

Japanese Economy since 1990

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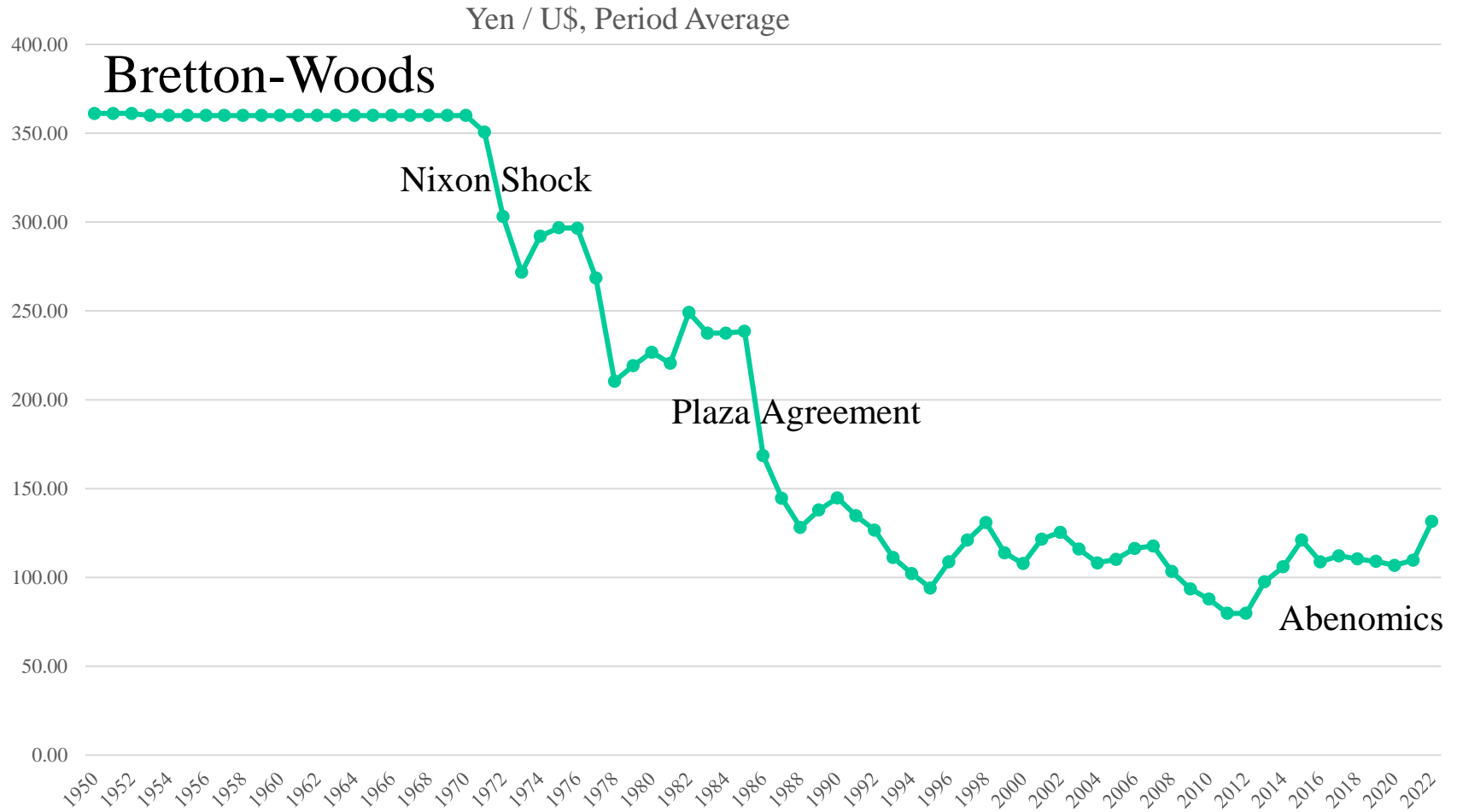
Japan in 1980s

- Japanese economy was highly acclaimed as “No.1” by western intellectuals in late 1980s.
- The argued that Japan presented an alternative model of capitalism, which is distinguished from North American or European Capitalism.

The Lost Decade

- The bubbles in the stock and real estate markets in the late 1980s crashed in the early 1990s.
- Since 1990 Japanese economy suffered from a more than decade long recession until recently.
- The lost 90s were characterized by low inflation and low interest rate.

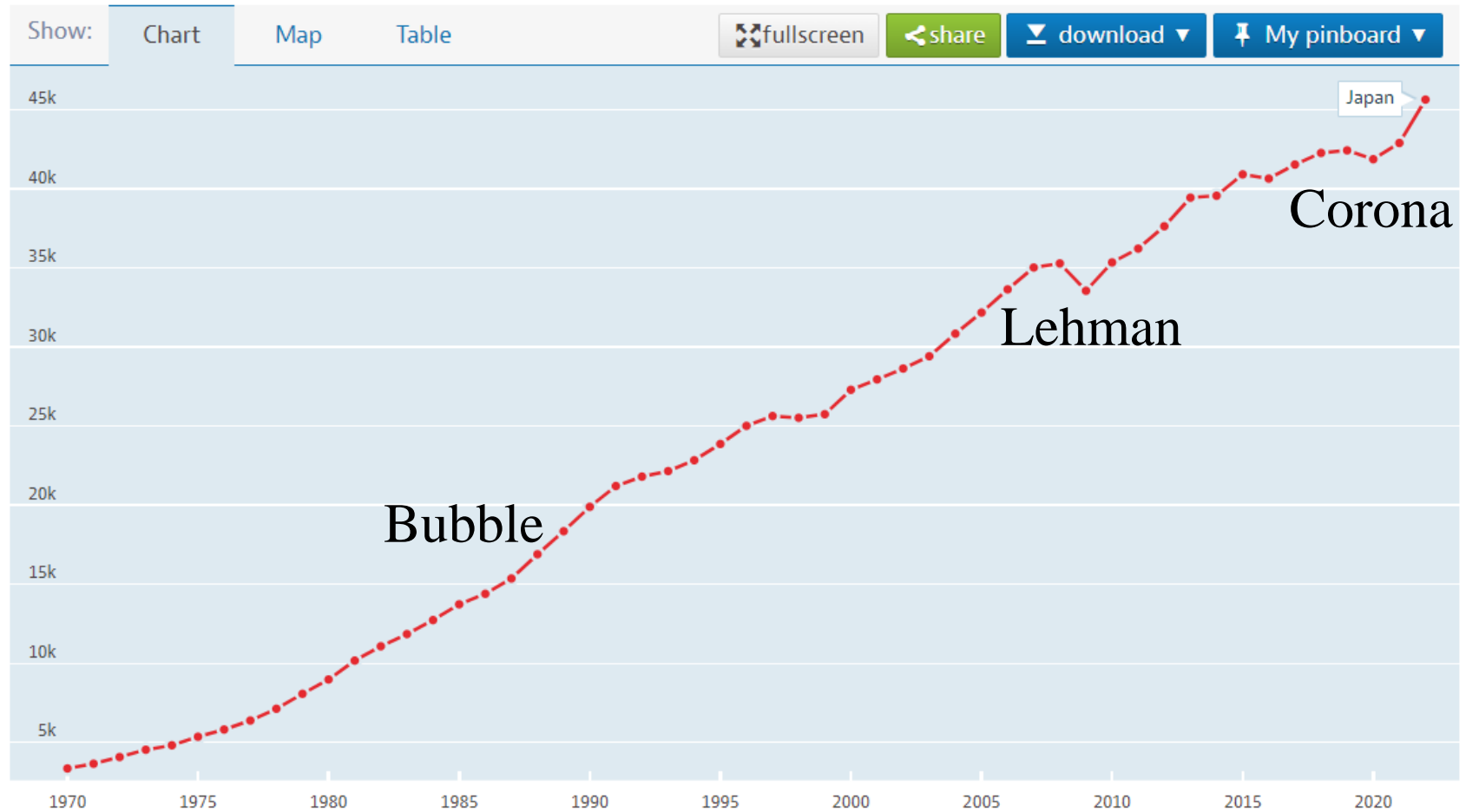
The Yen has appreciated in the last 70 years



