



TOKYO COLLEGE



Central Banking

In the age of
Artificial Intelligence, Climate Change, Inequality and
Populism

Luiz Awazu Pereira da Silva

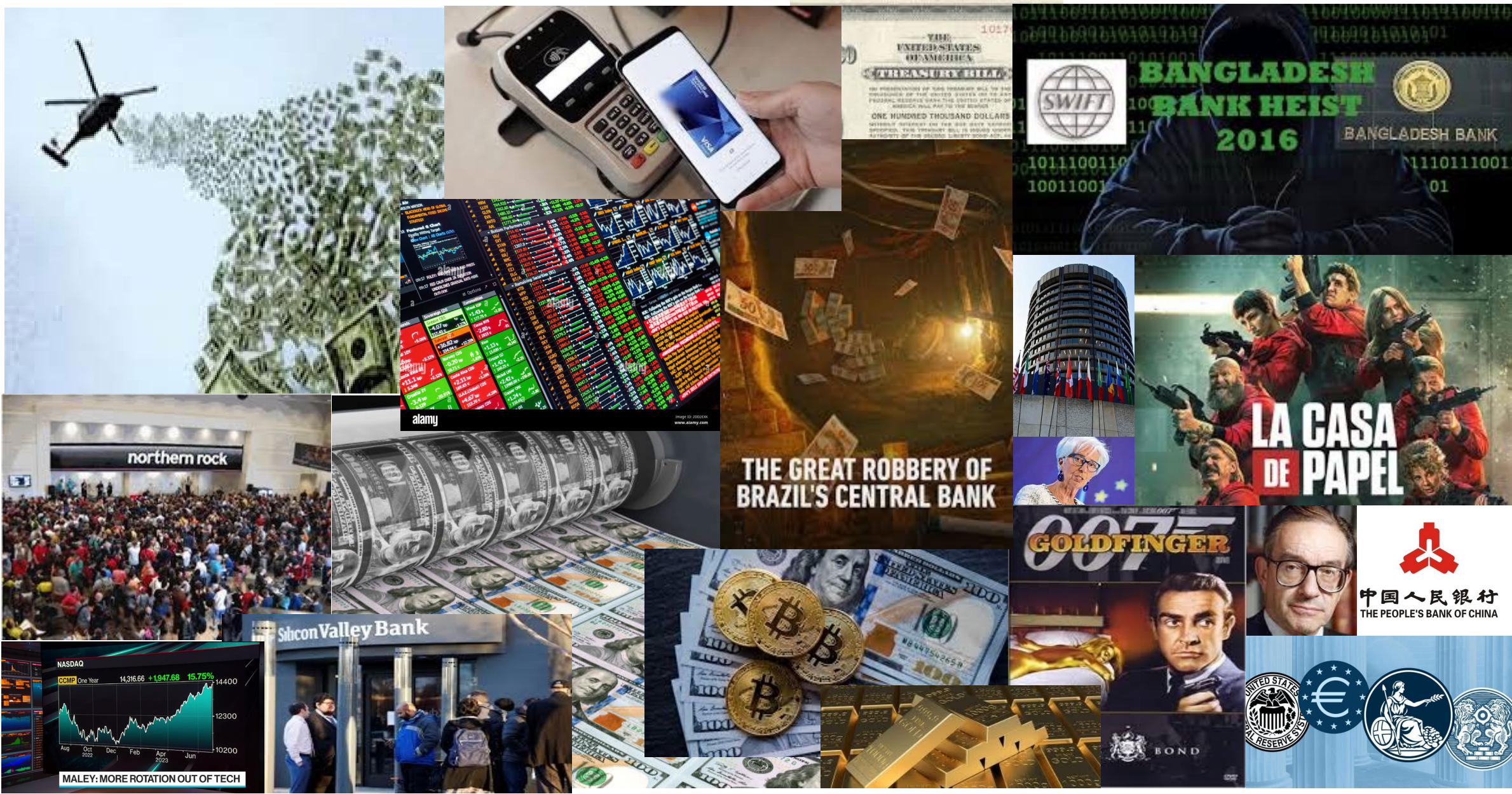
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Session 1: Introduction and Course Outline **Central Banking**

In the age of
Artificial Intelligence, Climate Change, Inequality and Populism

Central Banks:

- What is a Central Bank in popular imagination?
- What role is played by a Central Bank?
- How do Central Banks affect your life?



Does transparency hand power to the hackers? **Carbon credits and the scramble for Africa**

Oil allies Putin meets MBS in Riyadh

Russian President Vladimir Putin and Saudi Arabia's Crown Prince Mohammed bin Salman met in Riyadh on Tuesday to discuss the future of the oil market and the role of Russia in the Middle East. The meeting was the first between the two leaders since Putin's invasion of Ukraine in February. The Saudi prince is expected to visit Moscow in the coming days to discuss the future of the oil market and the role of Russia in the Middle East.



Economists predict Fed rate cuts later and smaller than Wall Street is betting

● Poll says no move before July ● Doubts over inflation fight ● Jobs, wars and oil prices blur picture

The 12-member FOMC is expected to cut rates in July 2023, according to a survey of economists. The survey also found that the FOMC is expected to cut rates in September 2023, which is later than what Wall Street is betting. The survey also found that the FOMC is expected to cut rates in November 2023, which is later than what Wall Street is betting. The survey also found that the FOMC is expected to cut rates in December 2023, which is later than what Wall Street is betting.

The survey also found that the FOMC is expected to cut rates in January 2024, which is later than what Wall Street is betting. The survey also found that the FOMC is expected to cut rates in February 2024, which is later than what Wall Street is betting. The survey also found that the FOMC is expected to cut rates in March 2024, which is later than what Wall Street is betting.

The survey also found that the FOMC is expected to cut rates in April 2024, which is later than what Wall Street is betting. The survey also found that the FOMC is expected to cut rates in May 2024, which is later than what Wall Street is betting. The survey also found that the FOMC is expected to cut rates in June 2024, which is later than what Wall Street is betting.

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Rome's exit from China Belt and Road pact eases source of friction with allies

Italy has officially withdrawn from the Belt and Road Initiative, a major infrastructure project led by China. The move is seen as a significant step towards easing tensions between Italy and China, and is expected to improve Italy's relations with its allies. The move is also seen as a sign of Italy's growing independence from China, and is expected to lead to a more balanced relationship between the two countries.

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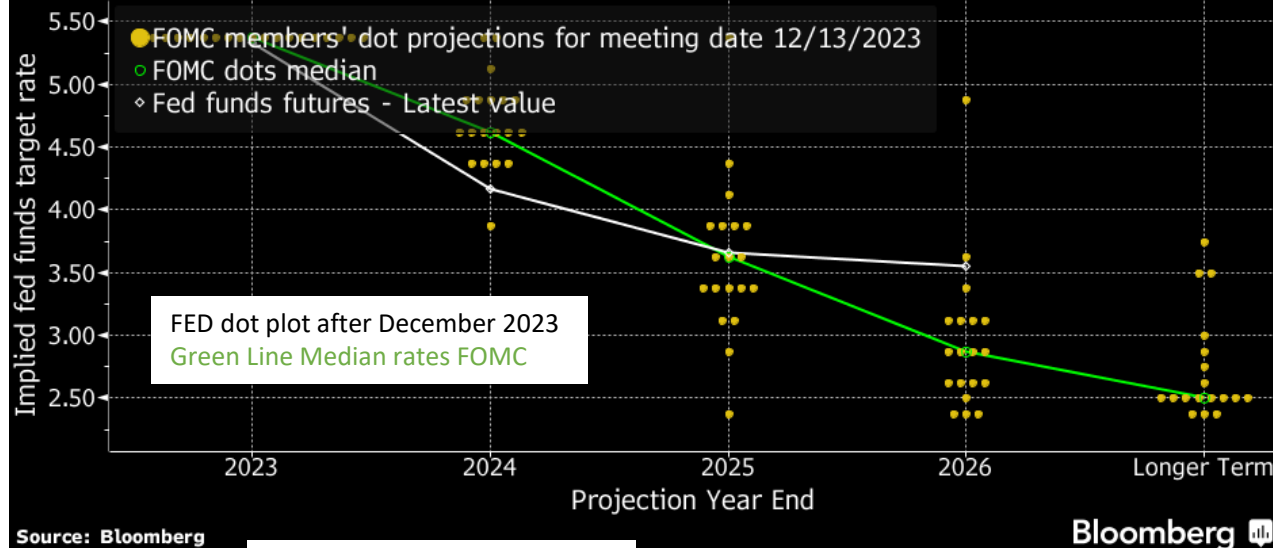
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Collection for profit and utility
The FT is a collection of articles and images, including a photograph of a man in a suit standing in front of a large building.

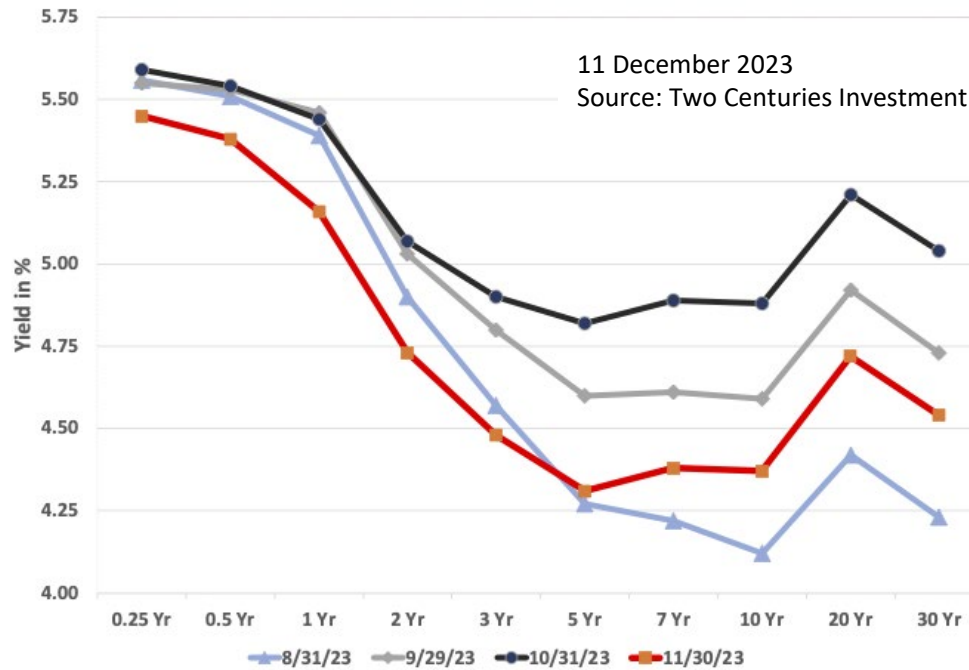


The Fed's December Dot Plot



FED dot plot after December 2023

U.S. Treasury Par Yield Curve

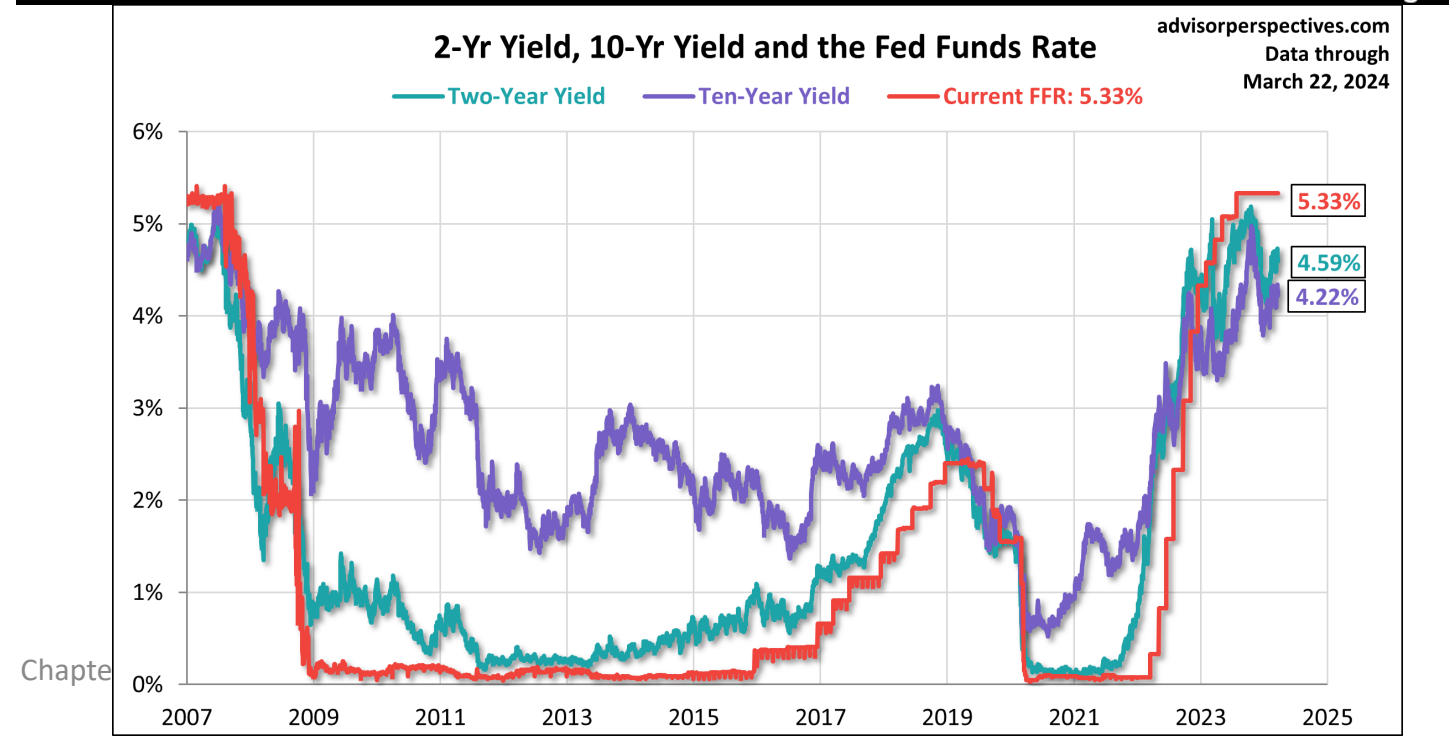
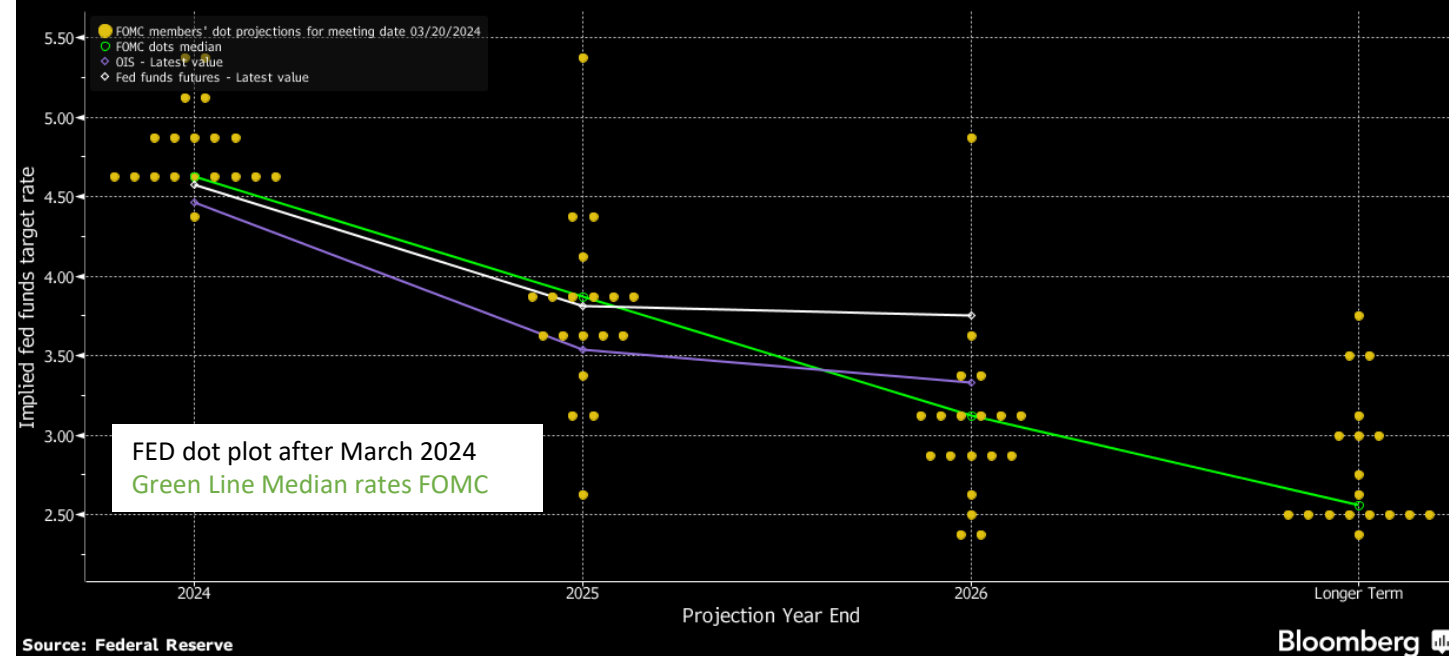


14 December 2023
Source: FT

“Last Mile” inflation After March 2024

- The Federal Open Market Committee (FOMC) announced on March 20 that it would maintain its **policy rate in a range of 5.25% to 5.5%.**
- The March decision marks the fifth consecutive meeting at which the Federal Reserve (Fed) has opted to hold interest rates steady.
- While the fed funds rate has likely reached its peak for this tightening cycle, questions remain about the precise timing and extent of potential 2024 rate cuts. **So “soft landing” or not, that’s the question.**
- U.S. economic **growth** remained solid at **3.2%** in Q4 2023 as per Bureau of Economic Analysis’ second estimate of GDP.
- The **unemployment** rate ticked up to **3.9%** in February, up 0.2 percentage points from January, remaining below 4% for the twenty-fifth consecutive month, the longest streak since the 1960s.
- The PCE price **inflation** index excluding food, energy and housing, picked up again in January 2024 with **3.5%** year-over-year growth after cooling in December, moderating, but inflation remains above the FED target and there is a risk that progress could halt or reverse

The Fed's March Dot Plot



Ask ChatGPT what is a Central Bank? (1/2)

"A central bank, also known as a reserve bank or monetary authority, is a financial institution responsible for managing a country's money supply, controlling its monetary policy, and ensuring the stability and integrity of the financial system. Central banks play a crucial role in influencing economic conditions, maintaining price stability, and supporting sustainable economic growth.

Key functions of a central bank include:

Monetary Policy: Central banks formulate and implement monetary policy to achieve specific economic objectives, such as controlling inflation, stabilizing prices, and supporting employment. They often use tools like interest rate adjustments and open market operations to influence the money supply and credit conditions.

Currency Issuance: Central banks have the sole authority to issue and regulate the national currency. They are responsible for designing and distributing banknotes and coins, and they work to ensure the security and integrity of the currency in circulation."

Ask ChatGPT what is a Central Bank? (2/2)

“Banker to the Government: Central banks typically act as the government's banker, managing its accounts, processing transactions, and overseeing the issuance of government debt. They may also advise the government on financial and economic matters.

Banker to Commercial Banks: Central banks provide banking services to commercial banks and may serve as lenders of last resort during financial crises. They regulate and supervise commercial banks to maintain financial stability.

Foreign Exchange Reserves: Central banks manage a country's foreign exchange reserves, holding currencies and assets denominated in other countries' currencies. This helps stabilize the national currency and provides a buffer against external economic shocks.

Financial Stability: Central banks monitor and assess risks to the overall financial system. They may implement policies and regulations to enhance the stability and resilience of financial institutions and markets.

