuals

# Exchange rate → Economy

- (Q) Why do exporters complain when the yen appreciates?
  - Profit margin shrinks, if export prices cannot be raised.
  - Why cannot exporters raise prices when yen appreciates?
- (Q) But, how about importers? Don't they benefit for cheaper imports?
  - Of course, yes.

# Purchasing Power Parity (PPP)

- Variables

S、USD/JPY,

S=100yen per dollar

P、Japanese price, e.g.,

Coffee= 500Yen

P\*、US price,

Coffee = \$5

- Absolute PPP

$$S=P/P^*$$

(Example satisfies this)

Law of One Price

Theoretically, this is not necessarily true. Transportation costs, transportation time, heterogeneity (but If Starbucks, coffee is the same), Competition conditions, etc may prevent PPP

# Absolute PPP and Relative PPP

- Law of One Price (absolute PPP) cannot hold for all the goods and services. Some goods are more expensive in Japan than in the US, and others are less expensive in Japan than in the US. We need an average of price levels.
- How about using Consumer Price Index (CPI) of Japan, and CPI of US?
- Yes, but CPI is an index (with some base year). Only the change from year  $t$  to  $t+1$  has meaning, not the absolute level.
- So, one can compare the changes of CPI (Inflation) in two countries and the change of the exchange rate (appreciation and depreciation)
- **Relative PPP:  $\Delta \ln S = \Delta \ln P - \Delta \ln P^*$**
- Note:  $\Delta \ln S = \ln S(t) - \ln S(t-1)$ , where  $\ln$  is natural logarithm
- Again, the high inflation country tends to have depreciation

# Two ways to use PPP

- 1. [Inflation differential determines the exchange rate, in the long run]

$$P, P^* \rightarrow S$$

E.g., High inflation countries tends to experience depreciation of its currency

- 2. [The PPP exchange rate can be defined and compared to the market exchange rate]
  - PPP does not hold all the time for quality differences and transportation costs.
  - PPP cannot hold for all goods and services, since relative prices are different in different countries.
  - Compare

# The PPP exchange rate

- PPP Exchange rate, What is it?
- For the same commodity, **what is the exchange rate that equates the prices in two cities (countries), i.e., to make PPP hold?**
- Easy to do for homogeneous goods, like Starbucks, MacDonald
- Extend the concept to a basket of goods, and calculate the PPP exchange rate. Summers-Heston (World Bank) Index.
  - For example, China's price levels (food, clothing, taxi, etc) are in general low compared to the US at the market rate. Then, the "PPP exchange rate" of RMB vis-à-vis USD is more appreciated than the market rate.
  - But, are all the goods and services in the consumption basket in the US available in China?



## Question

- Starbucks, Café Latte Tall, 380 yen
- London City Starbucks, GBP 1.85
- What is the PPP exchange rate for Starbucks café latte?
- Compare the PPP exchange rate to the current market rate today, 125 yen = GBP 1.
- Similar exercise is done by *Economist*, over Big Mac of McDonald every year

# Big Mac Index, by *the Economist*

- **The Big Mac index**
- Feb 1st 2007, From Economist.com
- *The Economist's* Big Mac index is based on the theory of purchasing-power parity (PPP), according to which exchange rates should adjust to equalise the price of a basket of goods and services around the world. Our basket is a burger: a McDonald's Big Mac.
- The table below shows by how much, in Big Mac PPP terms, selected currencies were over- or undervalued at the end of January. Broadly, the pattern is such as it was last spring, the previous time this table was compiled (see article). The most overvalued currency is the Icelandic krona: the exchange rate that would equalise the price of an Icelandic Big Mac with an American one is 158 kronur to the dollar; the actual rate is 68.4, making the krona 131% too dear. The most undervalued currency is the Chinese yuan, at 56% below its PPP rate

# History of the Yen

# The Yen

- Long-run movements, 1871-2007
  - Birth of the yen 1871
  - Silver standard to gold standard (1897)
  - Struggle to restore gold standard after WW I
  - Briefly back on gold 1930-31
  - Great depreciation, 1931-32
  - Summary 1871-1939, depreciation from 1:1 to 4:1
  - After WW II
  - Why 360 yen/dollar, Role of PPP
  - Ballassa – Samuleson holds, 1949-1990
- Takatoshi Ito, “The Exchange Rate in the Japanese Economy: the Past, Puzzles, and Prospects,” ***Japanese Economic Review***, vol. 56, no. 1, March 2005: 1-38.