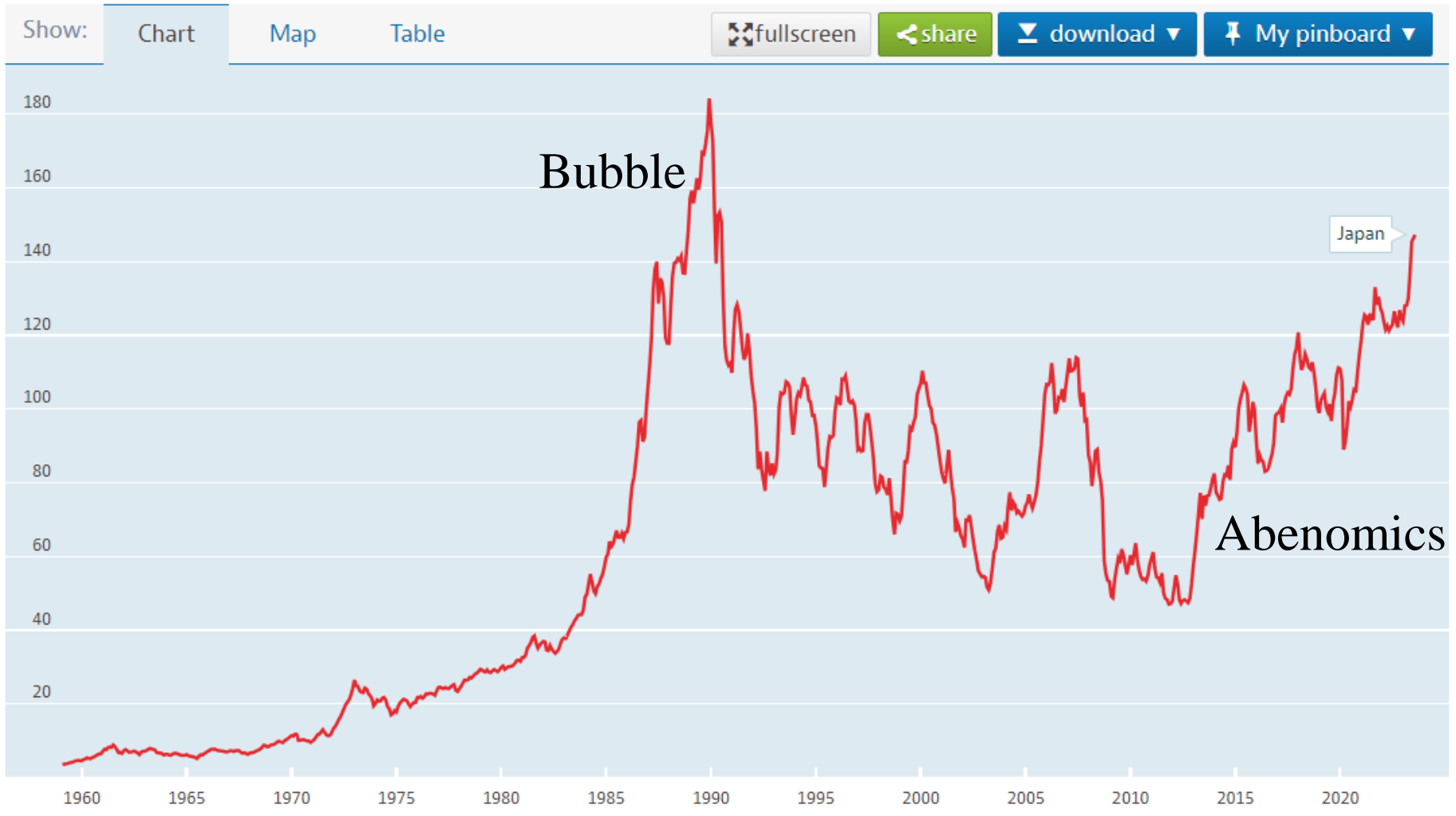
<https://data.imf.org/regular.aspx?key=61545850>

Japan's economy has been growing steadily.

Gross domestic product (GDP) Total, US dollars/capita, 1970 – 2022 Source: Aggregate National Accounts, SNA 2008 (or SNA 1993): Gross domestic product