Notable examples of central banks include the Federal Reserve in the United States, the European Central Bank (ECB) in the Eurozone, the Bank of England in the United Kingdom, and the Bank of Japan in Japan. Each central bank operates within the legal and institutional framework of its respective country, and its specific objectives and functions may vary accordingly.”

In sum, not bad for a LLM ...  all this is true...

- A **central bank**, reserve bank, or monetary authority is an **institution** provided with **mandates** to manage the **currency** and **monetary policy** of a country or monetary union. It possesses a monopoly on increasing the **monetary base**. The primary goal of central banks is to provide **price stability** by controlling **inflation**. Many central banks also have **supervisory or regulatory powers** to ensure **financial stability**. Those **economic policies** aim at supporting macroeconomic stability, development and sustainable growth.

BUT.....

- What is **missing** from “**conventional wisdom (ChatGPT)**”?
- “In the age of **Artificial Intelligence** (new technologies, productivity, new labor markets), **Climate Change, Inequality and Populism**”
- The special role of Financial Sector, Credit and Information
- The differences between Advanced Economies and Emerging Market Economies
- The nature of Monetary Policy Frameworks accounting for these differences

Some Questions of this Course

- After having lost some “credibility” (inflation surge 2021-22), should CBs focus just on their main mandate: getting inflation back to their usually “2% target”? And forget about anything else?
- Because major issues we face affect CBs mandates, are global, public and impact the Common Good, (climate change, rising inequality, political instability, digital economy, AI), CBs cannot stay on the sidelines; interpret or change mandates?
- What new tools CBs have to do a better job? LLMs, AI, new monetary policy frameworks, new institutional arrangements (governance)?

Leaders | Fool me once

Central banks have spent down their credibility

That will make inflation trickier to handle in future

- After decade of “missing” target undershooting inflation, surge in inflation 21-22 was a “surprise” for CBs
- Now overshooting CBs’ inflation targets (2%); results also badly “missed” and work still not completed
- To regain credibility total, undivided focus on main mandate of price stability
- KISS principle

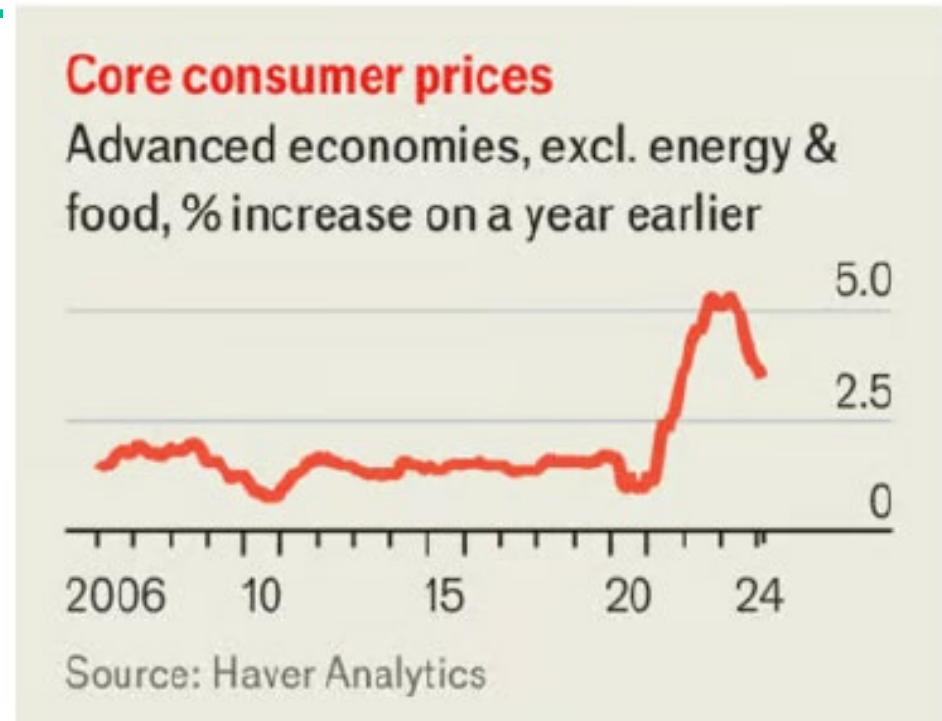


CHART: THE ECONOMIST

The Economist, 3 April 2024

- Mandate of price and financial stability are at risk with Climate Change (already now, extreme weather events, much worse later if no action)
- CBs have mandate to address the CC issue in coordination with other important actors (Governments, private sector, civil society, etc)
- CBs can provide directions, methodology, scenarios, models, conferences, even use some of their instruments to address CC (BIS, Network for Greening the Financial System)



The green swan

Central banking and financial stability in the age of climate change

Patrick BOLTON - Morgan DESPRES - Luiz Awazu PEREIRA DA SILVA
Frédéric SAMAMA - Romain SVARTZMAN

January 2020

Chapter 1 - Introduction

Keynote speech

1 JUNE
15:05 - 15:20
CEST



Mark Carney
UN Special Envoy for Climate Action and Finance



Al Gore

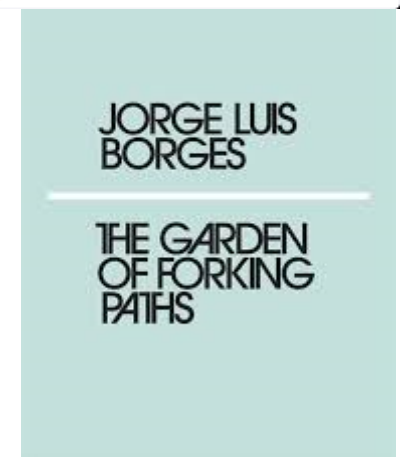
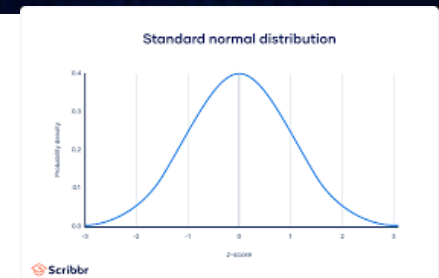
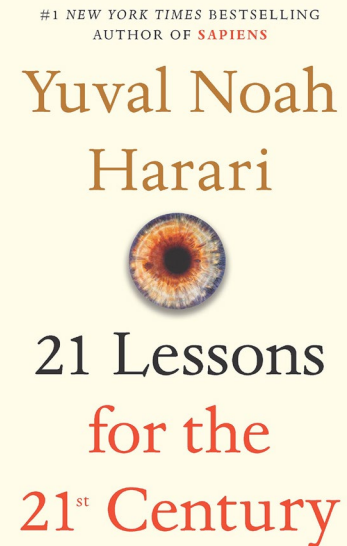
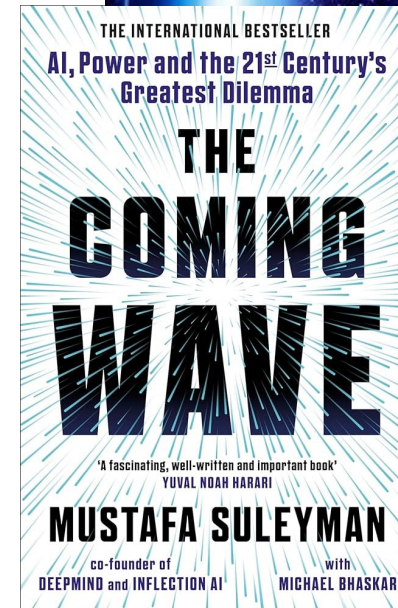
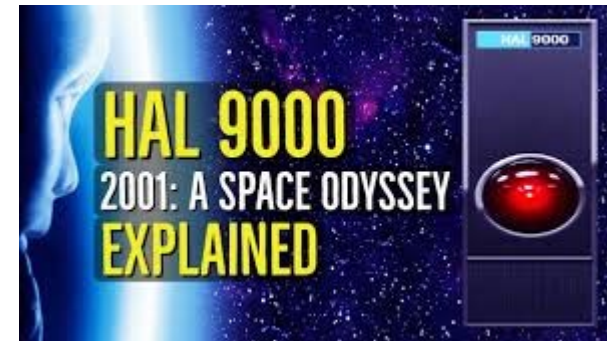


Nicholas Stern
IG Patel Professor of Economics and Government and Chair of the Grantham Research Institute on Climate Change and the Environment, London School of Economics



Joseph Stiglitz
Professor, Columbia University

- AI, Algos, LLMs, big data are already changing many tasks in real economy, work processes, scenario design, models, financial decisions, etc.
- The **convergence of an algorithm**, refers to the process where successive iterations get progressively closer to a specific value, often a solution or optimal set of parameters for the problem at hand.
- CBs use economic data inputs, performs model projections, forecast inflation, and take policy interest rate decisions largely based on “convergence to 2% inflation target”; then CB communicate with markets on process and future decisions.
- Can CB work be summarized by a simple algo LLM process? Or is there “human judgement”? Later, can an AI-LLM CB do better, forecasting and communicating? Can a “singularity” moment occur?



S1 Outline and about Economic Policy Making

- Objectives, Instruments and Institutions of policy making
- Trade-offs and structural reforms
- Functions of economic policy / public interventions
- Motivation for policy / public interventions
- Limitations to policy making
- Useful “new” issues for policy (digital “money”, capital flows, inequality)

S 2: Shocks and crises in the 20th & 21st century as illustration of policy challenges for CBs

- 21st century new shocks: Global Financial Crisis (GFC), the Covid-19 pandemic, the War in Europe, the 2021-22 surge in inflation.
- Old 20th century crises, macroeconomic populism, sudden stops of capital flows and effects on Emerging Market Economies (EMEs) policy responses
- Financial globalization, innovation and credit populism: the Asia Financial Crisis
- Digital finance, new payments systems, the new Silicon Valley Bank (SVB) type runs

S 3 : Why do you need central banks? Stabilization functions, Price & Financial stability

- Nature and functions of monetary policy, why do you need central banks?
- Objectives of monetary policy: price stability, stabilization of activity, exchange rate stability and financial stability
- Short History of central banks
- The evolution of central bank functions, mandates, institutional arrangements and governance structures.

S 4 : Monetary Policy

- The nature and the role of monetary policy and its instruments
- Transmission channels of monetary policy (interest rate, asset prices, credit, exchange rate)
- Monetary policy regimes (Gold Standard, Monetary Aggregates, Anchor Exchange Rate, Inflation Targeting).
- How does monetary policy operate at the Zero Lower Bound (ZLB), unconventional tools and new approaches (quantitative easing, forward guidance)
- Interaction between monetary and fiscal policies

S 5 : Financial Stability

- History of finance and role in development
- Financial structures and financial instruments and tools (debt, bonds, securitization)
- Financial stability and the risks of financial crises
- Types and institutional arrangements for banking regulation and supervision; capital market regulation
- Micro and macro-prudential regulation
- The future of financial stability in the digital world

S 6 : Inflation Targeting

- The origin of inflation targeting (IT) as a new monetary policy regime
- The features and institutional set-up of IT, flex IT: central bank credibility and independence
- The objective, process and instruments: target for inflation, policy rate, monetary policy committee (MPC), communication and anchoring expectations
- The results in the 1990s: the Great Moderation of inflation

S 7: Challenges for traditional flex IT in EMEs

- Initial conditions in EMEs implementing flex-IT
- Performance of EME with IT
- Challenges to EME with IT (credibility, fiscal, shocks, capital flows and exchange rate volatility)
- Accounting for financial stability in EMEs with IT regime

S 8: Integrated Inflation Targeting (IIT): a response to the new challenges?

- The “pragmatic” policy response of flex-IT EMEs and the rationale for Integrated Inflation Targeting (IIT)
- Designing and implementing Integrated Inflation Targeting (IIT) regimes (as new macro-financial stability policy frameworks)
- Examples of IIT at work during three episodes
- Policy lessons for Integrated Inflation Targeting (IIT)

S 9 : Macro-Financial Policy Analysis under IIT

- Policy and adjustment program design under IIT frameworks
- Examples of simple closed and open economy models and coverage of policy instruments by pairs
- Policy Responses to External Financial Shocks: Country Experiences

S 10: Central banks and the digital revolution: fintech, DeFi, crypto assets

- New money or crypto assets? Fintech and DeFi: the progress and the risks
- Digital technologies and the role in better measurement of risk in credit markets with Big Data and digital ID
- Fast payments systems, CBDC, new insurance mechanisms
- Financial inclusion and exclusion
- Public platforms, inter-operability and the potential for new financial public goods

S 11: Central banks in the era of Climate Change (CC): Green Swans

- The evidence about CC in the IPCC reports
- Characteristics of a new systemic risk, Green Swans as opposed to the GFC's Black Swan: irreversible, non-linear, life threatening; financial consequences of physical and transition risks
- Why should central banks bother? Their financial stability objective; should they ask for a new explicit mandate?
- Policy responses
- Financing the transition to net zero

S 12 : Central banks and inequality hysteresis

- The various dimensions of inequality (income, wealth, opportunities, etc)
- A brief history of the construction of the Social Welfare State
- The rise in income inequality in the last 40 years and causes
- Why should central banks bother? Inequality and loss of effectiveness in monetary policy; deeper recessions and loss of policy transmission
- The short-term effects and cyclical dimensions: inequality hysteresis
- The policy consequences

S 13: Group debates for evaluation

- Role of CB and MP, asked to do more since GFC, Covid, War; credibility challenges (inflation “last mile”)
 - Blurred boundaries between fiscal and monetary policies (APP); higher debt levels; socio-political polarization
 - International coordination, spillover of MPs in EMEs (IIT regimes, etc)
 - Green agenda and sustainability
 - Digital agenda, algos, AI
- Keep same MP framework? Add new mandates? Help from new models, AI? Back to basics?

S 13 & S14 Evaluation of Course

- 50% - Session 13 with general discussion on CB topics covered during the course; technical debate and presentation on one specific policy issue at hand; two groups (“pros” and “cons”; “now” or “later”; etc); how would each group recommend policy course of action to Government
- 50% - Session 14 individual short written essays, announced beforehand, among themes of the course

Examples of groups debate:

- **1) Should the FED cut its policy rate, yes, no, by how much, when?** (March 20, 2024, Federal Reserve issues FOMC statement, release at 2:00 p.m. EDT: *“The Committee decided to maintain the target range for the federal funds rate at 5 ¼ to 5 ½ percent. In considering any adjustments to the target range for the federal funds rate, the Committee will carefully assess incoming data, the evolving outlook, and the balance of risks. The Committee does not expect it will be appropriate to reduce the target range until it has gained greater confidence that inflation is moving sustainably toward 2 percent.”*)
- **2) At some point, can the FED’s job be done by AI?** “ChatGPT can assist with many tasks, including some related to economics, finance, and data analysis, which are relevant to the Federal Reserve's (Fed's) functions. However, doing the Fed's job involves a wide range of complex and critical responsibilities that go far beyond what any AI, including ChatGPT, can manage.”

S1 Outline Economic Policy Making

S 1.1 Objectives, Instruments and Institutions of policy making

S 1.2 Trade-offs and structural reforms

S 1.3 Functions of economic policy / public interventions

S 1.4 Motivation for policy / public interventions

S 1.5 Limitations to policy making

S 1.6 Useful “new” issues for policy (digital “money”, capital flows, inequality)

S 1.1 Objectives, Instruments and Institutions (Tinbergen principle)

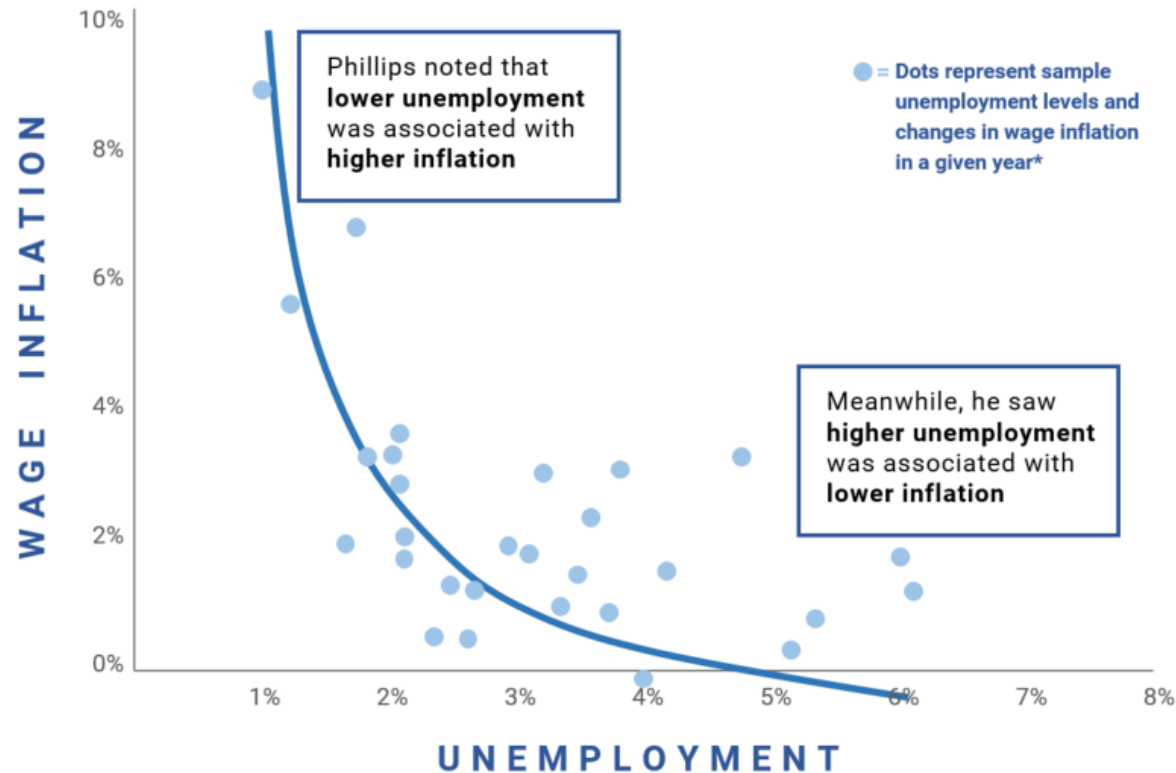
- Numerous objectives (“low and stable inflation”, “full employment”, “sustainable growth”, “well-being of societies” etc) sometimes with inconsistencies and contradictions
- Numerous instruments (policies): monetary policy (setting CB policy rate), fiscal policy (level and composition of public spending), taxation (types, level), transfers, trade policy, competition, etc
- Numerous institutions to conduct policies: the CB, the Treasury, ministries, public agencies, etc (sometimes not well coordinated)
- Tinbergen principle: assign one objective/policy to be addressed by one instrument (and under the responsibility/mandate of one institution)

S 1.2 Trade-offs, structural reforms and potential output

- When objectives > instruments (eg., price and financial stability, fiscal balance, higher growth, sustainability, no poverty, etc), some objective would have to be “traded” against another; famous example, the Phillips curve (wage inflation x unemployment)
- To improve outcomes of trade-offs (eg., no poverty x fiscal balance), economic policy can change institutions and conduct “structural reforms” that will add more resources to be shared
- Such “structural reforms” increase “potential output” and can provide the basis for better social arrangements (but can have different short-term x long-term redistributive consequences)

UNDERSTANDING THE PHILLIPS CURVE

In the 1950s, A.W. Phillips plotted decades' worth of data on wage inflation and unemployment. He noticed an inverse relationship between these two indicators.