# History, birth of the yen

- 1868, Meiji Restoration (new civil government)
- 1871 (May 1), New Currency Act
  - Approx. 1 yen = 1 USD
  - Declare gold standard
  - At trade ports, Mexican Silver Dollar convertible
- 1884, the Bank of Japan is given the status of sole note issuing bank.
- 1885, BOJ issued a (silver convertible) note, de facto Silver-convertible

# Gold standard (1)

- 1897, Gold standard adopted.
  - Gold acquired as a result of Sino-Japanese war, worth 300 million yen, 3 times the annual budget
  - 100 yen =  $49\frac{7}{8}$  dollars or
  - 1 yen =  $2\frac{9}{16}$  Shilling
- Gold standard lasted until 1917, following the US
- US back on the gold standard, 1919
  - European countries and Japan could not get back on the gold standard immediately.

# Gold standard (2)

- During the 1920s, the European countries went back on gold at “old parity”
- Japan struggled to get back on gold
  - Efforts hampered by the Great Kanto Earthquake, in 1923
  - Banking Crisis in 1927
- 1929, July 2, Democratic government took over. New Finance Minister, Junnosuke Inoue, moved to restore the gold standard at old parity (the same mistake of the Great Britain).

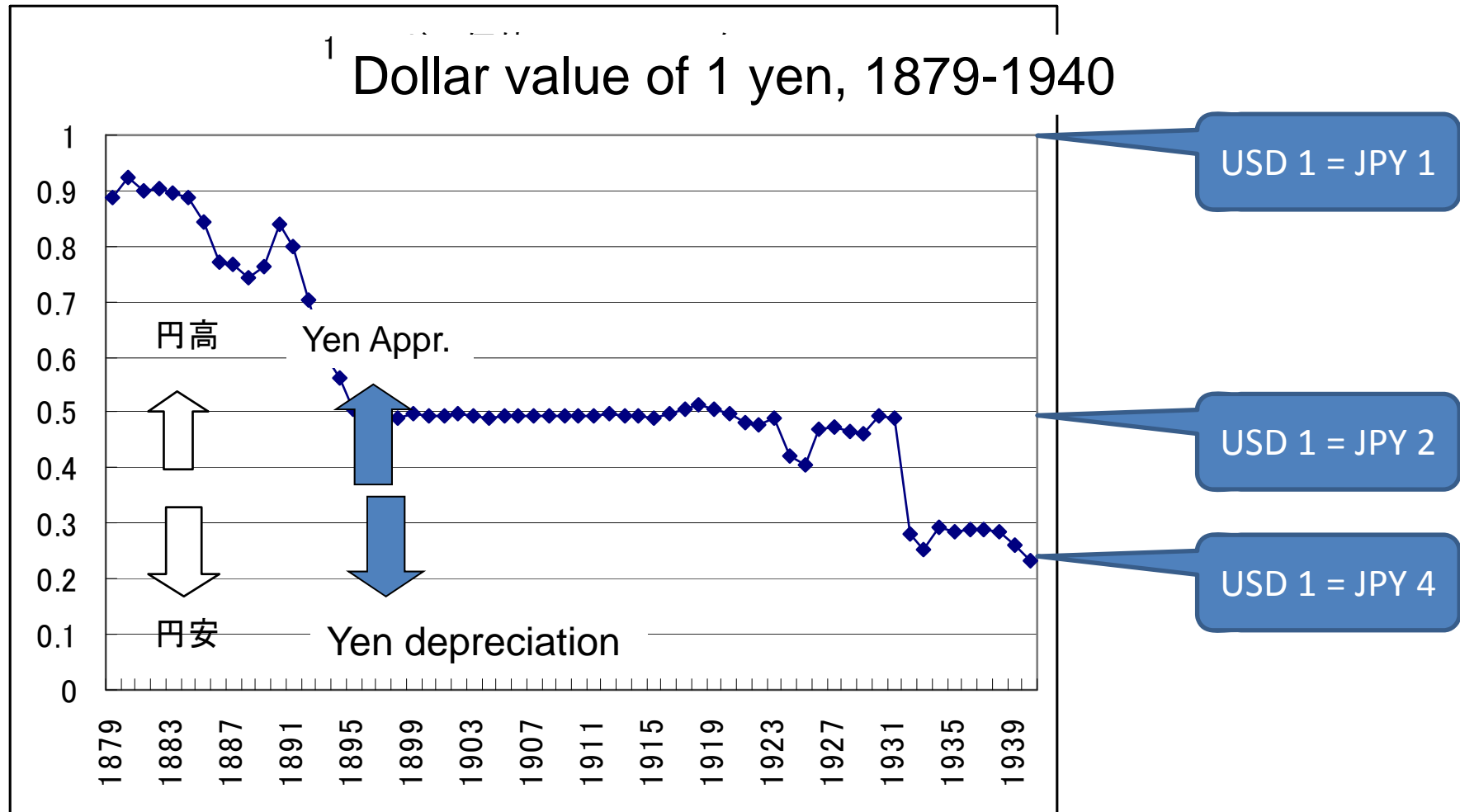
# Gold standard, on and off

- January 1930, Gold standard at old parity
  - 100 yen = USD 50
- Recession, stock price declines, commodity price declines—deflation
- Sept-Oct 1931, European countries went off gold
- December 1931, Japan went off gold
- Great depreciation,
  - Went quickly to 100 yen = USD 25
  - Takatoshi Ito, Kunio Okina, and Juro Teranishi, "News and the Dollar/Yen Exchange Rate, 1931-33: The End of the Gold Standard, Imperialism, and the Great Depression", JJIE, vol. 7, no. 2, June 1993, 107-131.
  - Helped Japan to recover from the recession by export promotion




# Nominal JPY/USD

<sup>1</sup> Dollar value of 1 yen, 1879-1940



# The yen after WW II

- 1945, End of the war