<https://data.oecd.org/gdp/gross-domestic-product-gdp.htm>

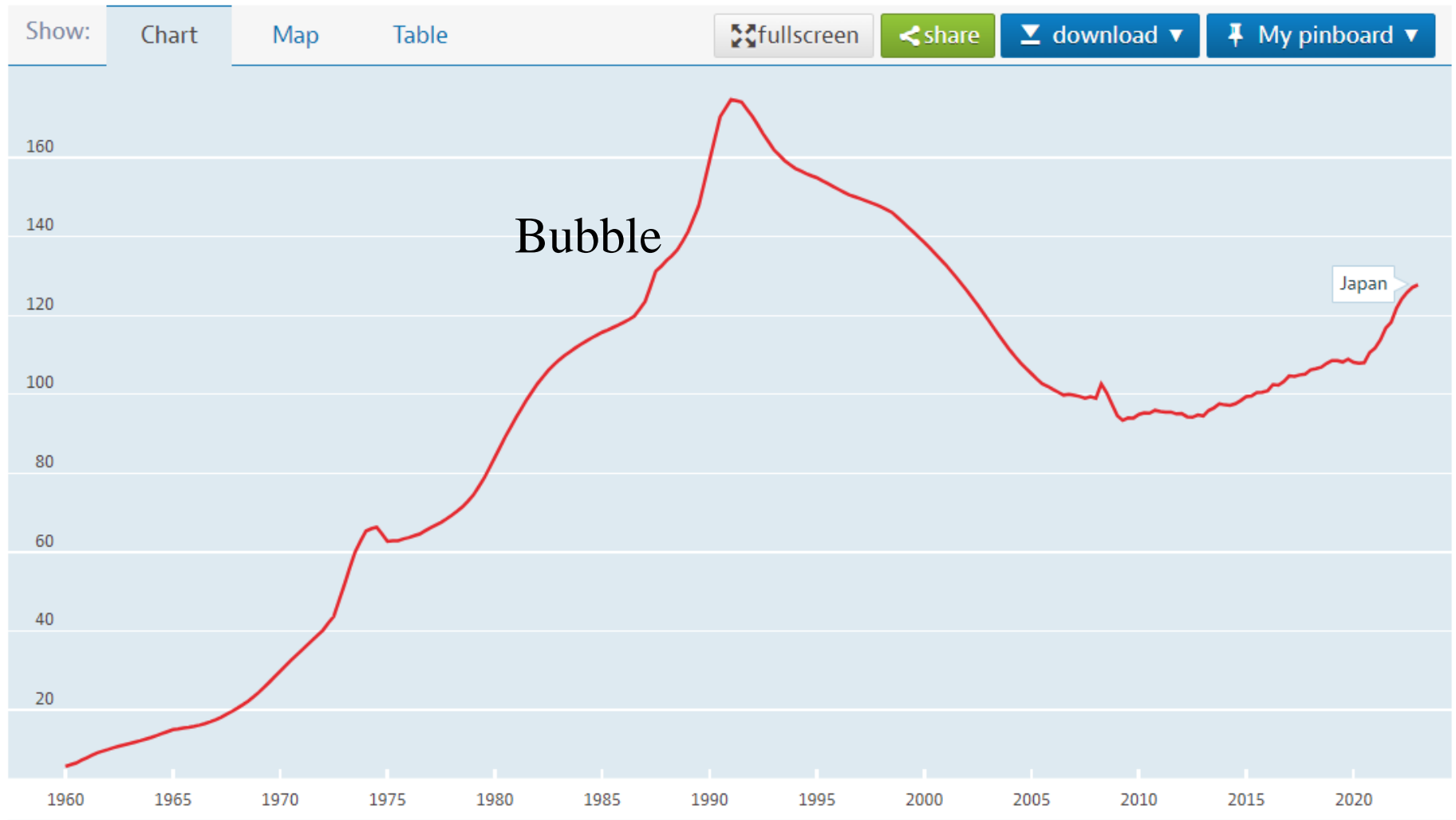


<https://data.oecd.org/price/share-prices.htm>

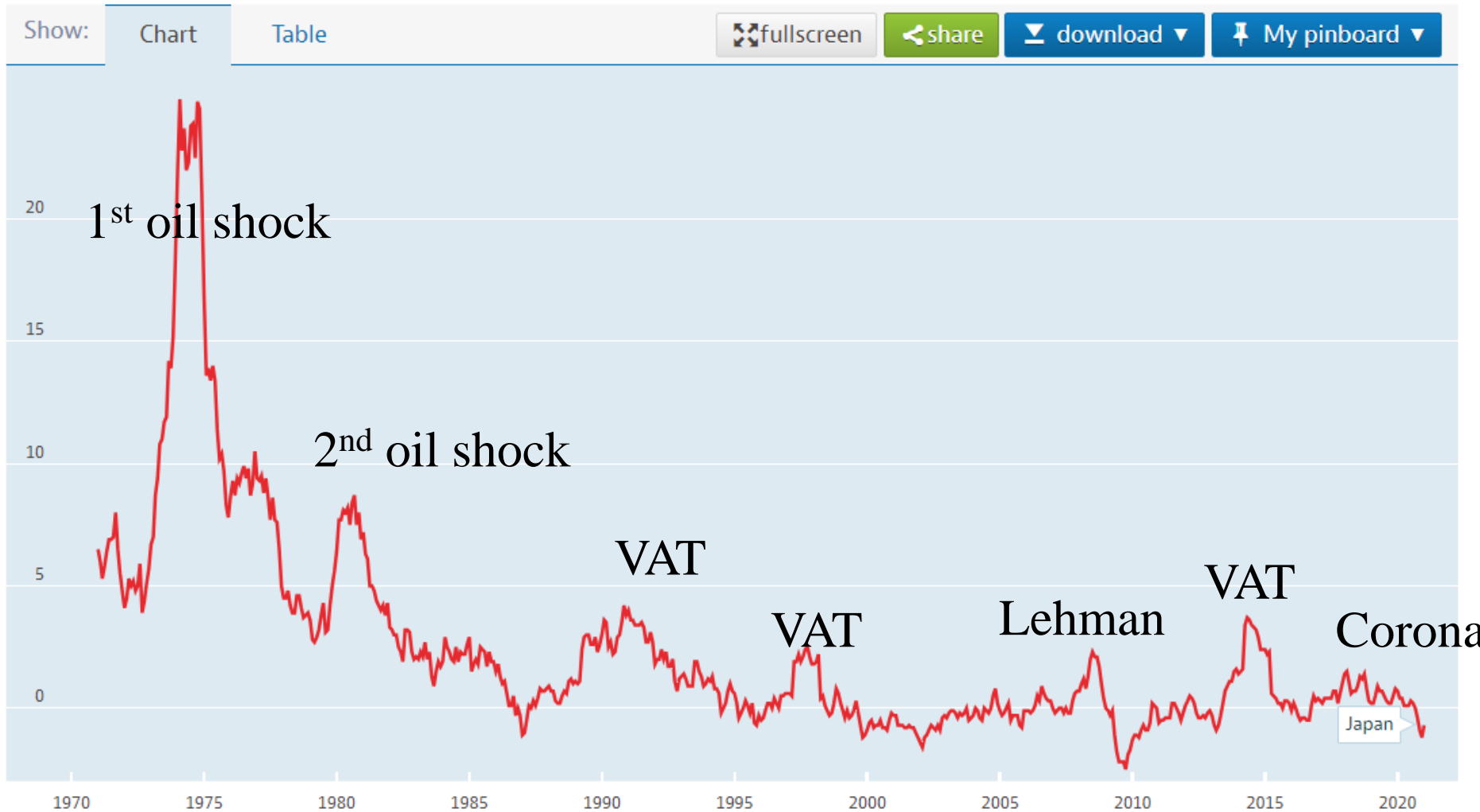
Housing prices

Nominal house prices, 2015=100, Q1 1960 – Q1 2023

Source: Prices: Analytical house price indicators



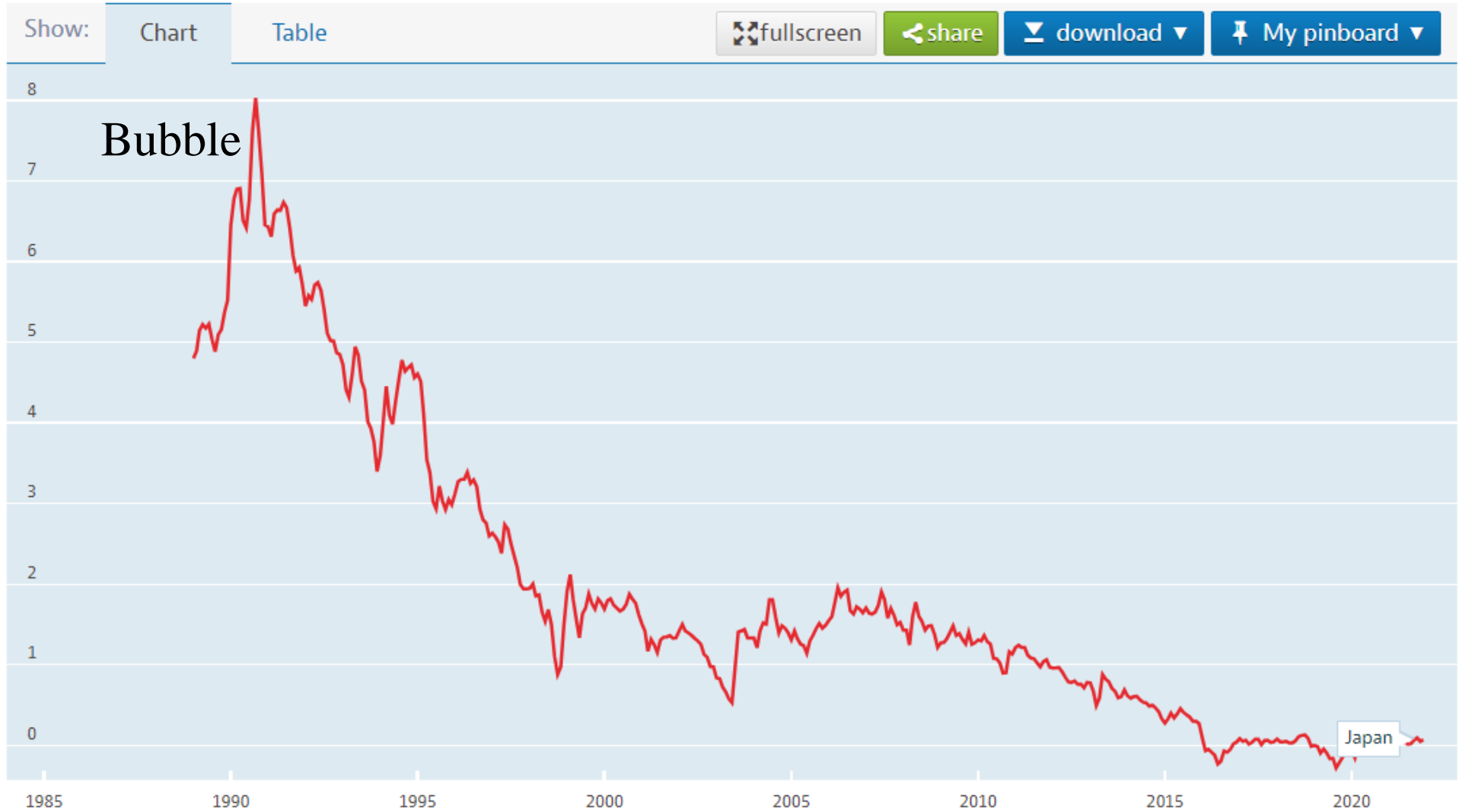
<https://data.oecd.org/price/housing-prices.htm>



<https://data.oecd.org/price/inflation-cpi.htm>

Long-term interest rates Total, % per annum, Jan 1985 – Dec 2021

Source: Finance



<https://data.oecd.org/interest/long-term-interest-rates.htm>

History of the Yen-Dollar Exchange Rate

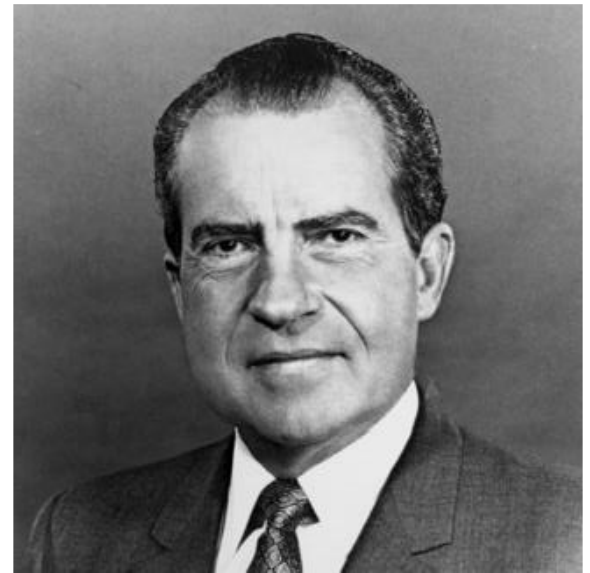
Ryoichi Imai

Bretton-Woods (BW) system

- From 1948 to 1971, the global economy was in a fixed-exchange rate system.
- Countries except US are responsible to maintain the fixed exchange rate of their domestic currencies with the US dollar.
- The US had an obligation to exchange 1 oz of gold with \$35.
- The BW system was a type of gold standard.

The Nixon Shock

- Members of BW were allowed to change the exchange rate only if their balance of payment was in a “fundamental disequilibrium.”
- In late 1960s, US suffered the increasing current account deficit, which was settled only by the reduction of the gold reserve.
- In August 15, 1971, the US President Richard Nixon finally announced that US suspended the convertibility of the US dollar with gold.



Transition to the Floating System

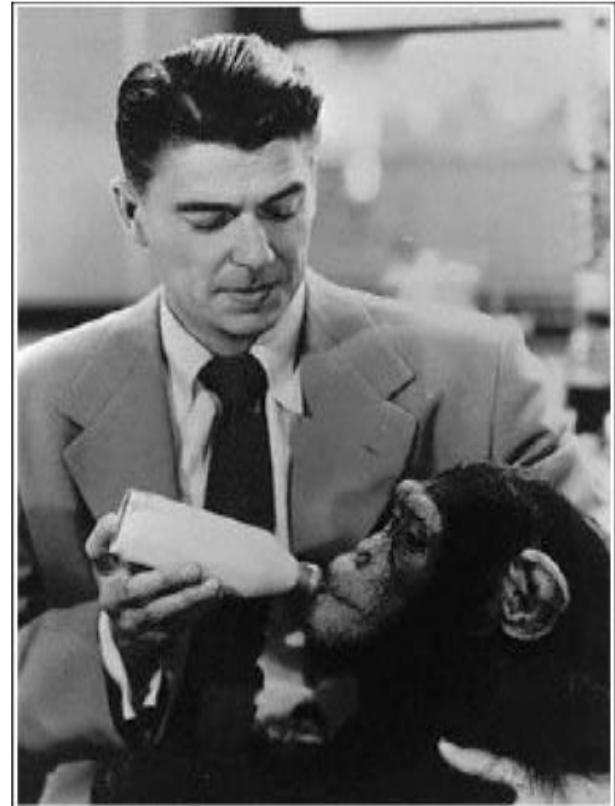
- (Smithsonian Agreement 1971) Japan agreed with America on the appreciation of Yen to ¥308/\$.
- The new parity lasted until 1973, when then the leading economy switched to the floating exchange rate system.
- Since then Yen has been appreciating. In 1978 it reached ¥180/\$.