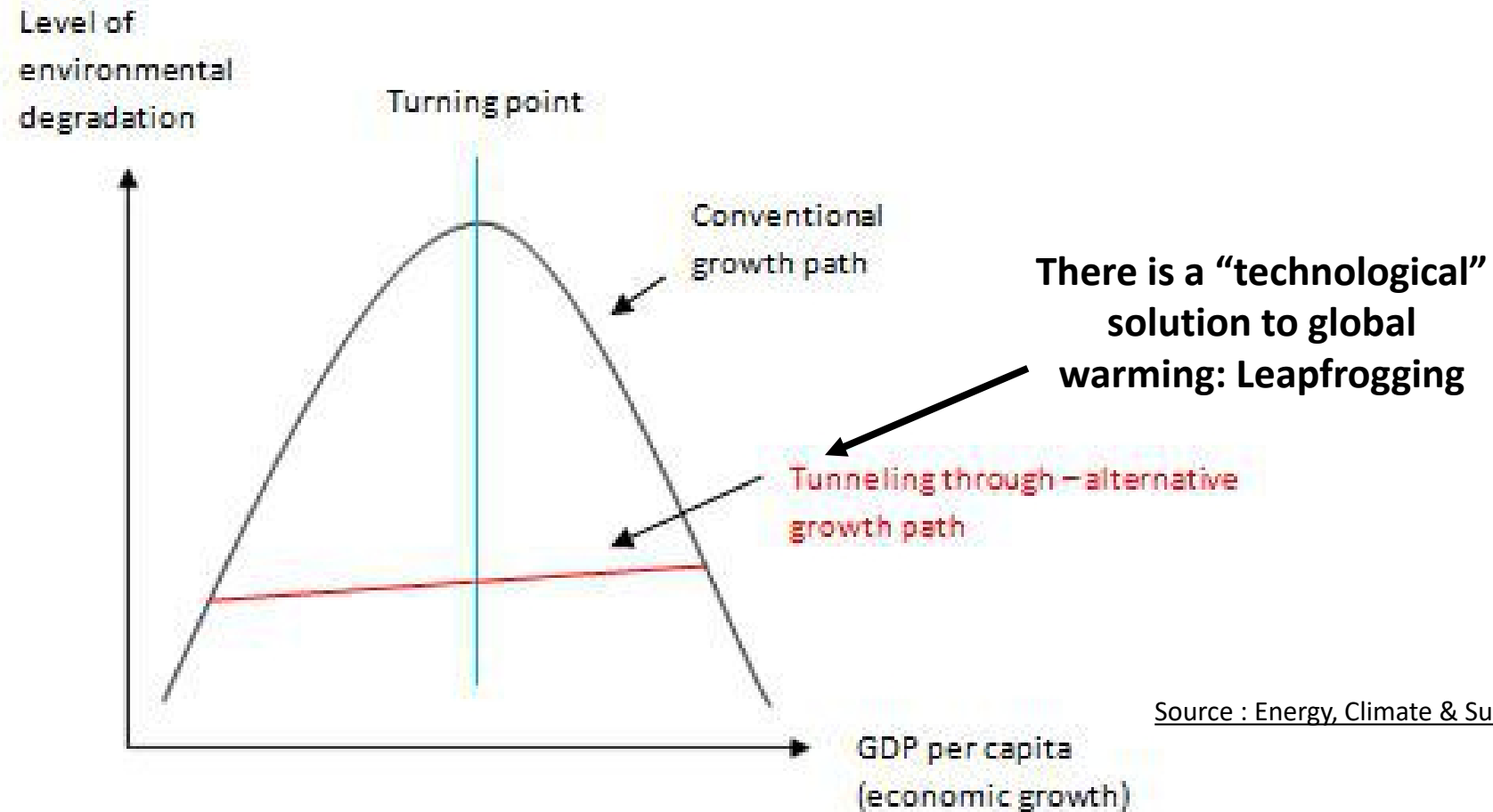


BUT WHY?

The idea may seem intuitive: A lower unemployment rate means more people are working, which signals increased demand for labor. That can put upward pressure on wages, so companies may raise prices for their products. But the inverse relationship Phillips described has "flattened" in recent years, prompting debate among economists and policymakers.

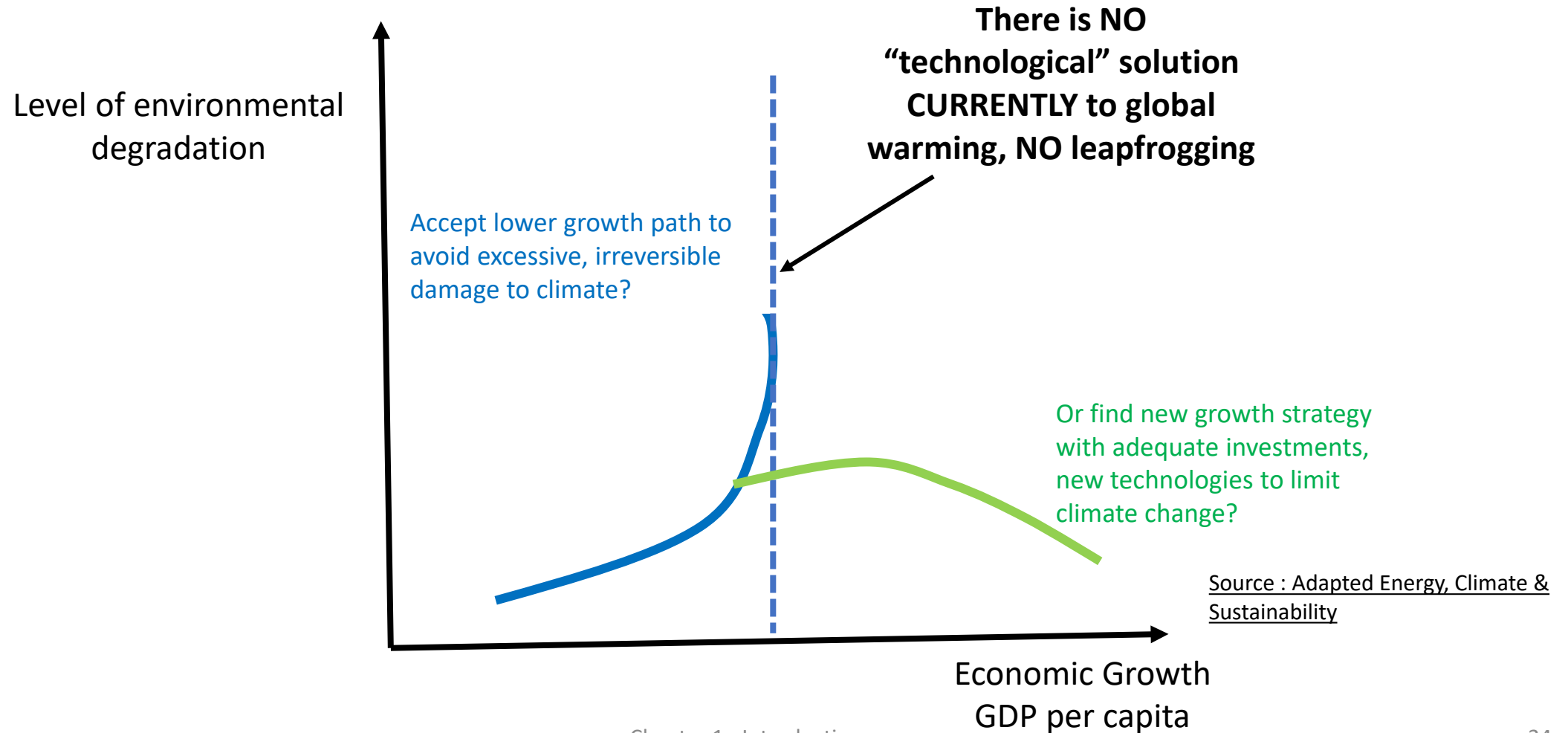
*This illustration is intended for conceptual purposes only. It's partly modeled on the Figure 1 scatterplot on Page 285 of Phillips' 1958 paper, which contained 1861-1913 data. Each dot represents a year. The vertical axis shows the average rate of change of money wage rates; the horizontal axis shows average unemployment.

Is there a trade-off growth x environment? Can (should) Central Banks bother?



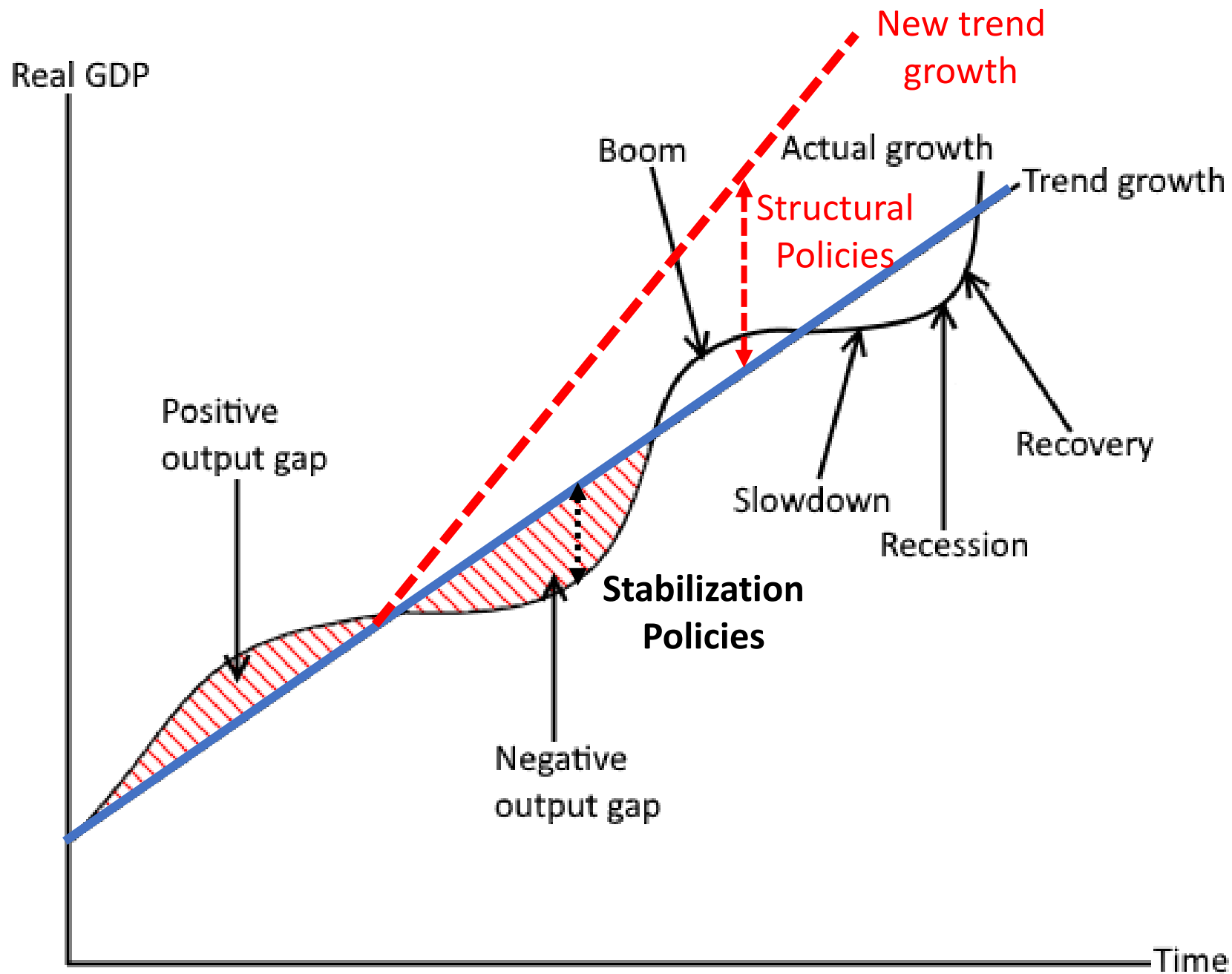
Source : Energy, Climate & Sustainability

Is there a trade-off growth x environment? Can (should) Central Banks bother?



S 1.3 Functions of policy / public interventions

- S 1.3.1 Allocation policies
 - Improve / optimize the available resource assigned to different usages (eg., types of capital, types of labour –skilled or unskilled, natural resources, different technologies, etc)
- S 1.3.2 Stabilization policies
 - Bring the economy to both internal and external macroeconomic balance (price stability and full employment, trade and BoP balance) using monetary and fiscal policies
- S 1.3.3 Redistribution policies
 - Improves the incomes of agents or regions by transferring resources between them to correct the primary distribution of income (eg., social transfers, subsidies, progressive taxation of income and wealth, etc)



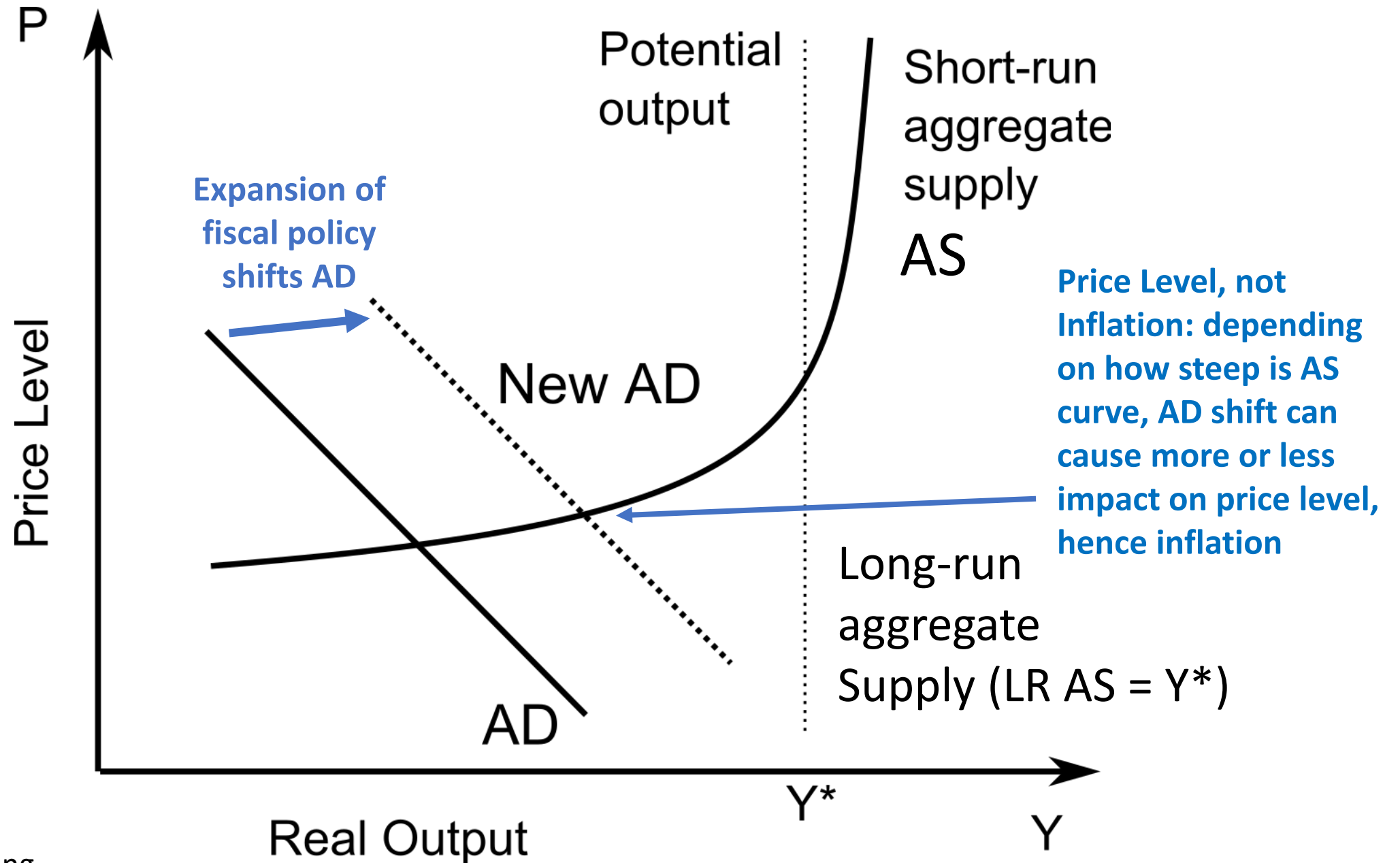
Source: adapted from Edexcel Economics Revision

S 1.3.2 Focus on Stabilization Policies (1/5)

- Why stabilize? Animal spirits (Keynes)
 - Limit deviation from “efficient” long run “market equilibrium” output trend; inherent private investor behavior exuberant or gloomy; too volatile
 - Financial markets illustrate this with booms and busts, financial cycles
- Why stabilize? Nominal rigidities (Keynes)
 - Rigidity of nominal wages and prices prevents self-correction of recessions; rationale for countercyclical monetary and fiscal policies to smooth fluctuations
 - Controversy 1970-1980s with Monetarism about relevance and usefulness of policy interventions

S 1.3.2 Stabilization Policies (2/5)

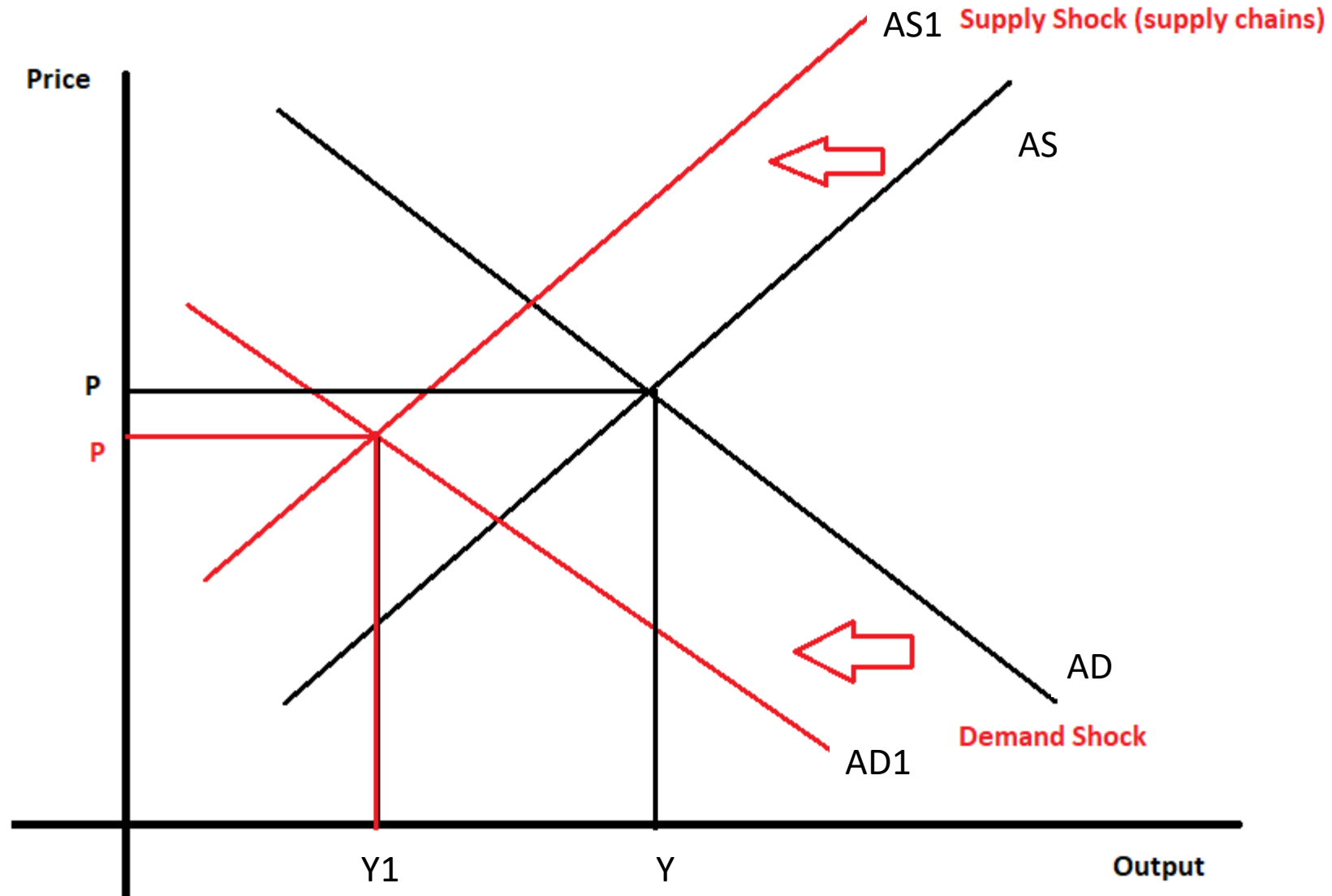
- Aggregate demand-and-supply framework (AS-AD)
 - Represent economy under space output x prices, relation between aggregate output (Y) and product price level (Supply - AS) and aggregate demand and product price level (Demand - AD)
 - ST: AS curve positive slope (nominal rigidity for wages, rise in price reduce real wage, production more profitable rises)
 - AD curve negative slope (rise in price reduce wealth/asset value, reduce consumption)
 - LT: AS curve fixed/vertical (maximum labor/resources employed)