  - The economy (productive capacity) was devastated
- 1946-1949
  - Hyper inflation, more than 200% per annum. Not quite as bad as the Hun~~g~~ian hyperinflation
  - Multiple exchange rates (different rates for different merchandize, imports and exports)
- 1949, April 23
  - Unify the exchange rate; set JPY 360=USD 1
  - Cut budget deficits
- Success of the policy later known as “Exchange rate based stabilization program”—known as “Dodge Line”
- Help from exports surge due to the Korean war of 1950

# The Bretton-Woods Regime

- The Allied nations (winning coalition) had planned on the international trade and financial architectures in Bretton-Woods, NH, on July 1-22, 1944.
- The **United Nations Monetary and Financial Conference**, commonly known as the **Bretton Woods conference**, was a gathering of 730 delegates from all 44 Allied nations at the Mount Washington Hotel, situated in Bretton Woods, New Hampshire,
- Agreements were signed to set up the International Bank for Reconstruction and Development (IBRD), the General Agreement on Tariffs and Trade (GATT), and the International Monetary Fund (IMF).
- As a result of the conference, the Bretton Woods system of exchange rate management was set up, which remained in place until the early 1970s

# Mt. Washington Hotel, Bretton Woods, NH



© Takatoshi Ito



IN THIS ROOM THE ARTICLES OF  
AGREEMENT SETTING UP THE  
INTERNATIONAL MONETARY FUND  
WERE SIGNED IN JULY, 1944

© Takatoshi Ito





© Takatoshi Ito

# Keynes vs. White

- Keynes proposed to have International Clearing Union (ICU), just like an international central bank, to settle trade surpluses and deficits. It issues “bancor” an international currency, exchangeable with national currencies.
- Harry Dexter White (US) opposed "We have been perfectly adamant on that point. We have taken the position of absolutely no." He instead proposed International Monetary Fund (IMF) and World Bank (IBRD)
- White won and Keynes lost