The Two Oil Shocks

- In the 1980s, the West suffered from inflation and low growth, the so-called stagflation. One backdrop is the two oil shocks.
- The first oil crisis was triggered by the OPEC (Organization of the Petroleum Exporting Countries)'s announcement of a 70% increase in the official price of crude oil during the fourth Middle East war, when Israel attacked the Arab countries.
- The second oil crisis was caused by the Iranian revolution, which ousted the Shah, who had been cooperating with the West, and brought to power a regime based on Islamic fundamentalism.

The Reaganomics

- In late 1970 the US economy suffered inflation and low GDP growth (stagflation), which lowered US dollar.
- In 1980 Ronald Regan became the US President and took a drastic economic policy to raise interest rates and expand the government deficits. “



Bedtime for Bonzo

The Twin Deficits

- The high interest rate attracted foreign investors to buy US dollar at a higher exchange rate, which in turn made US industries less competitive and increased the *current account deficit*.
- The Regan administration cut taxes but raised military expenditure, which resulted in the huge *government budget deficit*.
- The Twin Deficits were gradually recognized as a fatal disease of the global economy.

Why military expansion?

- In 1980, the Soviet Union invaded Afghanistan. In response, the West protested strongly.
- That year, Moscow was scheduled to host the Olympics Games, but many Western countries, including the United States, Japan, and West Germany, boycotted their participation.
- On the other hand, most of the major European countries, including Britain and France, participated in the Moscow Olympics.

The Olympics as a means of political demonstration

- In 1984, the Olympic Games were held in Los Angeles; the Soviet Union and Eastern European countries did not attend in protest at the U.S.'s non-participation in the Moscow Olympics in 1980.
- Thus, the Olympic Games tend to be used as a symbol of political demonstration.
- In response to the escalating military tension between the U.S. and the Soviet Union, the Reagan administration expanded its military budget.

After the Afghanistan Invasion

- In response to the Soviet invasion of Afghanistan, the U.S. provided economic and military support to Muslim volunteer organizations.
- One of the young men trained in that program was Osama bin Laden, who later became infamous for the 2001 attacks.

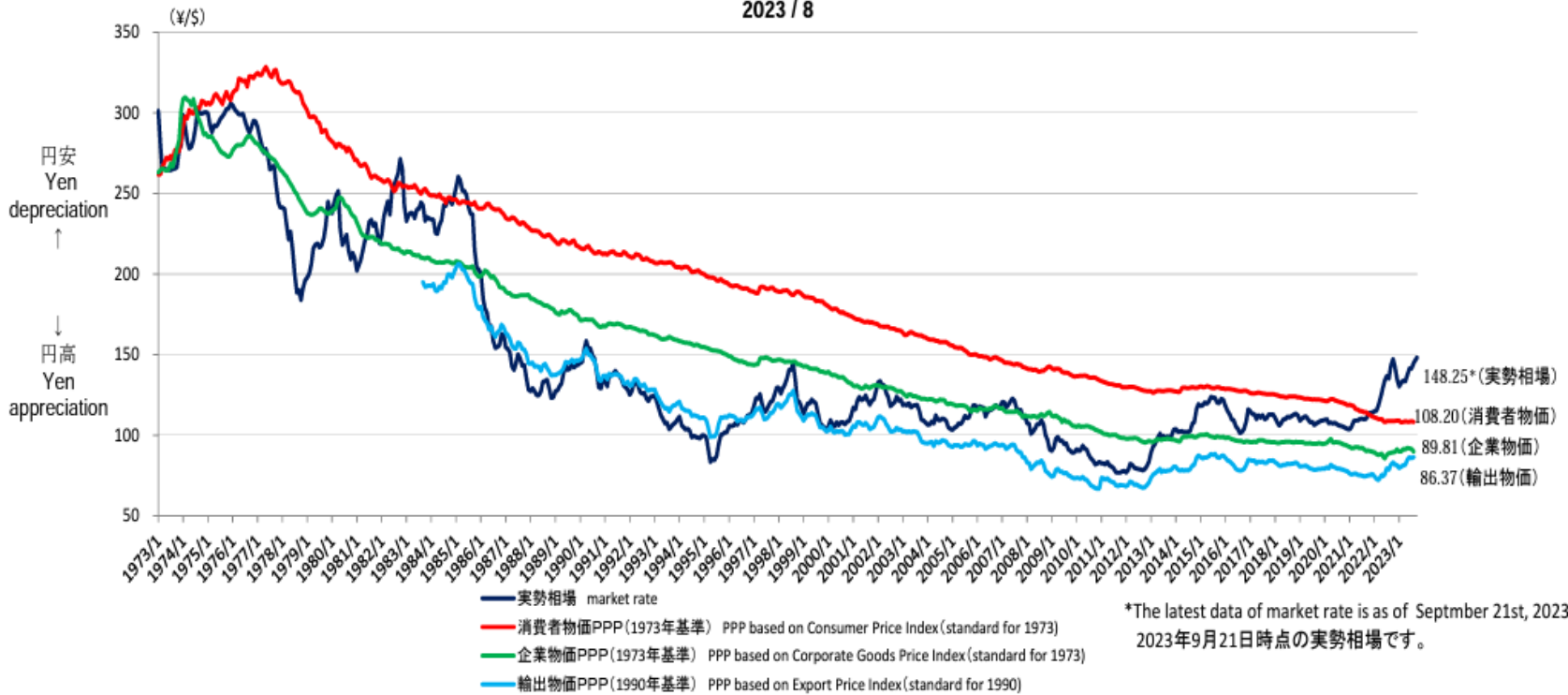
The Plaza Accord

- In 1985 the financial ministers and presidents of the central banks of the G5 countries (Japan, Germany, France, UK, and US) met at New York, and agreed on the devaluation of the US dollar.
- The US dollar dropped from ¥240 in 1985 to ¥120 in 1988.

The Ever-Appreciating Yen

- The Purchasing Power Parity (PPP) is the foreign exchange rate which equates the prices of tradable commodities across countries.
- In the long-run, the Yen/Dollar rate tends to converge to its PPP, which reflects the gaps in the inflation and productivity growth between countries.
- The productivity growth rates had been higher in Japan than in the US after the WWII, while the inflation rates higher in US since 1970s. Then the Yen must appreciate against the US dollar.
- The actual rate has been moving around the PPP.

ドル円購買力平価と実勢相場
 purchasing power parity and market rate / U.S. Dollar against Japanese Yen
 2023 / 8



- Indigo: Market rate
- Red: PPP based on CPI
- Green: PPP based on corporate price
- Blue: PPP based on exported goods

The Ever-Appreciating Yen Syndrome

- We can say that the Yen is overvalued if the actual rate is higher than its PPP based on the CPI (Consumer Price Index).
- The overvalued Yen creates deflationary pressure on the Japanese economy.
- The overvalued yen forces Japanese firms to exert some unsustainable efforts to reduce their production costs, which makes them even more competitive in the global market and yields further evaluation of the Yen.
- Eventually, the Japanese manufacturing firms reach their limit to the cost reduction, and close domestic plants and fire employees.
- This consequence is called as the Ever-Appreciating Yen Syndrome by Ronald McKinnon and Ken-ichi Ohno in 1999.

The Five Crises

- The Crush of the Bubble (1990)
- The Asian Currency Crisis (1997-98)
- The IT Bubble and its Crush (2000)
- The ‘Subprime’ Crisis (2007) and the Lehman Shock (2008)
- The Great East-Japan Earthquake (2011)

The Reason for the Lost Decade 1

- During 1990s the major opinion claimed that the recession was caused by the crash of aggregate demand associated with land and stock price.
- The government took a series of stimulating economy by adding public demand to private one, and piling up public projects.

The Reason for the Lost Decade 2

- However the demand-driven policy failed to help the economy to fully recover from the bottom.
- Then an alternative view took dominance in the 21st century.
- The new view claimed that it was productivity slowdown that made Japanese economy to stagnate so long.

Complex Recession

- Right after the crash of the bubble economy, the dominating view on the recession was that it was caused by insufficient demand, associated with the crash of land and stock prices.
- Economist Miyazaki called this “Complex Recession”, and his view was widely accepted in early 1990s.

Temporary Recovery

- Thanks to the demand-added policies repeated by the government, our economy recorded 3.8% real growth in 1996.
- Then the government raised the consumption tax rate from 3% to 5%.

Asian Currency Crisis

- International Investors attacked the currencies of some economic growth leaders in Asia in 1997.
- Before the crisis those Asian countries attracted global money into their growing industries with very high interest rates.
- However the growing pessimistic view among foreign investors caused a reversal of capital flow.
- The crisis was harsh especially for Thailand, Malaysia, Indonesia, and South Korea.

Fixed Exchange Rate and Foreign Currency Reserve

- Most of the emerging Asian economies adopted fixed exchange rate (FER) system and protected the value of their currencies by foreign currency reserves (FCR).
- But their FCR were not sufficient for maintaining the FER.
- Many of them dropped out of the FER system.

Crisis Prevention

1. Exchange rate regime
2. Financial sector soundness
3. Regulation on capital flow
4. Data transparency

Exchange rate regime

- In order to maintain a fixed exchange rate regime, a *sufficient* quantity of foreign reserves has to be maintained.
- But it is not clear how much is sufficient, with huge capital flows.

The Bipolar View

(the two-corner solution)

- The only stable, exchange rate systems are the two extremes:
 - The free floating exchange rate system
 - The hard peg (a *currency board* or *dollarization*)
- Any intermediate regime (managed exchange rate, crawling peg, soft peg, etc.) is unstable.