S 1.3.2 Stabilization Policies (3/5)

- Supply and demand shocks
 - Supply shock: exogenous change between supply and price level in AS curve (eg., (a) negative supply shocks, “oil price jump” reduce Y , increase in price reduce profitability of production, AS shifts to the left; or Covid shock cut supply chains; (b) could be also positive supply shock, productivity increases
 - Demand shock: exogenous change between demand and price level in AD curve (eg., (a) negative demand shock, fall in consumption due to loss in wealth/assets, AD shifts to the left; or Covid shock reduce demand due to lock downs ; (b) could be also positive demand shock

Potential Short-Term Impact Of Coronavirus On Global Economy



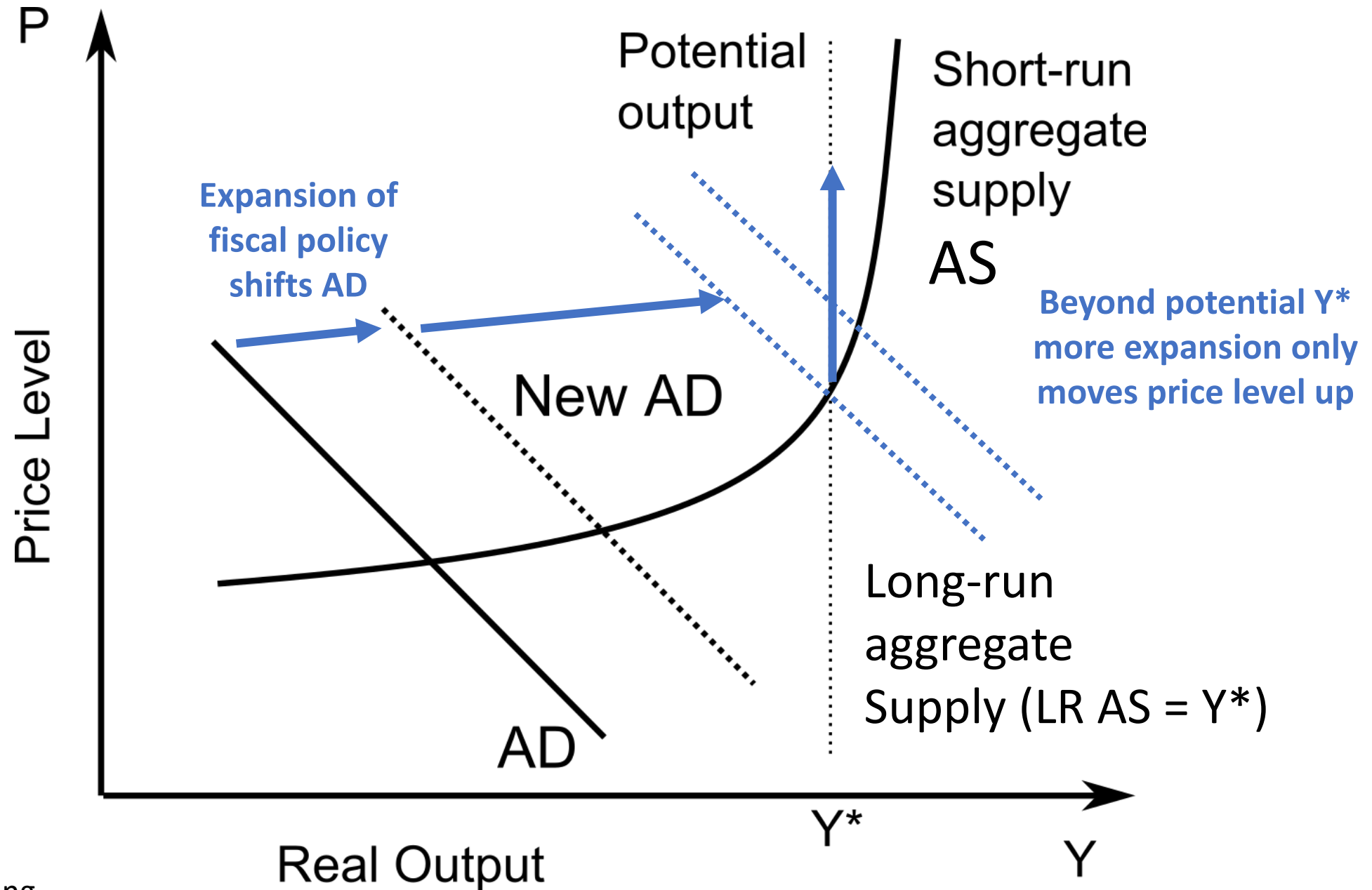
Source: Custer Consulting Group

S 1.3.2 Stabilization Policies (4/5)

- S 1.3.2.e Both supply and demand shocks can increase or decrease output but it is important to distinguish between them because they have different policy implications
 - In the ST a positive demand shock: AD shifts to right (higher output + higher price); positive supply shock: AS shifts to right (higher output BUT lower price, eg., productivity gains)
 - In the LT AS curve is vertical (potential output is the limit, maximum that can be produced at given conditions); in LT any positive demand shock only move price level up

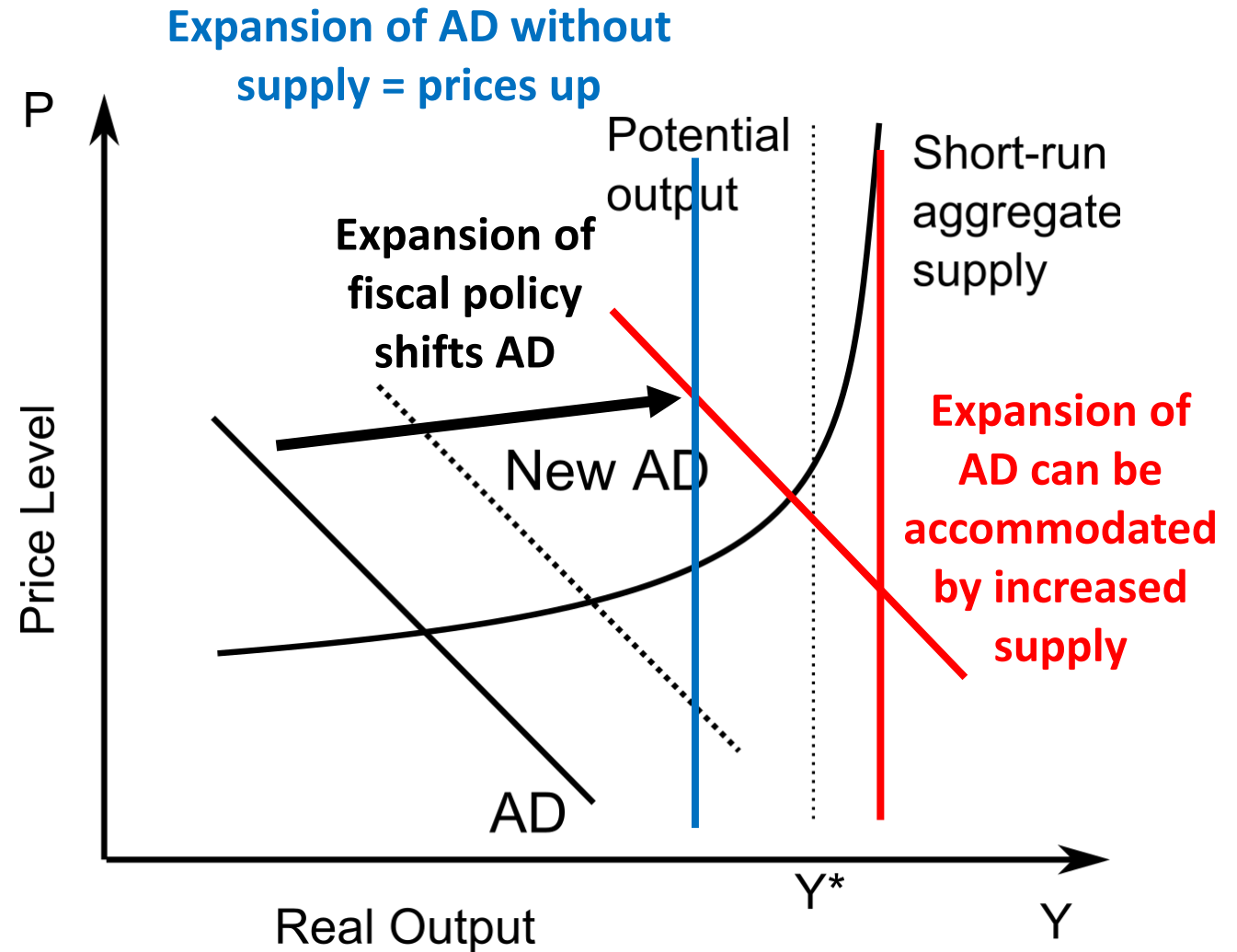
S 1.3.2 Stabilization Policies (5/5)

- Demand shocks do not change output in ST or move it in the same direction as prices; supply shocks move price in opposite direction to output (i.e., negative supply shock = price up; positive supply shock = price down)
- AS-AD framework suggests limits to stabilization policies
 - in ST, instruments (fiscal and monetary policies) affect demand AD curve and can smooth demand contraction (eg., stimulus after 2009 GFC, Covid)
 - For supply shocks (eg., oil crisis), AS shift to left, demand policy instruments pushing AD to right in ST can increase price and in LT is ineffective without structural reforms affecting AS



Usual debate between “left” and “right”

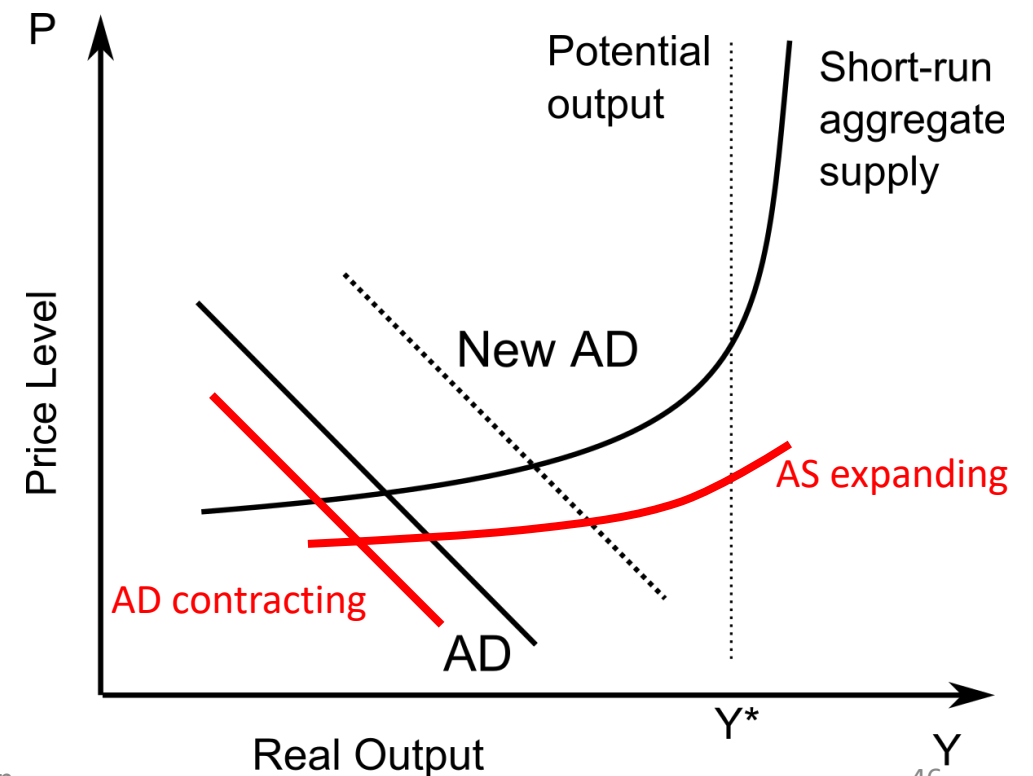
- Simplifying (**left**): AD expansion can be done to benefit growth and redistribution; it can be coupled with adequate expansion of AS (more investment) to shift potential output to right and avoid hitting constraint that will end-up in more inflation; result is higher output and moderate inflation
- On the contrary (**right**): too much AD expansion is seen as destabilizing; lags to expand AS and uncertainty contracts investment (AS shift to left) and cause anticipation of shortages and increases inflation; result is lower output and much higher inflation



- Facing growth slowdown, difficulties in construction sector, China's response is a strategy called "new productive forces", new tech, mass production of electric cars, batteries, biomanufacturing, etc, worth \$1.6 trillion (AS shift right)
- Not much done for domestic AD (typical Keynesian solution for workers) for consumers (AD contracting, due to losses of property slump, savings up); private domestic investment made more difficult due to more controls
- Excess supply will need to find place of disposal: the rest of the World; that is already triggering complaints of "unfair" competition

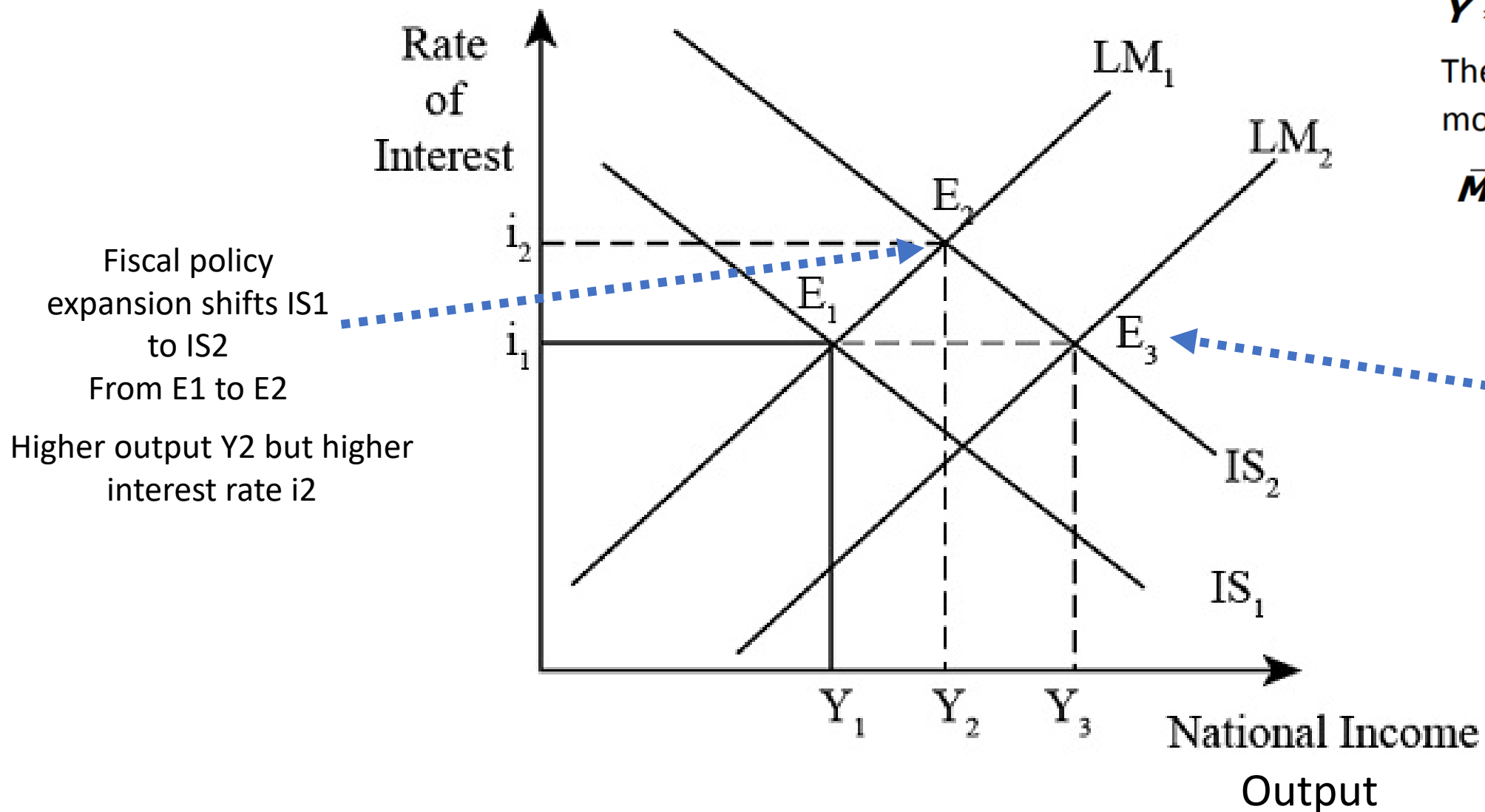
Xi Jinping's misguided plan to escape economic stagnation

It will disappoint China's people and anger the rest of the world



S 1.3.2 Internal Stabilization with IS-LM framework

- With price stickiness and without substitution between private and public spending, demand stabilization policies (fiscal and monetary) can be represented in AS-AD framework; but AD curve (**demand side**) can be summarized in IS-LM model (Hicks-Hansen formalization of Keynes)
- IS-LM in output (Y) and interest rate (i) space:
 - IS curve depicts points (i, Y) of goods/output equilibrium (negative slope, higher i decreases demand for goods;
 - LM curve depicts points (i, Y) of money market equilibrium (positive slope, demand for money increases with output and decreases with i , preference for assets rather than money)
- Fiscal policy shifts IS to the right: more demand for goods; but new equilibrium entails higher r for LM curve to balance money market
 - Fiscal multiplier effect maximized by accommodative monetary policy (shift back LM curve to initial interest rate, fiscal dominance)
 - Independent CB may not accommodate, higher spending requires higher i