# Why 360 yen/dollar?

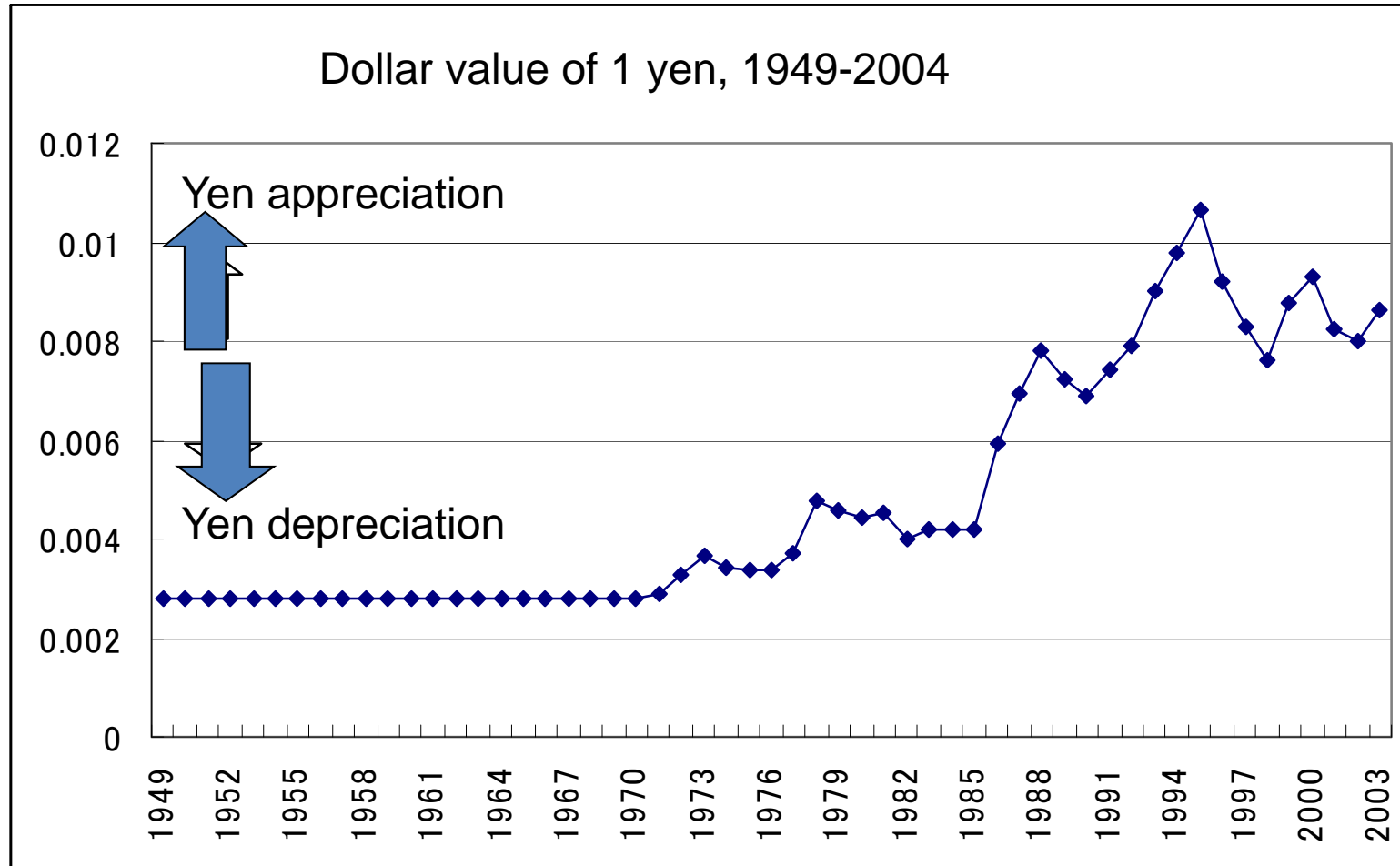
- The committee to decide the exchange rate tried to estimate the PPP exchange rate. Some members insisted 330, the Japanese side insisted 400.
- The compromise 360.
- But, 4 yen (prewar) → 360 yen (postwar) was close to the difference in inflation rates (especially the hyperinflation in Japan in 1946-49. PPP !
- USD1=360 yen held from 1949-Aug 1971
  - What the fixed exchange rate supposed to work—break on the economy when the boom ended in trade deficits
  - Moderate inflation > US inflation → Real appreciation
  - Balassa-Samuelson effect worked through inflation differential



## End of Bretton-Woods and a sharp appreciation

- August 1971. End of 360 yen/dollar
- December 1971. Smithsonian Agreement,
  - 308 yen/dollar (16% appreciation, IMF)
- February 1973. Free float.
- Appreciation trend continues until 1995
  - Balassa-Samuelson effect worked through nominal exchange rate appreciation
- Peak, 79.75 yen/dollar in 1995

# Nominal appreciation of the yen



# The yen movement, 2005-2011

Yen/\$, 2005/01/02 - 2011/6/30