Currency Board System

- In the currency crises of 1997-2000, Argentina and Hong Kong survived spillovers from surrounding countries, because they adopted a currency board.
- Under a currency board, the amount of issued currency is restricted by the foreign reserves.
- The bipolar view lost its key evidence when Argentina was forced to devalue and float in December 2001.

Basket Band System (BBS)

- The currency authority takes policies to stabilize the value of the currency to a weighted average of the currencies of the countries trade partners.
- The BBS appears to a better solution than the bipolar view now.

Crisis of Japan in 1998

- The temporary recovery of Japanese economy was reversed by the double attack of the drop in demand caused by VAT increase and the Asian Currency Crisis.
- The financial system became fragile and three major financial corporations (Hokkaido-takushoku, Sanyo, Yamaichi) bankrupted.
- The leading party, LDP, lost the election in the Upper House, and PM Hashimoto resigned.

LDP cabinets

- Hashimoto (1996-1998): Lost election.
- Obuchi (1998-2000): died of a brain stroke.
- Mori (2000-2001): unpopular and resigned.
- Koizumi (2001-2006): retired successfully.
- Abe (2006-2007): threw away his cabinet.
- Fukuda (2007-2008)
- Aso (2008-2009)

DP cabinets and the Return of Abe

- Hatoyama (DPJ, 2009-2010)
- Kan (DPJ, 2010-2011)
- Noda (DPJ, 2011-2012)
- Abe (2nd, 2012-2020, assassinated in 2022)
- Suga (2020-2021)
- Kishida (2021-)

Why Japan's cabinets last so short?

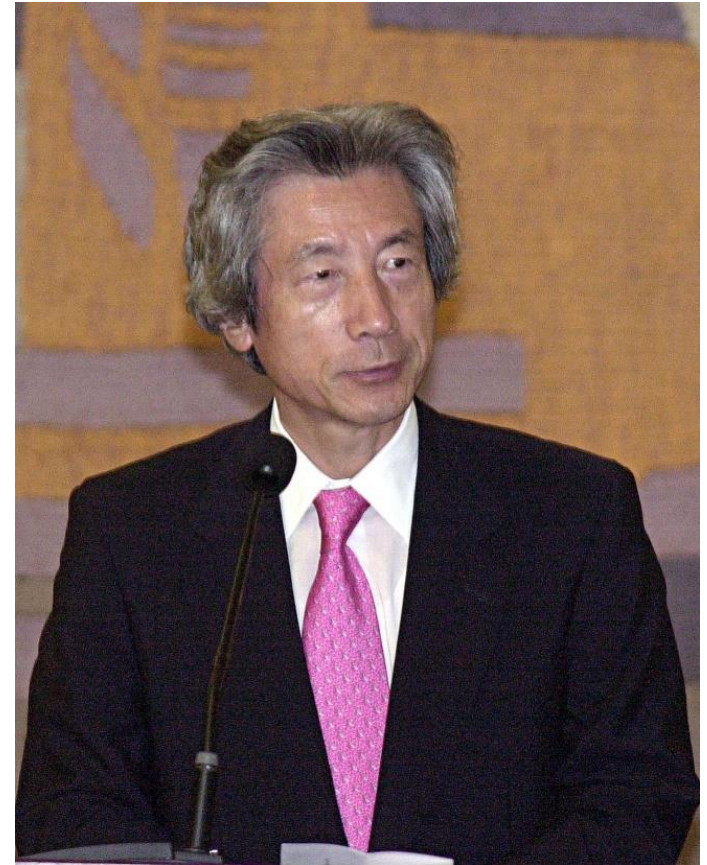
- The short tenure of the DP cabinets can be explained by the “nejire (twist)”, that is, the fact that the majority party of the lower house does not hold majority of the upper house.
- However, the short tenure of Japan's cabinets started in the late 1980s.
- The reform of election system (, introduction of the one-seat districts) done in the early 1990s might have made our political rule fragile, although PM Abe maintained his position for 8 years.

IT bubble

- Obuchi changed economic policy and increases public demands.
- Thanks to Information Technology Bubble, Japanese economy recovered in 1999.
- However, the bubble crashed and Obuchi died in illness in 2000.

Koizumi and Takenaka

- In 2001, Koizumi was chosen as LDP president by LDP's party member's vote, to be elected as Prime Minister.
- He appointed Takaneka as Minister of Economy, and started *Koizumi Reform*.



“Structural Reform”

- Koizumi’s policy focuses on the supply side of the economy, viewing the persistence of low-productivity firms as the main cause of our economic slump.
- Postal Saving (PS), government-run financial service corporation, was regarded by Koizumi as the main financial sources for those inefficient firms.
- Koizumi’s goal was to privatize PS.

Economic Crisis Again

- Koizumi was applauded by people for his strong political leadership.
- But the economy became even worse, thanks to demand fall associated with the 9.11 terrorist attack.
- In 2003, Nikkei index of Tokyo Stock Exchange (TSE) recorded the historical lowest at 7600 yen.

The Bad Loan problem

- The economic crisis was partly caused by Takanaka's drastic policy to clear unperformed loans.
- Takenaka obliged banks to report the true values of their net assets in the balance sheets.
- Many banks suffered capital shortage after they made their 'true' balance sheets open to public.



Was Investment Constrained?

- The “Credit Crunch” hypothesis:
 - Firms cannot invest as much as they want, because there is a limit on the amount they can borrow.
- This hypothesis seems to be convincing because the collapse of bank loans occurred in the same period, due to the BIS regulation on the banks’ equity capital ratio.

ASSETS

LIABILITIES

Loans and other Assets	Deposits
	Equity capital

Bank's Balance Sheet

Japan's banks have been heavily in debts, due to the insufficient development of capital markets.

BIS regulation:
Equity capital must be higher than 8% for international business

Reversal of the Fortune

- Takenaka dramatically changed his harsh policy on banks and bailed out Resona Bank Co. in 2003.
- Then Japanese economy started to recover.

Supply-Side Views on the Lost 90s

- In late 1990s, Hayashi and Prescott presented an academic work to explain Japan's economic slump by the **slowdown of TFP** growth.
- In early 2000s, Hoshi and others pointed out the **Zombie** firms as the main causes of Japan's low productivity.

The Neoclassical Growth Theory

- Output per adult y can be decomposed into four factors:
 1. TFP (productivity growth)
 2. Workweek (How long you work)
 3. Employment rate (Who are hired at jobs)
 4. Capital intensity (capital per unit labor)

TABLE I
Accounting for Japanese Growth per Person Aged 20–69

Period	Growth rate	Factors			
		TFP factor	Capital intensity	Workweek length	Employment rate
1960–1973	7.2%	6.5%	2.3%	–0.8%	–0.7%
1973–1983	2.2%	0.8%	2.1%	–0.4%	–0.3%
1983–1991	3.6%	3.7%	0.2%	–0.5%	0.1%
1991–2000	0.5%	0.3%	1.4%	–0.9%	–0.4%

Growth Accounting (TABLE 1)

- Except for 73-83, the TFP growth accounts for the most part of the sources of Japan's economic growth.
- There is a dramatic decline in TFP growth in the early 1990s.
- Both the workweek length and the employment rate have been declining.

Economics of Zombie

(Caballero, Hoshi, and Kashyap)

- In 1990s many firms were financially supported by the banks with the interest rate cut, while most of them lacked productivity growth and should be replaced by new firms.
- Persistence of low productivity firms supported by banks makes it hard for new, productive firms to enter the industry.

Deflation

- Around the turn of the century, Japan's inflation rate became negative (deflation).
- Bank of Japan (BOJ) was forced to take some untraditional policies such as *zero-interest* and *quantitative ease*.
- Shirakawa, the former BOJ governor argues (in 2012) that Japanese economy change around 1997, not around 1990.

Conventional Monetary Policy

- Control on short-run interest rates: BOJ intervenes the inter-bank market to supply or absorb liquidity.
- Open-Market Operations on midterm or long-term securities such as national bonds (treasury bills in US).
- These policies are effective if the nominal interest rate is sufficiently above zero.

Unconventional Monetary Policies

- With zero interest rate, the inter-bank market loses its adequate function, and money is stored in cash.
- BOJ was forced to make operations with longer maturities such as national bonds.
- BOJ took the *quantitative ease* policy to mandate banks not to hold too much liquidity.