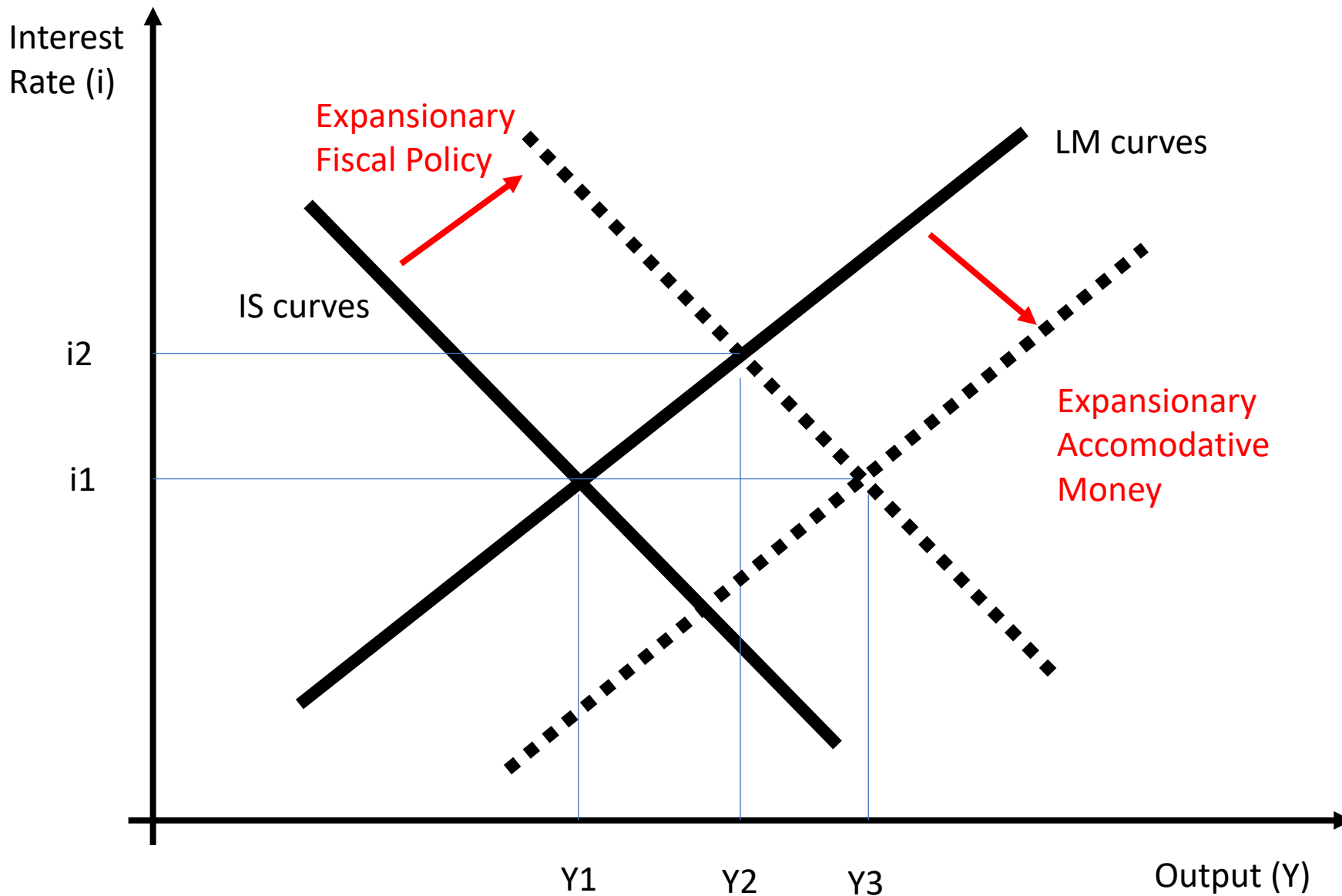


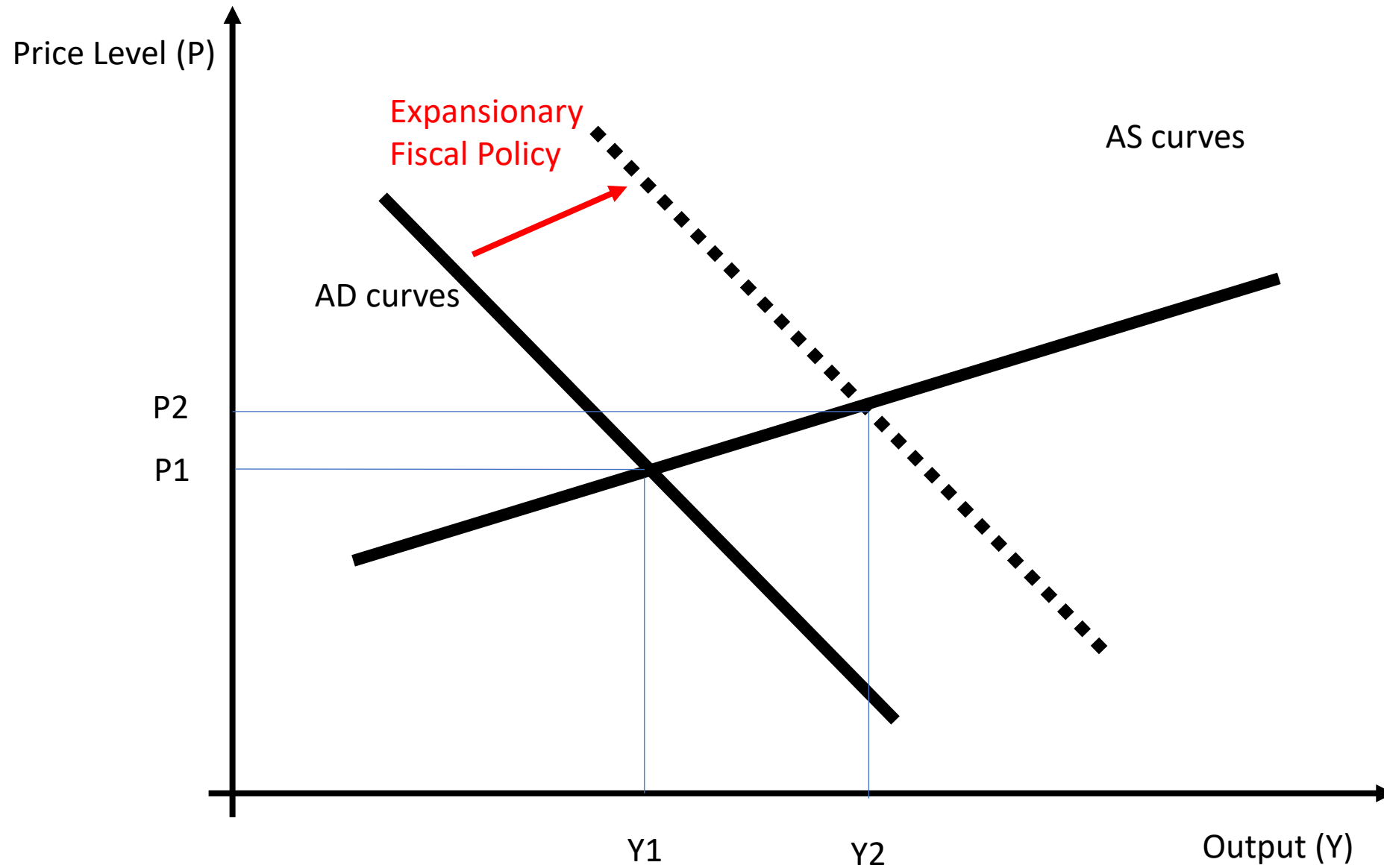
The IS curve represents equilibrium in the goods market.

$$Y = C(Y - \bar{T}) + I(r) + \bar{G}$$

The LM curve represents money market equilibrium.

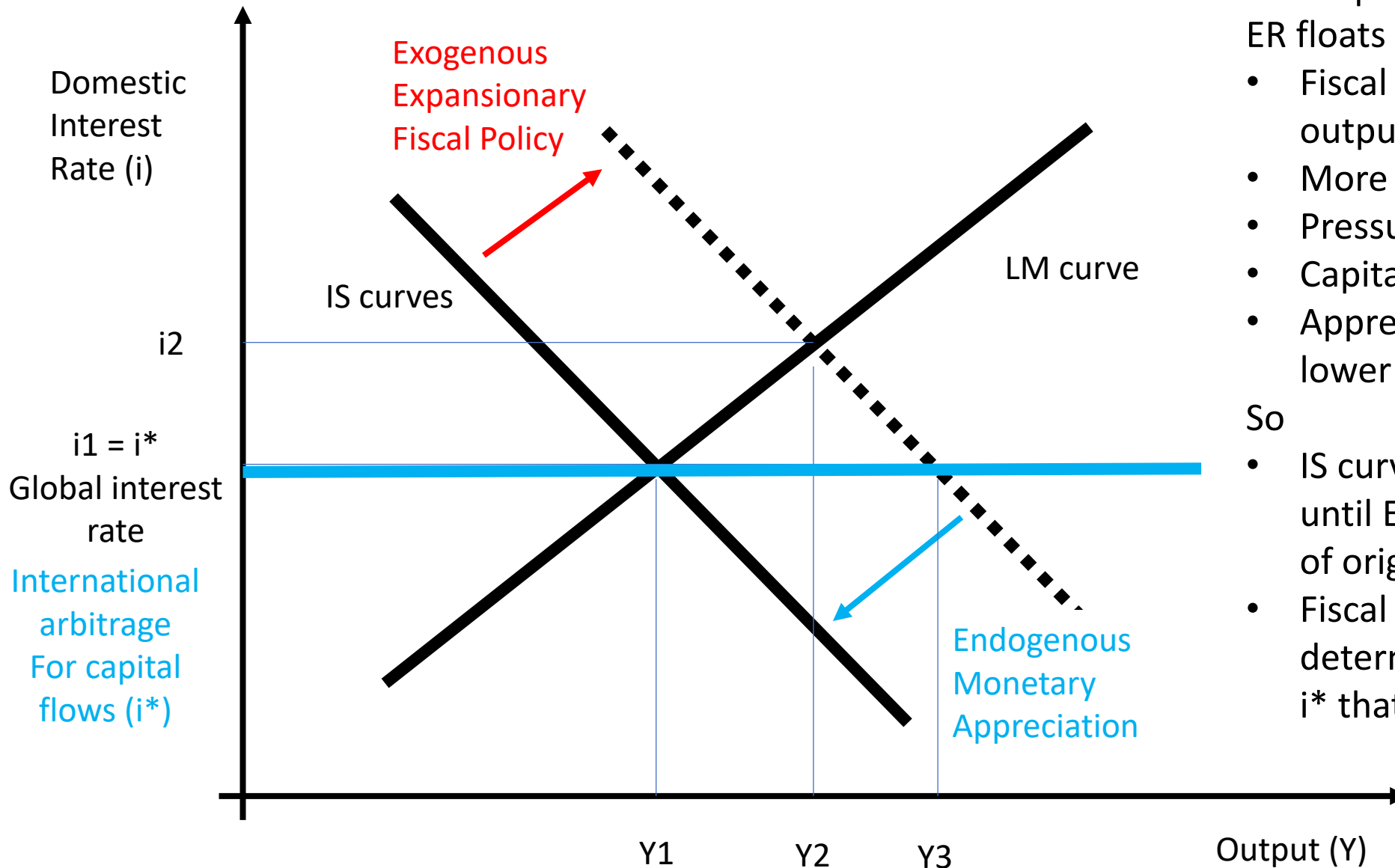
$$\bar{M}/\bar{P} = L(r, Y)$$





S 1.3.2 External Stabilization with Mundell-Fleming framework in small open economy

- So far, framework AS-AD or IS-LM **in closed economy**.
 - For **open economy**, need external equilibrium;
 - Three conditions (+BOP) not two (IS+LM) for equilibrium
 - Key ER regime; and capital mobility regime
-
- SOE usually perfect capital mobility: domestic interest rate cannot deviate from global interest rate, otherwise, arbitrage make capital flow in or out



Floating ER regime:

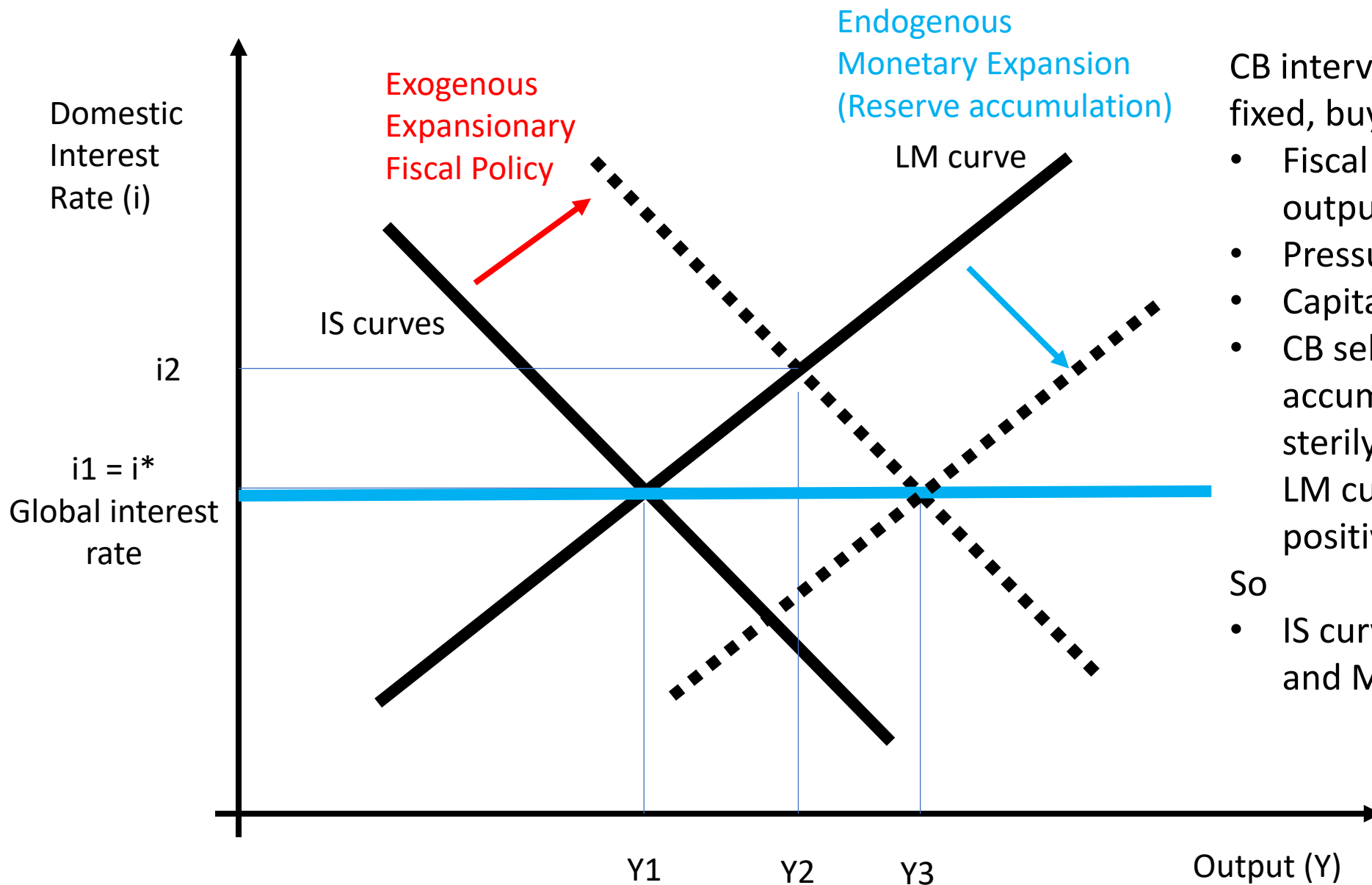
CB keep M supply fixed (LM curve)

ER floats

- Fiscal expands to aim at higher output Y_2 and income
- More demand for money M (fixed)
- Pressure on interest rate (LM)
- Capital flows in, higher $i_2 > i_1$
- Appreciation of ER (loss of X , lower demand for its products)

So

- IS curve shifts back (less demand) until ER appreciates to equilibrium of original position (Y_1 , $i_1 = i^*$)
- Fiscal expansion and IS don't determine level of Y ; it's the MP of i^* that matters



Fixed ER regime:

CB intervenes in FX market to keep ER fixed, buying and selling FX v-a-v LC

- Fiscal expands to aim at higher output Y_2 and higher income
- Pressure on interest rate (LM)
- Capital flows in, higher $i_2 > i_1$
- CB sell LC buys FX to keep fixed ER; accumulates reserves; not sterilized, that increase M supply; LM curve moves right; then positive effect on Y

So

- IS curve and fiscal policy effective and MP is ineffective

S 1.3.2 MP and role of Capital Flows: interest rate differential, pull and push factors

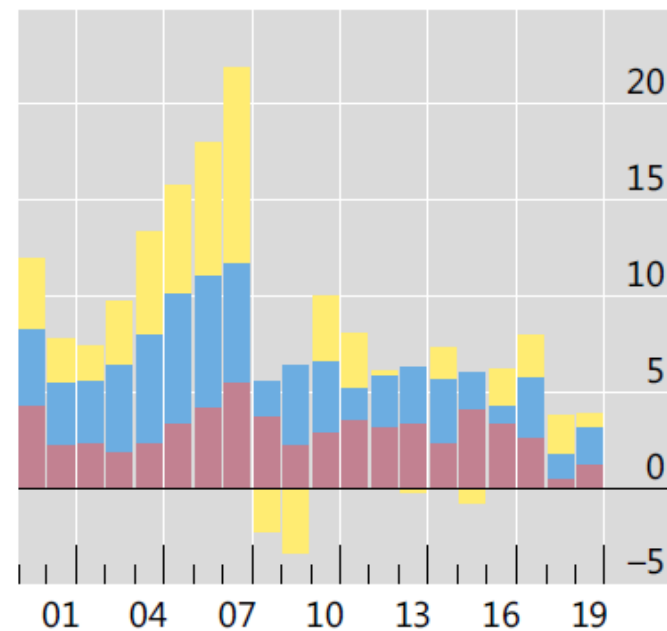
- Open capital account, capital flows interact with domestic MP through FX; ER and capital flows important for policy-making especially in EMEs but not only; they can be “volatile”
- Different flows: portfolio (ST), direct investment (LT) and debt (ST/LT)
- Determinants of flows, role of MP in AEs (especially US and FED):
 - Growth and interest rate differential between home and “the US”, ER regime
 - Liquidity conditions, relative risk, commodity prices, trade-financial openness
 - Quality of institutions, political economy conditions and social stability

Capital flows by type and region

As a percentage of world GDP

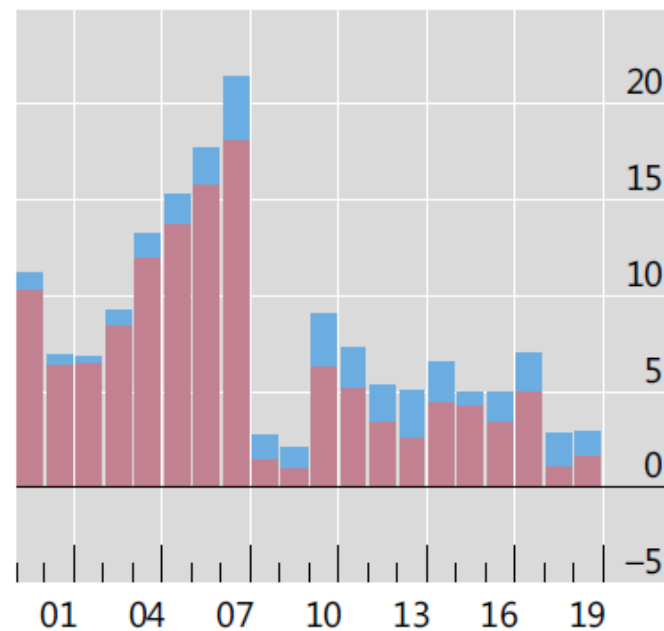
Graph 1.1

Worldwide inflows by type



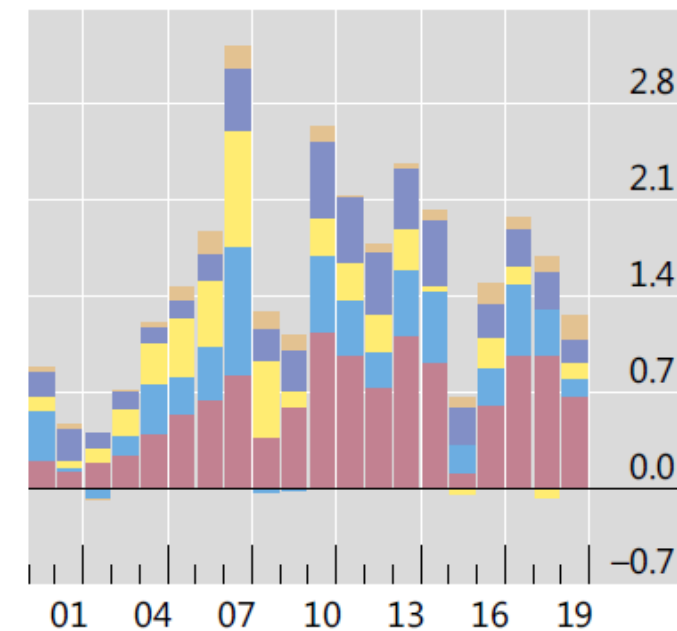
Investment type: Direct
Portfolio
Other NB. Other = Bank loans