Intervention into FOREX

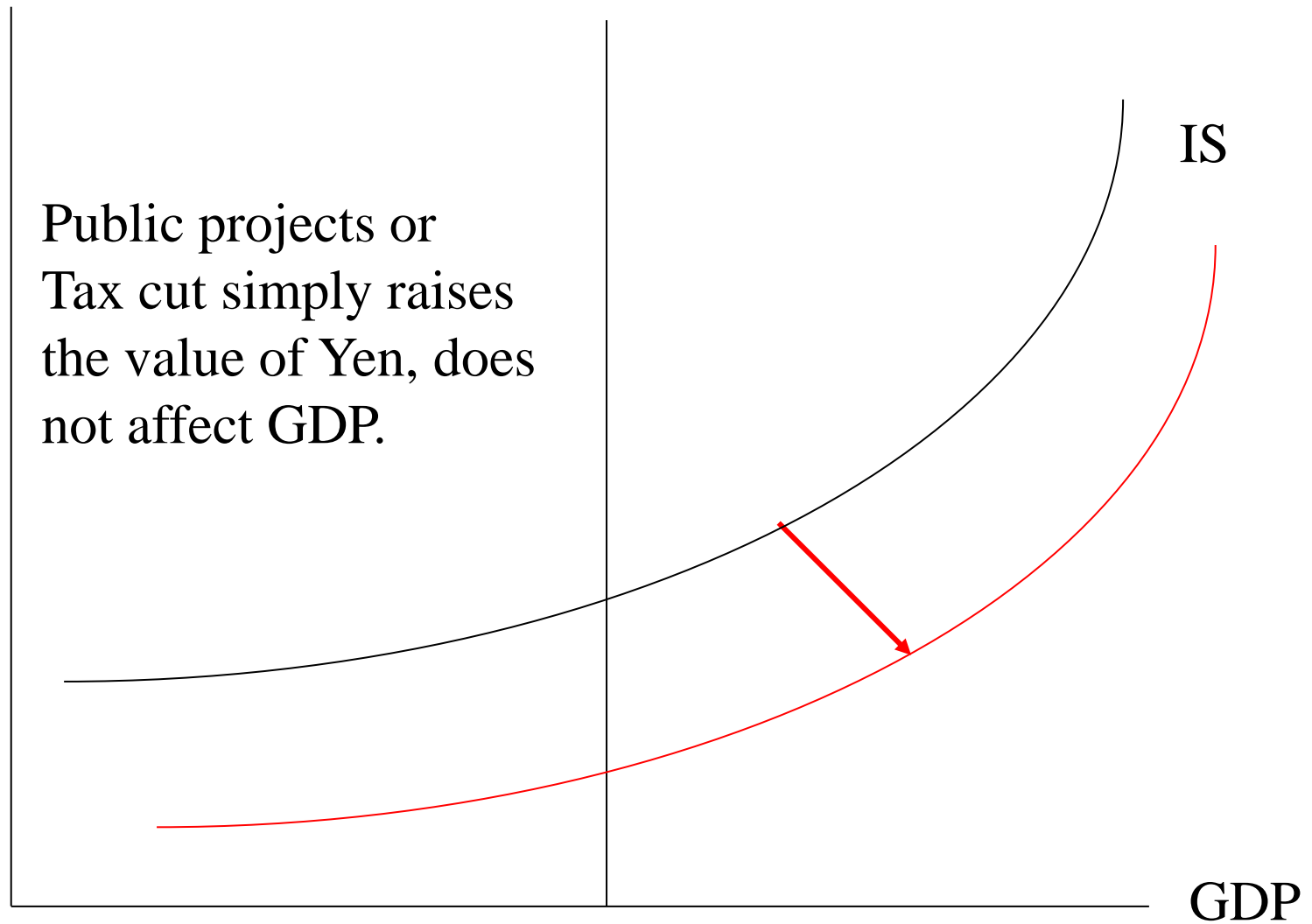
- The MOF, coordinated with BOJ, took a drastic intervention into the foreign exchange market to purchase US dollars to keep the value of Yen low.
- Some leading economists like John Taylor (deputy director of US Finance Department) acknowledge that this decisive intervention into FOREX in coordination with BOJ was the main demand-side factor for Japan's recovery in the early 2000s.

The Mundell-Fleming Model

- Fiscal Policies (public investment, tax cut) will temporarily increase the interest rate, attract foreign capital, cause the currency appreciation, and reduce exports, without changing national output.
- Monetary Policies (increasing money supply) will temporarily reduce the interest rate, lose foreign capital, cause the currency depreciation, and increase exports and national output.
- In both the cases, the interest rate will return to its original level, because the financial market is integrated across national borders.

Price of \$ in ¥

LM

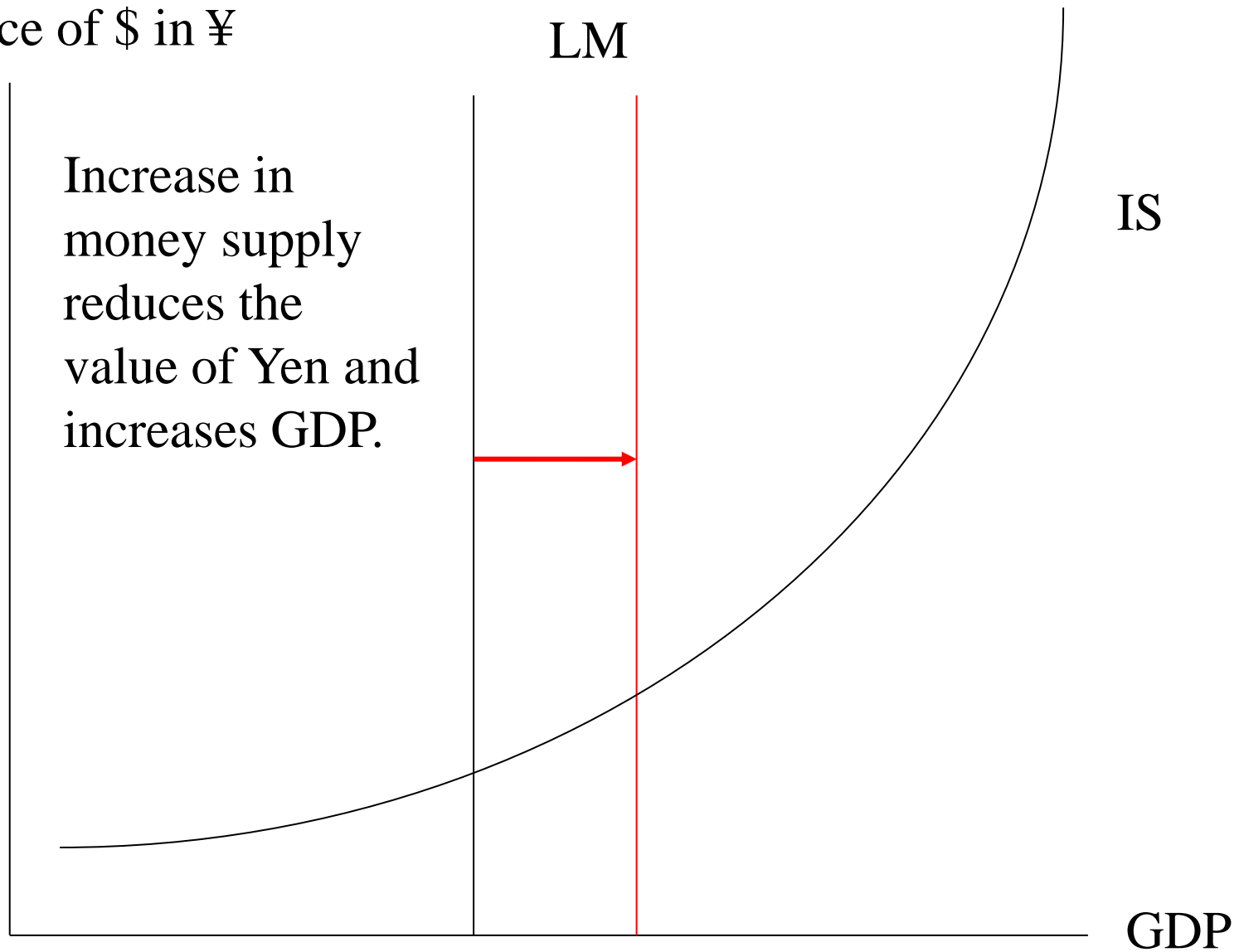


Price of \$ in ¥

LM

Increase in money supply reduces the value of Yen and increases GDP.

IS



Weak Yen and Japan's Recovery

- In an open economy, the central bank cannot directly control the domestic interest rate because it is determined by the international capital flow.
- However, increasing money supply will reduce the Yen's value and drive the economy out of slump through increasing exports.

The Recovery with/without Structural Reforms?

- In 2005, Japan almost fully recovered from the lost decade, while a few evidences of successful structural reforms being done.
- The bad loan problem was almost solved, while the removal of the credit-crunch on firms' balance sheet did not automatically increase investment.

Still in Deflation

- Even after the recovery, domestic consumption was still weak and the CPI excluding foods and energy showed no significant inflation.
- This was explained by:
 - global competition with the emerging economies
 - BOJ's reluctance for further monetary expansion.
- A drastic policy change occurred in 2012, when Shinzo Abe was appointed to be PM.

Supplement: Government Sponsored Financial Institutions

Takeo Hoshi and Anil K Kashyap
Journal of Economic Perspective 2004

Government Financial Institution

- Postal saving systems provide much more convenient services (huge number of branches, competitive interest rate on deposits, no maintenance fees).
- Government Housing Loan Corporation (GHLIC) accounts for 40% of all home mortgage loans.
- The public has not been convinced that the government-sponsored financial institutions are the reasons of Japanese banks' low profitability.

Fiscal Investment and Loan Program (FILP)

- A large part of deposits collected by postal saving system go to FILP, which in turn lends to government-sponsored corporations such as:
- Government Housing Loan Corporation (¥66 trillion)
- Development Banks of Japan (¥15 tr.)
- Japan Highway Public Corporation (¥22 tr.)
- Japan Finance Corporation for Municipal Enterprises (¥18 tr.)
- Urban Development Corporation (¥15 tr.)

Why is FILP so bad?

- Most of borrowers of FILP are doing unprofitable activities.
- The loss of FILP is compensated for by the government subsidies, and eventually require a taxpayer bailout.
- The assets of FILP borrowers are overvalued.
 - Most of assets are counted by the high book values at which they purchased them in the Bubble Period.