Worldwide inflows by region



AEs EMEs and financial centres

Inflows to EME regions

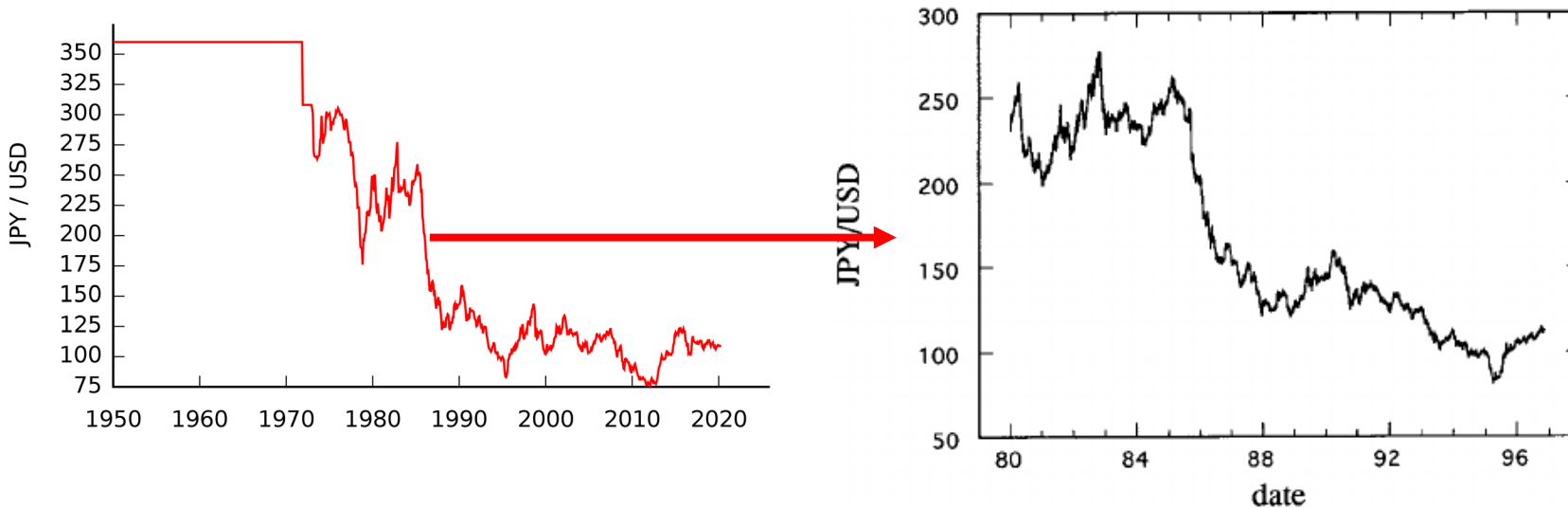


Asia Europe Middle East and Africa
Financial centers Latin America

AEs = advanced economies; EMEs = emerging markets; Financial centres = Hong Kong SAR and Singapore; Emerging Asia = CN, IN, ID, MY, PK, PH, TH; Emerging Europe = CZ, HU, PL, RO, RU, TR; Latin America = AR, BR, CL, CO, MX, PE; Middle East and Africa = EG, SA, KW, QA, ZA.

Sources: IMF, *Balance of Payment Statistics*; CGFS Working Group calculations.

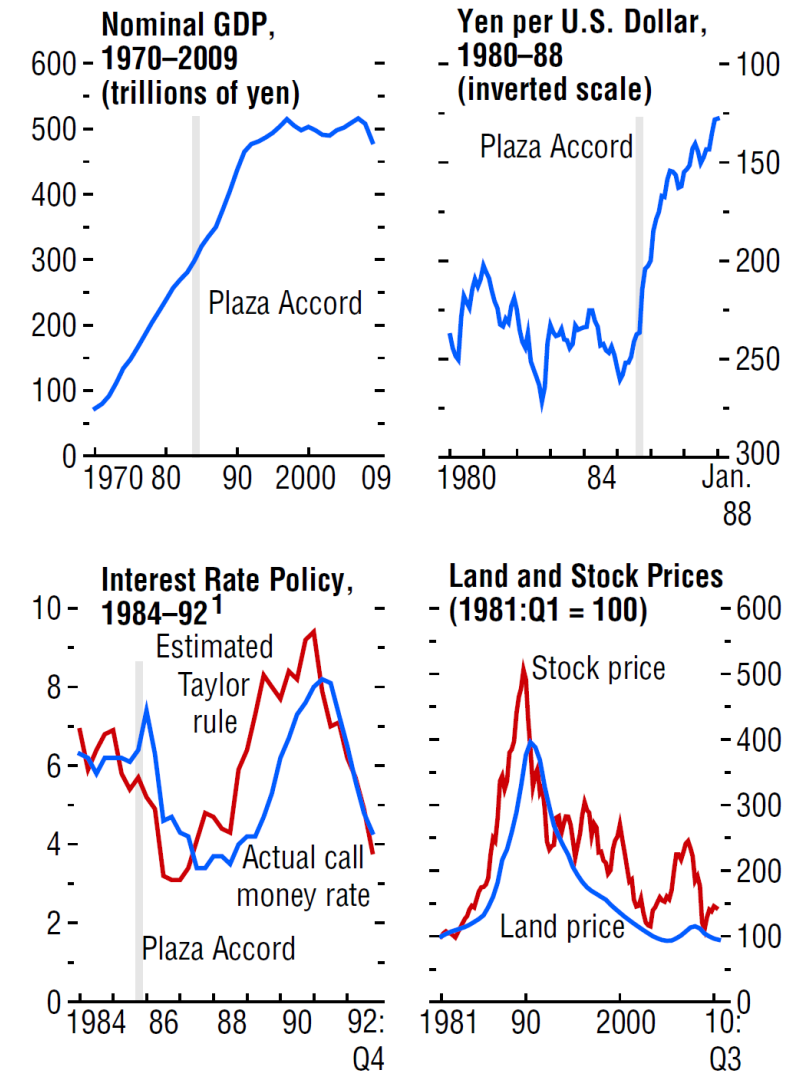
ER, Capital Flows, Plaza Accords JPY x USD



US had “solved” their inflation surge of the 1980s (Volcker); put pressure on surplus countries (Germany, Japan) to strengthen their currencies, depreciate the USD. But “stronger” Yen might have caused fear of recessionary pressures and prompted massive expansionary fiscal and monetary policies in Japan that created conditions for Japan’s property “bubble” and then the “lost decade”

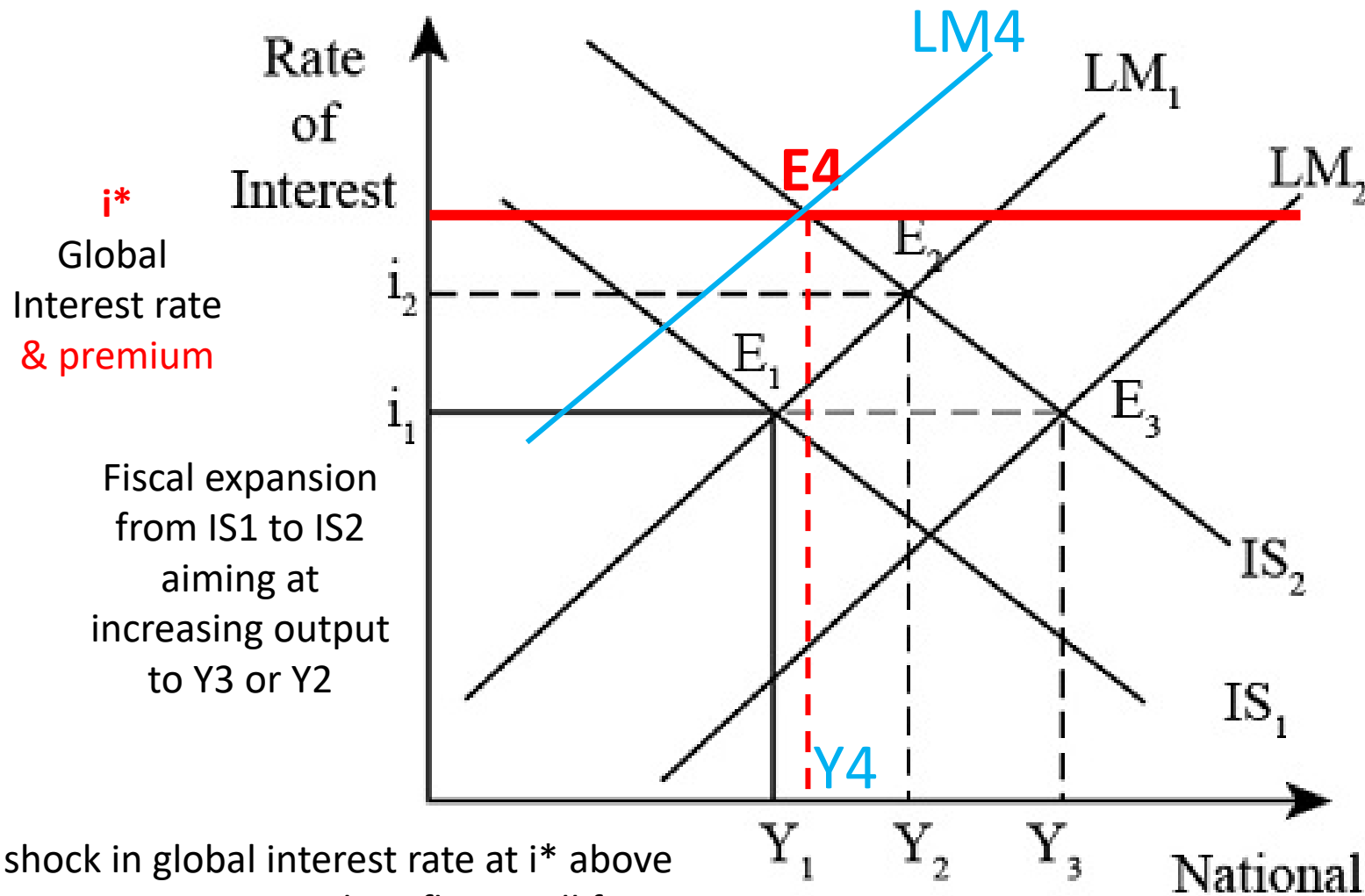
Source [http://www.stat-search.boj.or.jp/ssi/cgi-bin/famecgi2?cgi=\\$nme_a000&lstSelection=FM08](http://www.stat-search.boj.or.jp/ssi/cgi-bin/famecgi2?cgi=$nme_a000&lstSelection=FM08)

Figure 1.4.1. Japan: Selected Macroeconomic Indicators



Sources: Bank of Japan; Cabinet Office (Japan); Haver Analytics; and IMF staff estimates.

Fixed Exchange Rate Regime



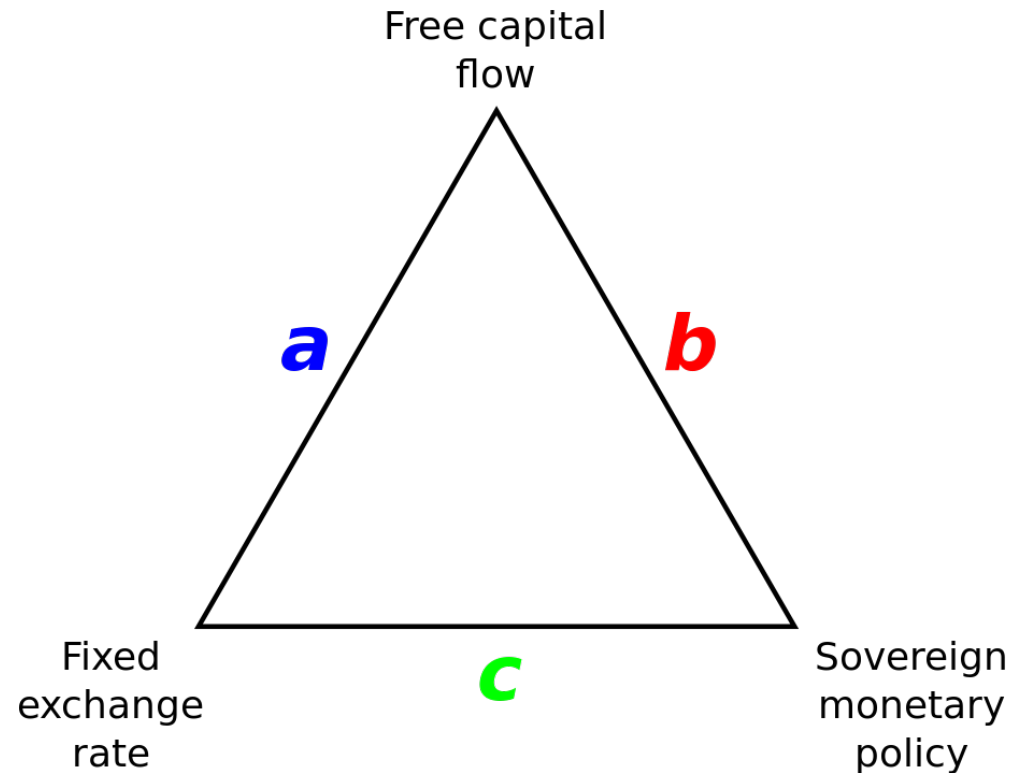
EMEs and fixed ER
could be subject to
“forced
contractionary”
policy response

E_2 or E_3 =
Equilibrium under
domestic
monetary policy
Accommodative
or not

But if shock in global interest rate at i^* above domestic interest rate, capital outflows will force CB do reduce money supply and shift LM_4 curve to new equilibrium E_4 , contractionary below E_2 and E_4

S 1.3.2 External Stabilization with Mundell-Fleming framework (Impossible Trinity or Trilemma)

- Option (a): A stable exchange rate and free capital flows (but not an independent monetary policy because setting a domestic interest rate that is different from the world interest rate would undermine a stable exchange rate due to appreciation or depreciation pressure on the domestic currency).
- Option (b): An independent monetary policy and free capital flows (but not a stable exchange rate), hence floating.
- Option (c): A stable exchange rate and independent monetary policy (but no free capital flows, which would require the use of capital controls)



S 1.3.2 Economic Policy **still** mainly conducted under AS-AD or IS-LM-BOP-MF

- Internal balance objectives attainable with a well calibrated policy-mix of fiscal and monetary combination (*and regulation and rules*)
 - Price stability (but no role for expectations)
 - Financial stability (only money market, no financial sector and no asset markets)
 - Debt and fiscal sustainability (but no debt market)
- External balance objectives attainable achieving internal balance and (*with flexible exchange rate regime and proper regulation*)
 - Sustainable current account (but assumption of clearing fixed ER at equilibrium)
 - Open capital account with proper financial sector policies (macropru, CFMs)
 - Adequate reserves (but no role for FXI and no asset market)

S 1.4 Motivation for Policy Interventions

- S 1.4.1 Competition is imperfect
 - Conditions of theorems of Welfare Economics not met, competitive equilibrium may not be Pareto optimum (inequality of income but difficult to do lump-sum transfers); monopolies with large market power
- S 1.4.2 Externalities
 - Private cost not social cost (eg., pollution and climate change not included in consumer price; R&D has positive spillovers but financial crisis negative, etc)
- S 1.4.3 Information is imperfect
 - Agents can hide true condition (eg., risk of borrowers from banks)
- S 1.4.4 Markets are incomplete
 - Access to credit/insurance not possible for groups (eg., youth, minorities, etc)

S 1.5 Limits to Policy Intervention (1/3)

- S 1.5.1 Models, risks, uncertainty and expectations
 - Parameter calibration in models for policy (eg., Keynesian multiplier; discount rate in climate models, Stern x Nordhaus)
 - Irreversible decisions, risk x uncertainty (Knightian?); wait-and-see?
 - Rational expectations (using all available information) and Lucas critique
- S 1.5.2 Confidence, credibility, moral hazard and time inconsistency
 - With expectations, issues of confidence and credibility (on policy making)
 - Moral hazard (in insurance but also finance, deposit protection, bank lending)
 - Time inconsistency (ST policies not LT optimal, eg., no bail-out of banks)

S 1.5 Limits to Policy Intervention (2/3)

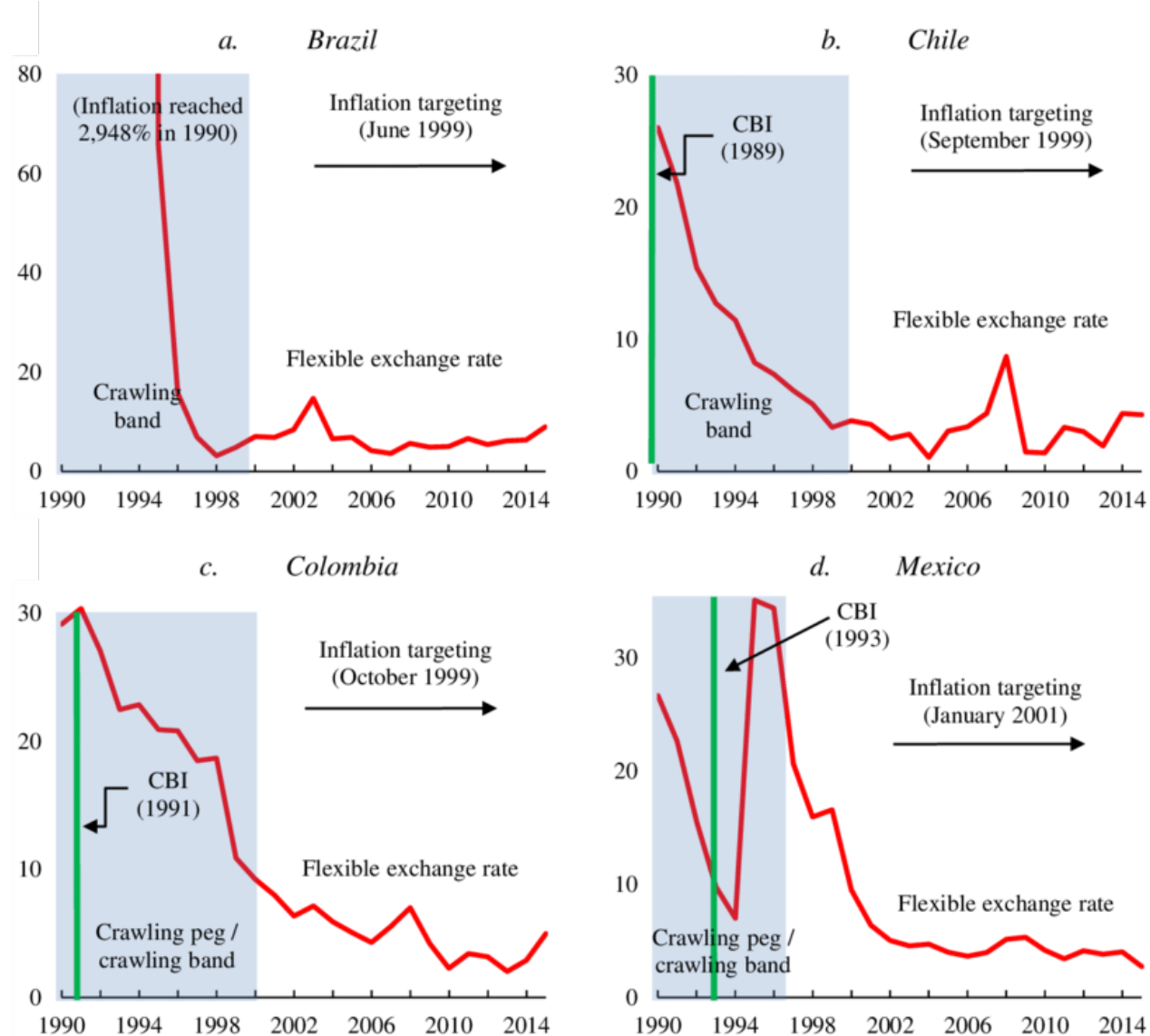
- S 1.5.3 Information, principal-agent relation, contract design
 - Information is costly and asymmetric (about true risk, etc) between principal (eg., bank manager) and agents (eg., borrower); Gosplan (central planning) has limitations; agency problems (top and bottom with different information)
 - Contract theory as response to imperfect information. Contract design to align incentives of all agents (reveal true preferences, costs)
- S 1.5.4 Political economy and behavior of policy-makers
 - Decisions can be captured by special interest groups, not the Common Good
 - “Median voter”, political cycles, power influences final policies