Most of the FILP problems have been alleviated

- The Postal Saving System, the largest financing source of the FILP, was privatized in 2007.
- The FILP agencies finance their investments by issuing bonds in the market.
 - The quality of investment is always evaluated in the market.

The 'Subprime' Crisis (2007) and the Lehman Shock (2008)

Ryoichi Imai

The 'Subprime' loan in the US

- The US residential land prices had been increasing more than proportionally to its GDP since 2003.
- This was caused significantly by the increase in generous loan offers to financially unreliable households with high bankruptcy risks.

Crush of the Bubble

- In the late 2006, the land price started to decline.
- The Housing Bubble was recognized by the US stock market in July 2007.
- Finally, Lehman Brothers bankrupted in October 2008.
- Dow index declined from 14000 (October 2007) to 6547 (March 9, 2009).

Bailouts

- (Wikipedia) A **bailout** is a fresh injection of liquidity to a bankrupt or nearly bankrupt entity, such as a corporation or a bank, in order for it to meet its short-term obligations.
- Bailout Examples
 - Bear Stearns (investment bank)
 - Fannie Mae and Freddy Mac (semi-public corporation to underwrite the mortgage loans created by banks in private sector)
 - American International Group (world's largest insurance company)
- Lehman was not bailed out.

Bailout in balance sheet

Firm in Crisis		After Bailout	
ASSETS	LIABILITIES	ASSETS	LIABILITIES
Loans and other Assets	Debts	Loans and other Assets	Debts
	Equity capital		Equity capital
			Public funds

‘derivative’ securities.

- There is a tradeoff between the high risk and the high return.
- The ‘subprime’ loans was combined with ‘prime’ loans and sold to investors as ‘derivative’ securities.
- Investors tend to neglect the high risk of the derivative securities, because they are advertised as ‘safe’ thanks to the highly developed financial technologies.

Black-Scholes Formula

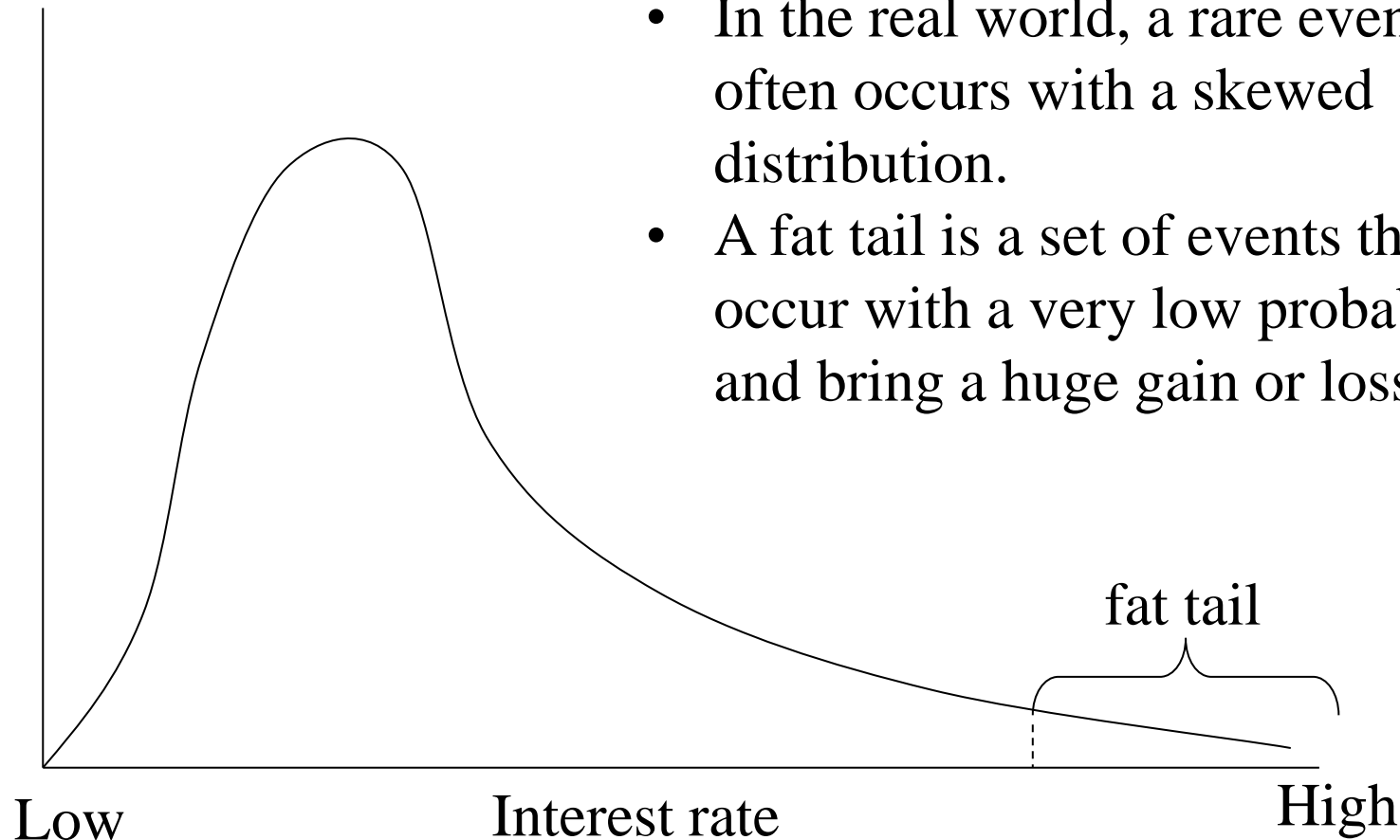
- Fischer Black and Myron Scholes published a mathematical formula to calculate the theoretical price of European stock options in *Journal of Political Economy* (1973).
- Their research was soon extended to the pricing of various financial products. The formulae have been widely used by the financial industry to make huge profits.
- Scholes and Robert Merton were awarded a Nobel Prize for Economics in 1997.
- Unfortunately, Black died in 1995, before he was awarded.

Taking Huge Risks

- The core strategy to obtain huge profits in the financial industry (investment banks and hedge funds) is to make a portfolio that yields the highest expected profits for a given risk distribution.
- Sometimes they take too much risks to obtain huge profits.
- They often fails by the *fat tail* events.

The fat tail

Probability
density



- In the real world, a rare event often occurs with a skewed distribution.
- A fat tail is a set of events that occur with a very low probability and bring a huge gain or loss.

The LTCM

- Before 1998 the Long-Term Capital Management was the “Dream Team” in the financial industry, hiring Merton and Scholes.
- They bet on the prospect that the interest rate gap within Europe would be reduced thanks to the economic integration.
- But the sovereign bond crisis in Russia caused by the Asia Currency Crisis *increased* the interest rate gap in Europe, which resulted in a bankruptcy of LTCM.
- The Fed coordinated other banks to bailout LTCM.

The Liquidity Crisis in 2008

- This time, the US private sector could no longer bailout all the financial institutions, because the crisis is was huge and profound.
- Due to the complexity of the derivative securities, it was hard to verify the true loss caused by the housing price decline.
- (Disorganization) Firms could no longer rely on the financial sustainability of their business partners.
- Bailout by public funds was the only way to stabilize the economy.

Emergency Economic Stabilization Act (EESA)

- The Emergency Economic Stabilization Act was proposed by the Bush administration in September 2008, but was rejected by the US congress in the first round, and was approved by the US diet in the early October 2008.
- The Congress rejected it in the first round, being afraid of the tax payers' anger on the CEOs of the financial industry.
- The bill enabled the government to inject public funds into the balance sheet of the weak business.
- However, the stock market focused more on the weak real economy (consumption, production, and employment).

The Stagnation

- After several policy measures were taken, the initial crisis was over in March 2009, according to the NBER report.
- The US and the World Economy steadily recovered.
- However, the true recovery came in 2016, when the unemployment rate returned to its pre-crisis level.
 - <https://fred.stlouisfed.org/series/UNRATE>

The Euro Crisis

- The stagnation was even worsened by the public finance crises in Europe in 2011.
- Greece was near bankruptcy.
- Spain and Italy seemed to follow Greece.
- The EU faced a difficult choice between;
 - Bailing out the financially weak Euro members, or
 - Kicking them out of the Euro zone.

“Japanization”

- The US government spent a huge budget to stimulate the economy.
- The Fed took a series of unconventional monetary policies, named QE1 and QE2.
- Even after the recession was over, the nominal interest rate remained close to zero, and the US economy looked like Japan since 1990, until the world was hit by the Covid-19 pandemic in 2020.

The *Endaka*

- In 2009, Japan's export industries suffered the Yen appreciation to the even higher level than the one reached in 1995.
- At the nominal value, the Yen is at the historically highest level, 75¥/\$ in October 2011, when Japan was hit by the great east-Japan earthquake.
- However, the effective real exchange rate was not so high as the nominal one.

The Effective Real Exchange Rate

- The nominal exchange rate is not a good measure of a country's competitiveness in the global economy.
- Inflation and trade shares must be accounted for the global competitiveness.