S 1.5 Limits to Policy Intervention (3/3)

- S.1.5.5 Delegation of policies to independent agencies
 - Limits to policy-making and complexity led to “delegation” of policy decisions to specialized, independent agencies (at both national and global level)
 - This model dominant for **central banking**, financial services, standard setting, competition, sectoral regulation (health, drugs, climate, etc)
 - Proliferation of agencies also pose problems of coordination
 - “Unelected technocrats” more immune to political pressure? Or loss of democratic control over major policy decisions?
 - Regular reporting to elected representatives mitigates “technocratic power”
 - Defined and agreed rules also help to assess / evaluate independent agencies

S.1.5.5 Delegation to independent agencies like Central Banks (more later on “inflation targeting”)

- Rules and framework for policy instruments to reach CB mandates
 - Policy rate and macroprudential interventions to reach price and financial stability
 - Exchange rate interventions to contribute to both
- Discretion and “constrained discretion”
 - Ad hoc adjustment in policy instruments or following a specific policy regime framework?
 - Communication of policy action and ex-post evaluation of interventions



The success of implementing the Inflation Targeting Frameworks with flexible ER in reducing inflation in EMEs

Source: Central banks' websites, IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions*, and IMF's *International Financial Statistics*.
 Note: CBI = central bank independence. Inflation refers to annual average CPI inflation. The shaded area covers the years that countries targeted the exchange rate to defeat inflation. Brazil did not approve legislation to grant independence to the central bank.

S 1.6 Useful “new” issues for policy

Theoretical shortcomings in Welfare Economics

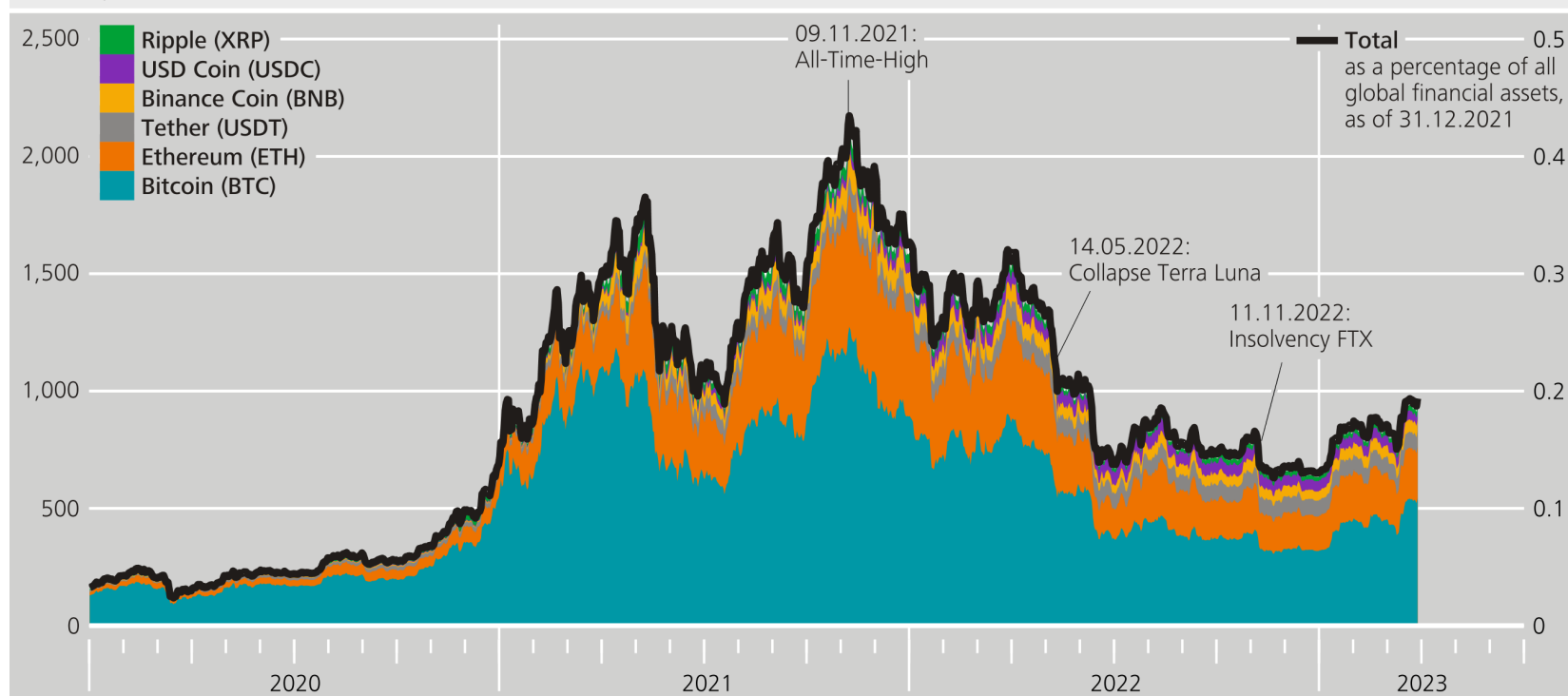
- S 1.6.1. Incomplete goods and financial markets (new “digital money”, crypto-assets) and capital (risk) markets; interdependence of economies with capital flows
- S 1.6.2 Efficient market equilibrium not automatically a Pareto optimum (inequality matters)
- S 1.6.3. Output maximization need to take into account negative externalities (climate change not priced)
- S 1.6.4 Distributive outcomes need to be analyzed and addressed otherwise problems with political economy (populism)

S 1.6.1 Digital “new money”? Significant?

- Small part of global financial assets (1-2% of total)
- But created / backed by private sector entities, not by public authorities (Governments); thus, beginning of change in confidence vis-à-vis national Governments “fiat money”?

Market capitalisation of selected crypto-assets

US-\$ bn, as of 31 December 2021



Sources: Coincodex.com and Financial Stability Board.
Deutsche Bundesbank

F3PR0391.Chart

S 1.6.2 Inequality matters for CB, different measures

- If lumpsum transfers (through fiscal - tax policy) not possible between agents, Arrow-Debreu market equilibrium is not Pareto optimum
- Socio-political pressure to change primary allocation of resources can increase
 - Wage demand; margin/mark-up rigidity can lead to inflation
 - Credit, borrowing (in excess) can lead to financial crises
- Transmission mechanism of MP can be affected

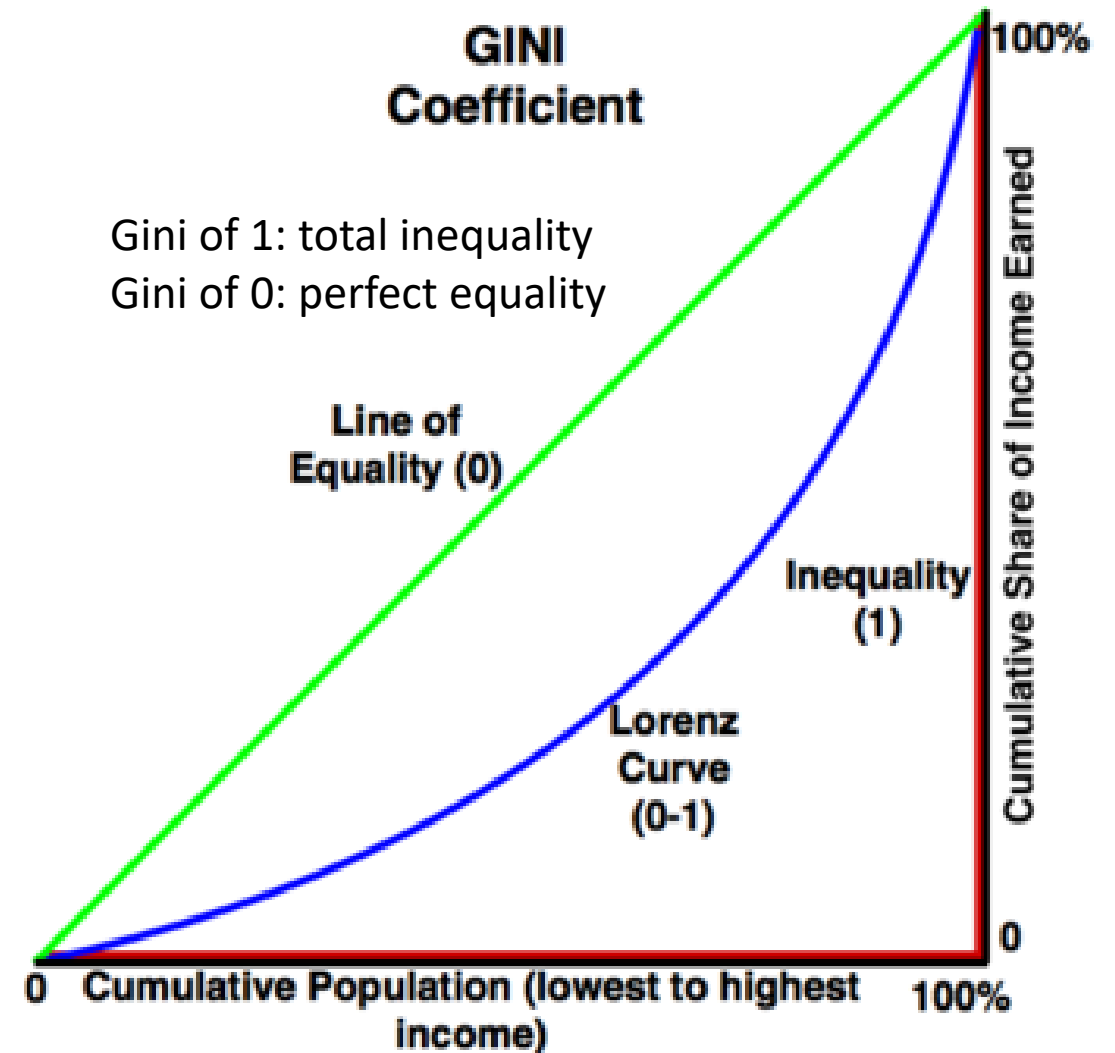
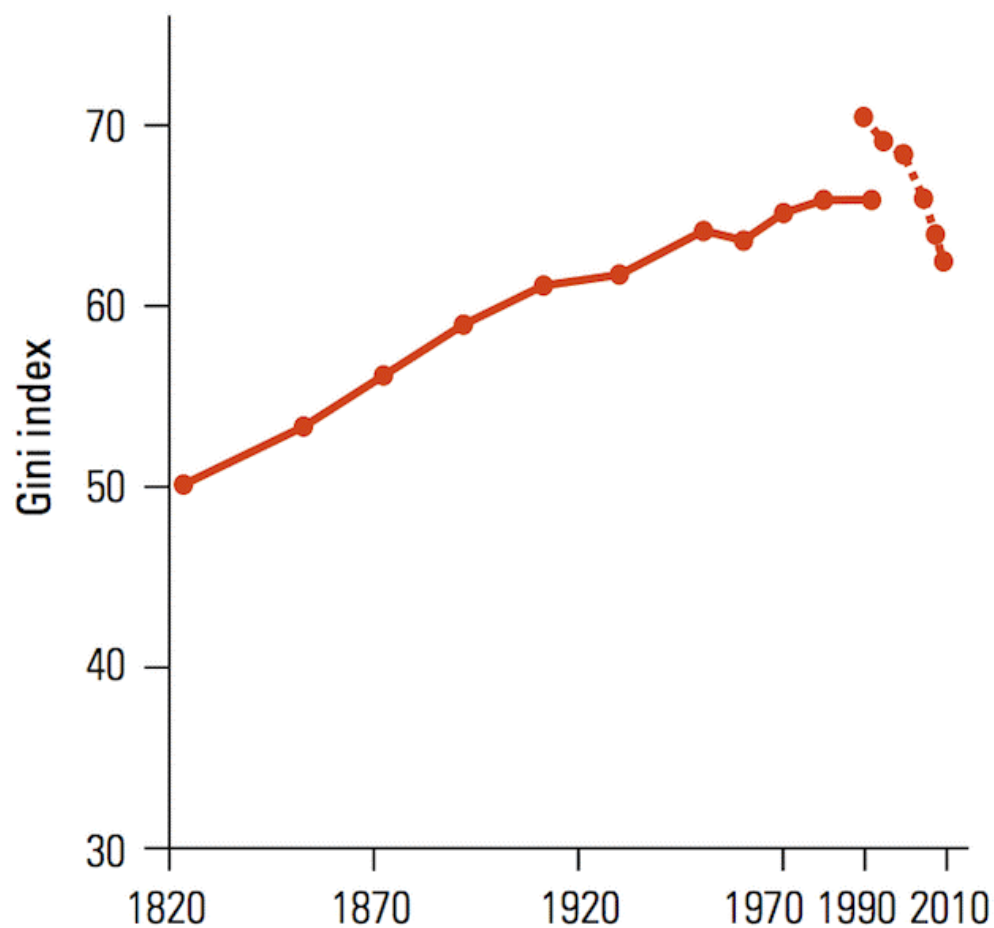
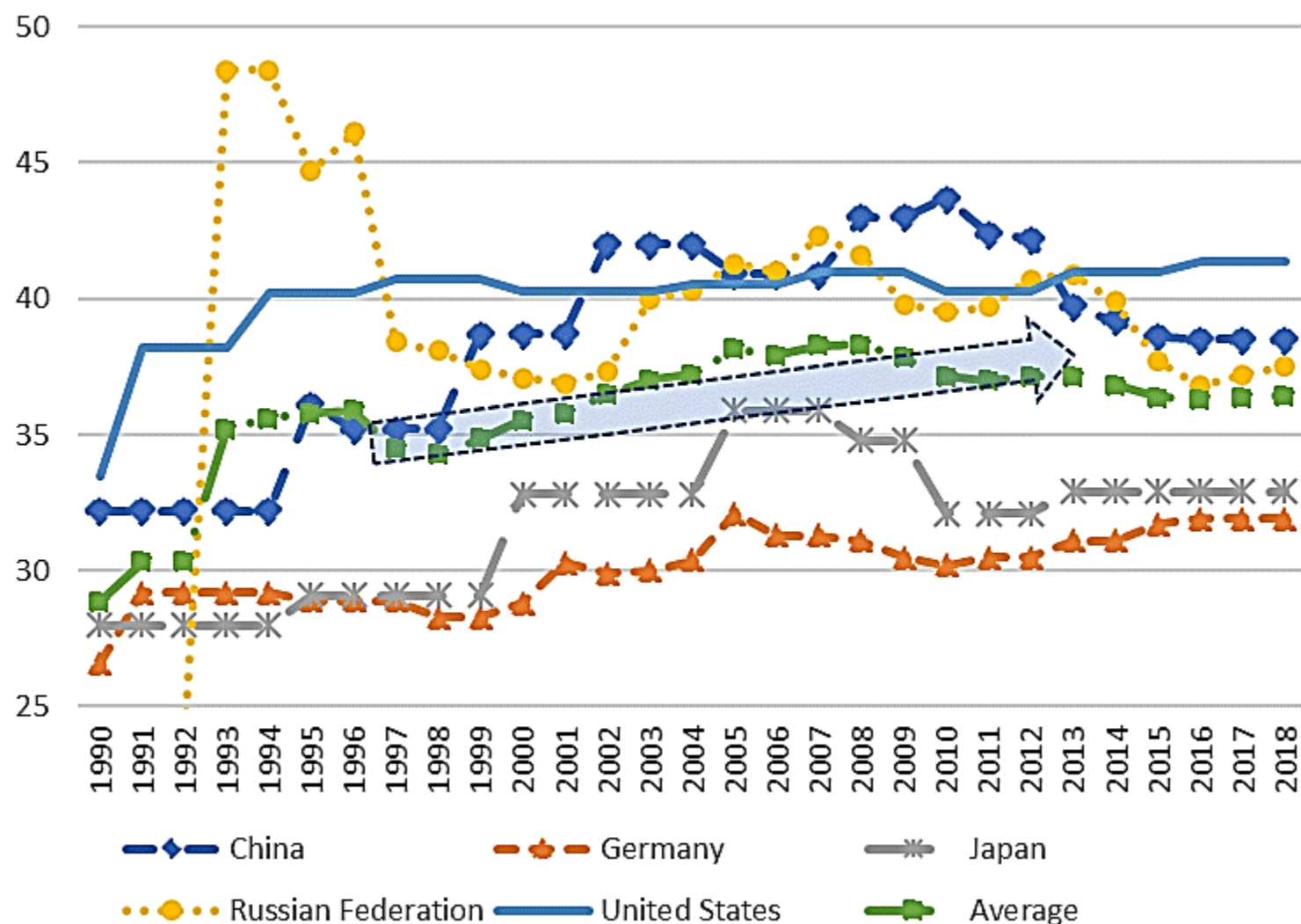


FIGURE 0.9 Global Inequality, 1820–2010

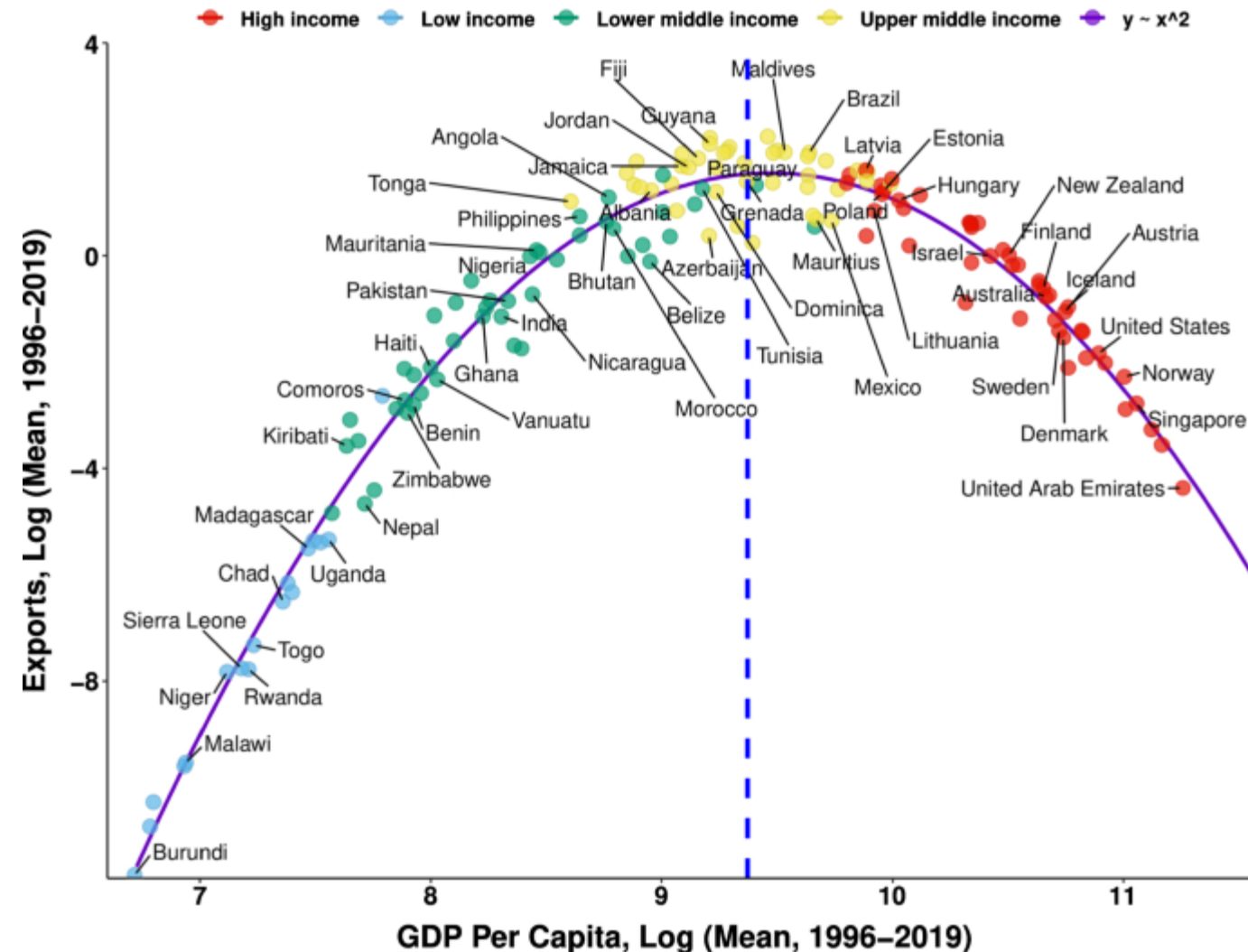


Source: Based on figure 1 (p. 27) of *The Globalization of Inequality* by Francois Bourguignon (Princeton University Press 2015). Used with permission.