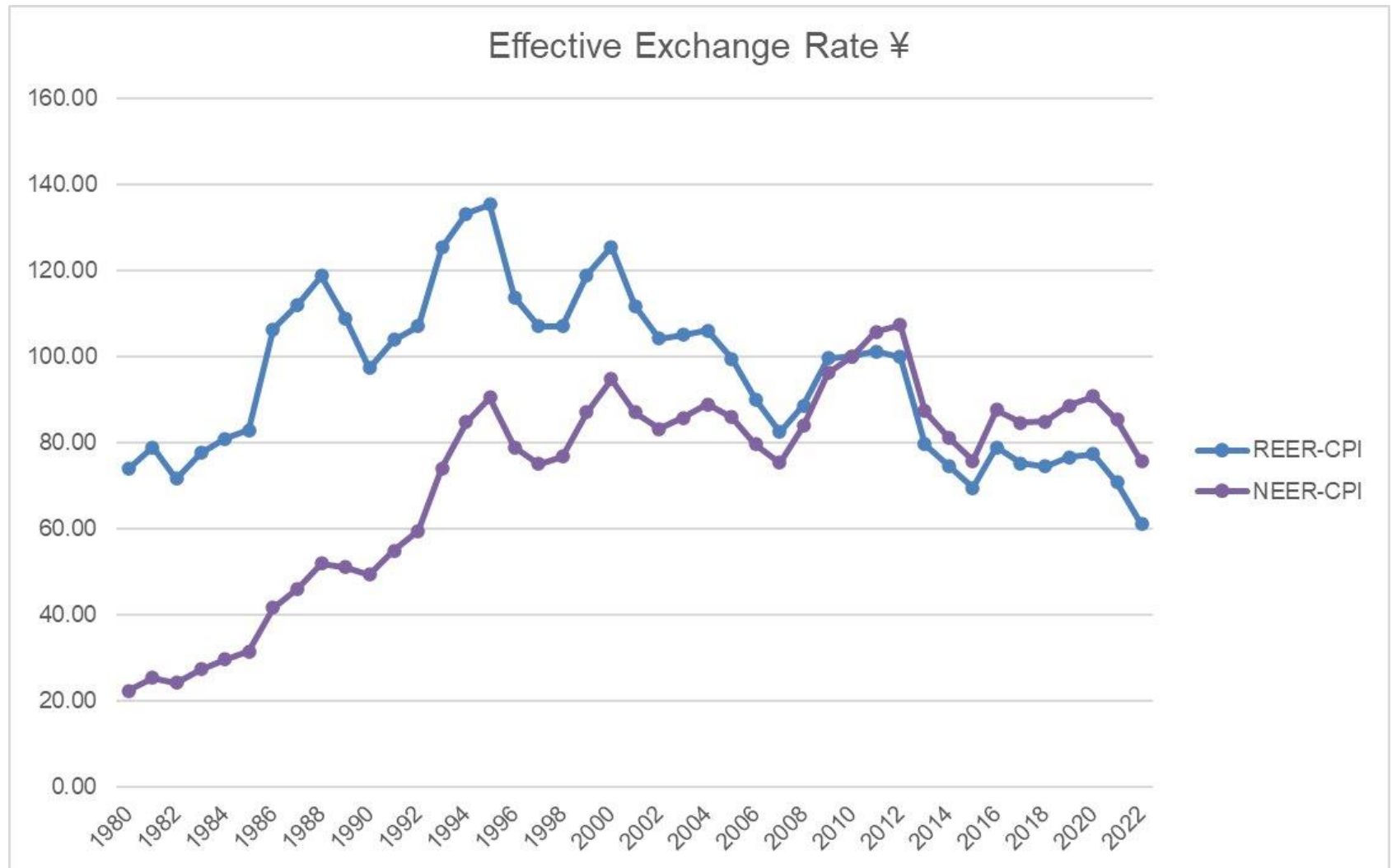
Inflation

- In the last three decades, Japan suffered deflation, which involved a continuing decline in the production costs, including employees' wages.
- On the contrary, the inflation rate in the US was significantly above zero, which reflected the continuing rise in the production costs.

Trade Shares

- 20 years ago, the US was the largest trade partner of Japan.
- Today, the US is replaced by China.
- Therefore, the weight of China's Yuan is higher than that of the US dollar in the calculation of the effective exchange rate of the Yen.
- *The Nominal Effective Exchange Rate* is the exchange rate index based on the trade share.
- *The Real Effective Exchange Rate* is the exchange rate index based on both the trade share and inflation.

Nominal versus Real Effective Exchange Rate



<https://data.imf.org/regular.aspx?key=61545850>

NEER and REER

- The difference between **NEER** and **REER** is the effect of inflation in the foreign countries.
- As a total, the **REER** is at a historically lowest level since the early 1970s.
- The **NEER** of the Yen seems not to be too low, while it does not account for the higher inflation rates in the foreign countries, which is accounted by the **REER**.

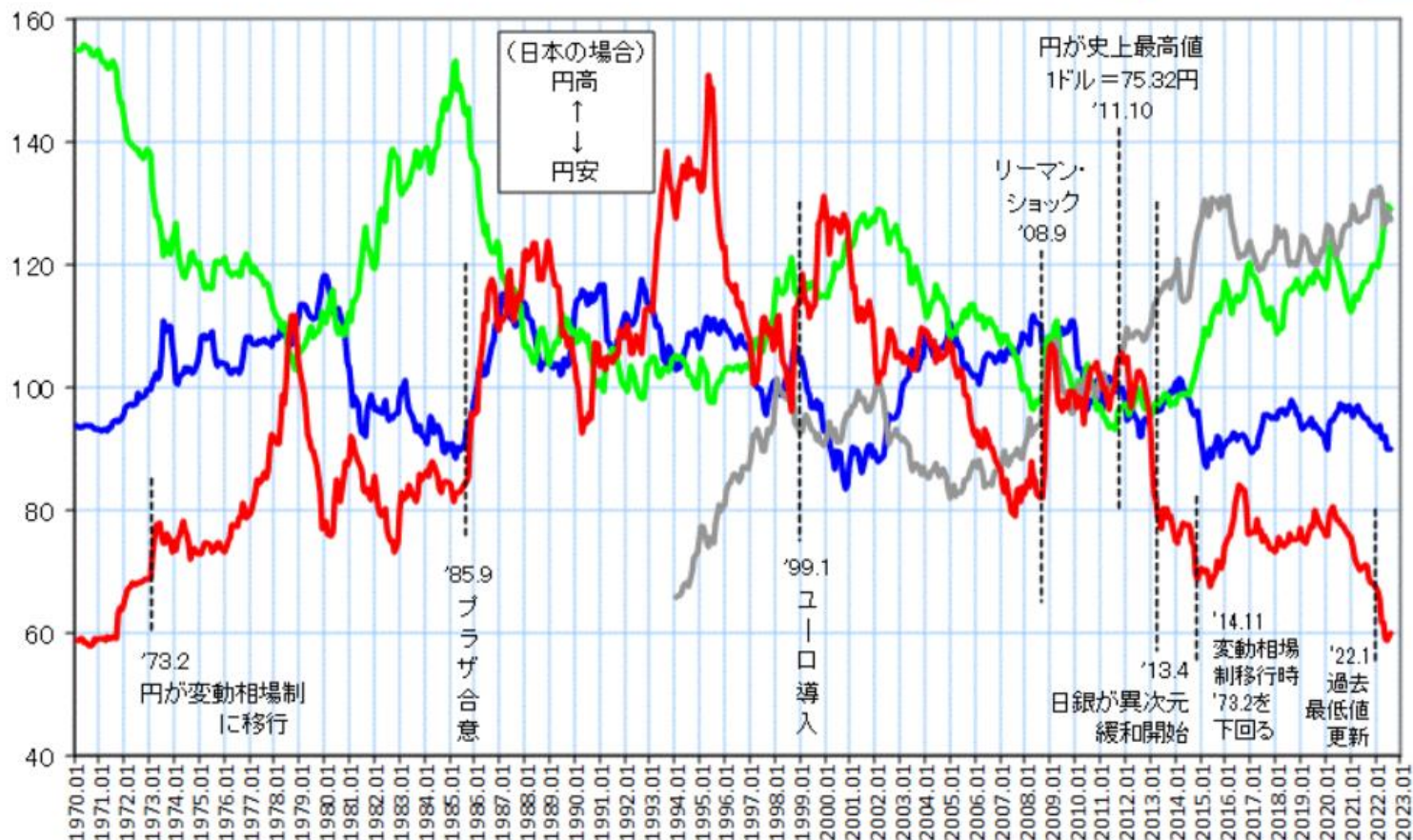
Real Effective Exchange Rates of the Major Economies

実効為替レートの推移(日本・米国・ユーロ圏・中国)

(2022年8月まで)

消費者物価指数ベースの実質実効為替レート(月平均、2010年=100)

ユーロ圏 米国 中国 日本



(注) 対象バスケットはブロードベース(58カ国)。ただし1993年以前はナローベース(27カ国、中国を含まず)に接続。

(資料) BIS(国際決済銀行)HP、毎日新聞2014.12.19(年表事項)

<http://www2.ttcn.ne.jp/honkawa/5072.html>

Balassa-Samuelson Effect

- (Balassa-Samuelson) Economic theory suggests that domestic currency is overvalued if productivity growth is faster in the tradable sector than in non-tradable sector.
- The **REER** of the Yen in 1990s was high partly because productivity growth was higher in tradables than in non-tradables.
- In the last two decades, Japan's productivity growth is slowing down in the tradable sector and accelerating in the non-tradable sector, which may explain the low real effective rate in recent years.