Note: The discontinuity in the series represents the change in the base year of the purchasing power parity (PPP) exchange rates from 1990 to 2005. The figure uses GDP per capita in combination with distributional statistics from household surveys.

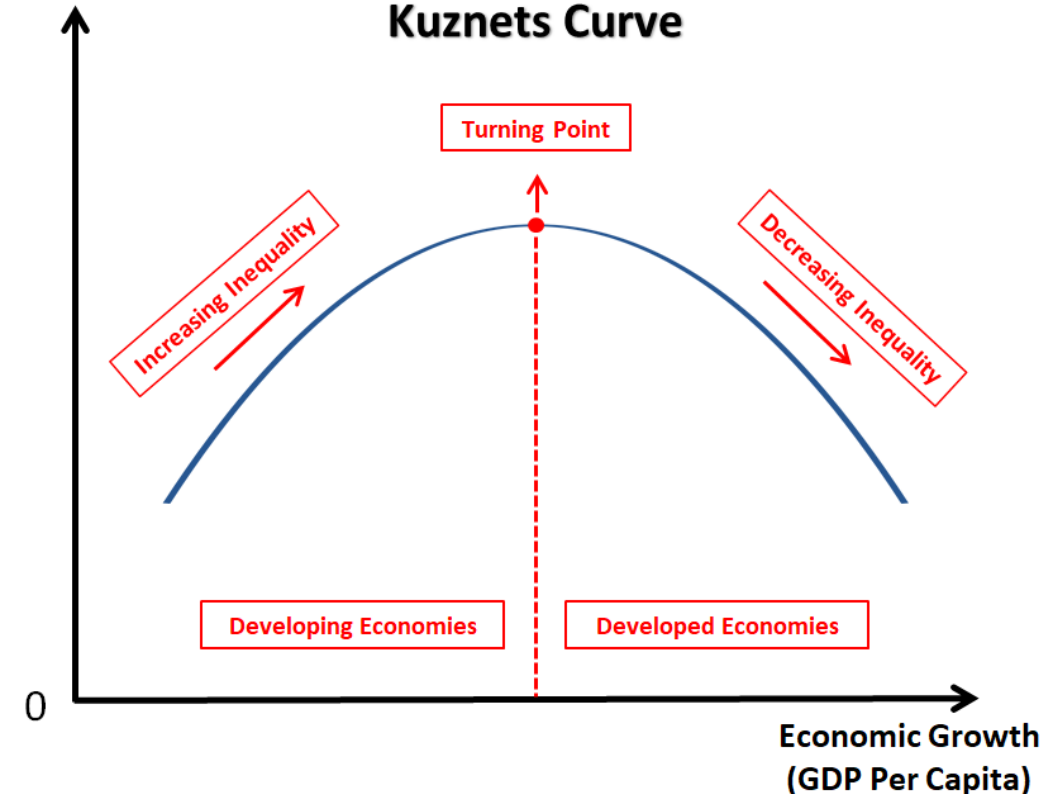


- Kuznets hypothesis is that after rising during early phases of development, inequality and Gini would progressively fall back



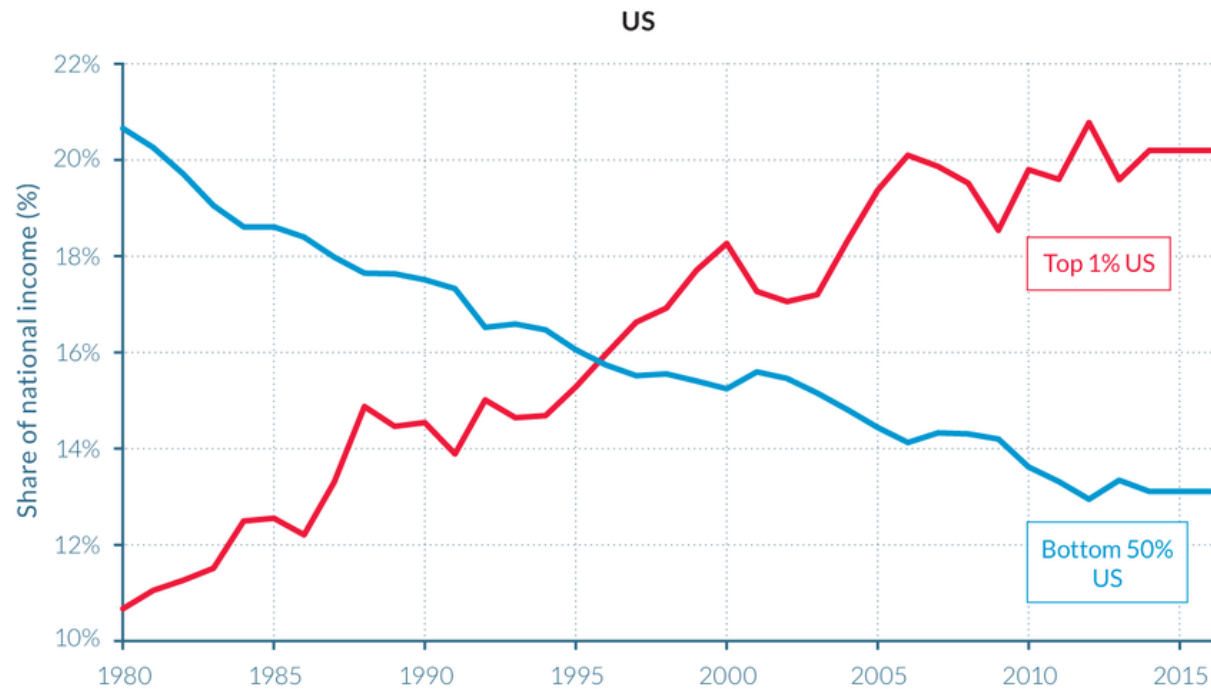
Income Inequality
(Gini Coefficient)

Kuznets Curve



www.economicsonline.co.uk

S 1.6.2 But other measures show inequality increased after 1980s

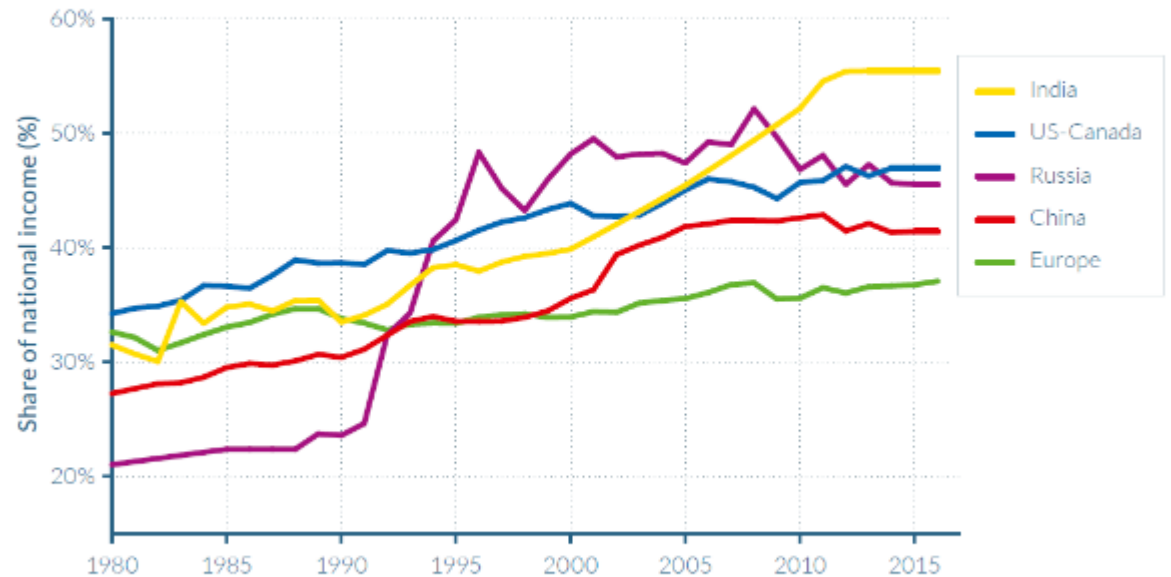


Source: WID.world (2017). See wir2018.wid.world/methodology.html for data series and notes.

In 2016, 12% of national income was received by the top 1% in Western Europe, compared to 20% in the United States. In 1980, 10% of national income was received by the top 1% in Western Europe, compared to 11% in the United States.

Figure E2a

Top 10% income shares across the world, 1980–2016: Rising inequality almost everywhere, but at different speeds

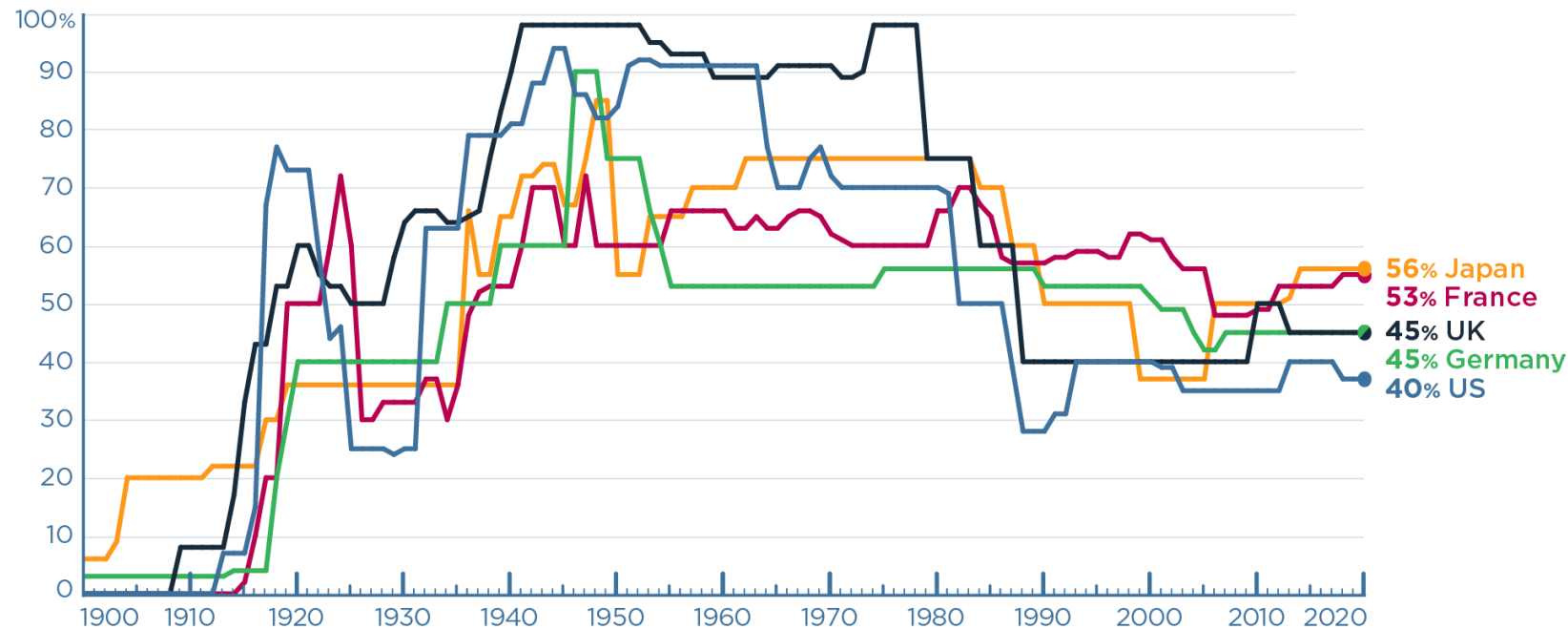


Source: WID.world (2017). See wir2018.wid.world for data series and notes.

In 2016, 47% of national income was received by the top 10% in US-Canada, compared to 34% in 1980.

S 1.6.2 Inequality affected by tax policy less progressive (more difficult for transfers)

Figure 17: Top marginal income tax rate, 1900–2020

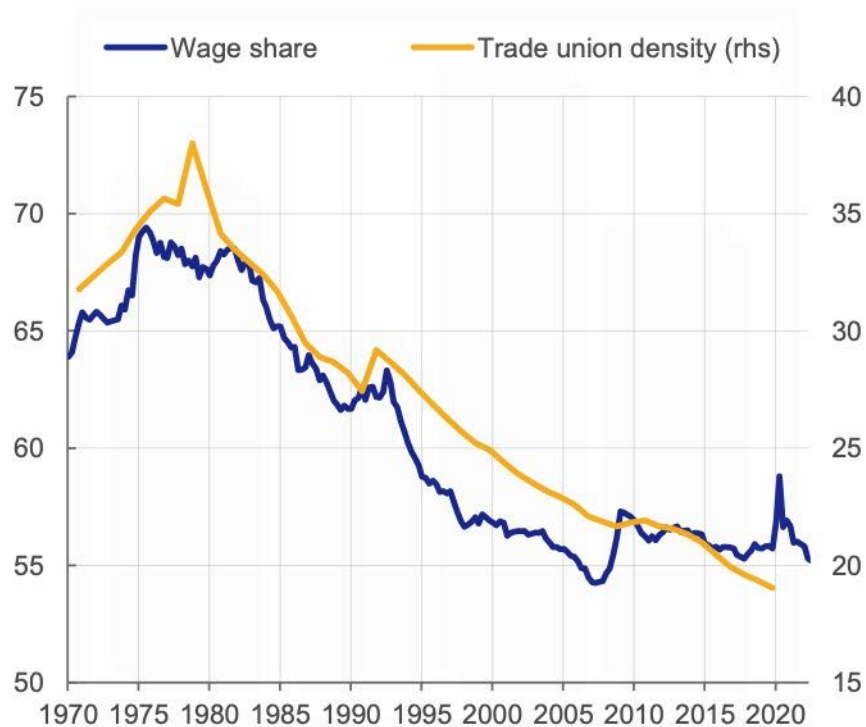


Source: Chancel (2019) based on Piketty (2014) and updates; see 2018 World Inequality Report for data; Organisation for Economic Co-operation and Development (2018-2020).

S 1.6.2.a Inequality also of wages x profits

Wage share and trade union density

(left-hand side: share of GDP, percentage; right-hand side: share of employment, percentage)



Source: Eurostat, Area-Wide model, OECD, and ECB calculations.
Note: The trade union density for the euro area is a GDP-weighted average of data for Austria, Belgium, France, Germany, Italy, the Netherlands, Portugal and Spain.
Latest observation: 2022Q2 for wage share; 2019 for trade union density.

Profit share

(share of GDP, percentage)

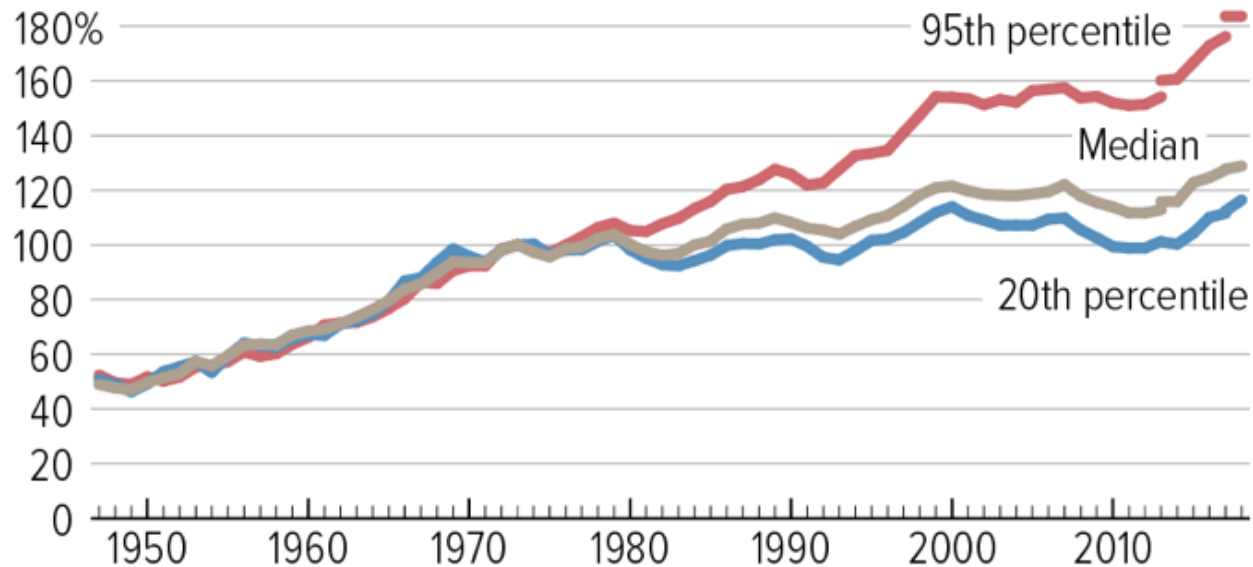


Source: Eurostat, Area-Wide model, and ECB calculations.
Latest observation: 2022Q2.

S 1.6.2.b Inequality of median income

Income Gains Widely Shared in Early Postwar Decades — But Not Since Then

Real family income between 1947 and 2018, as a percentage of 1973 level

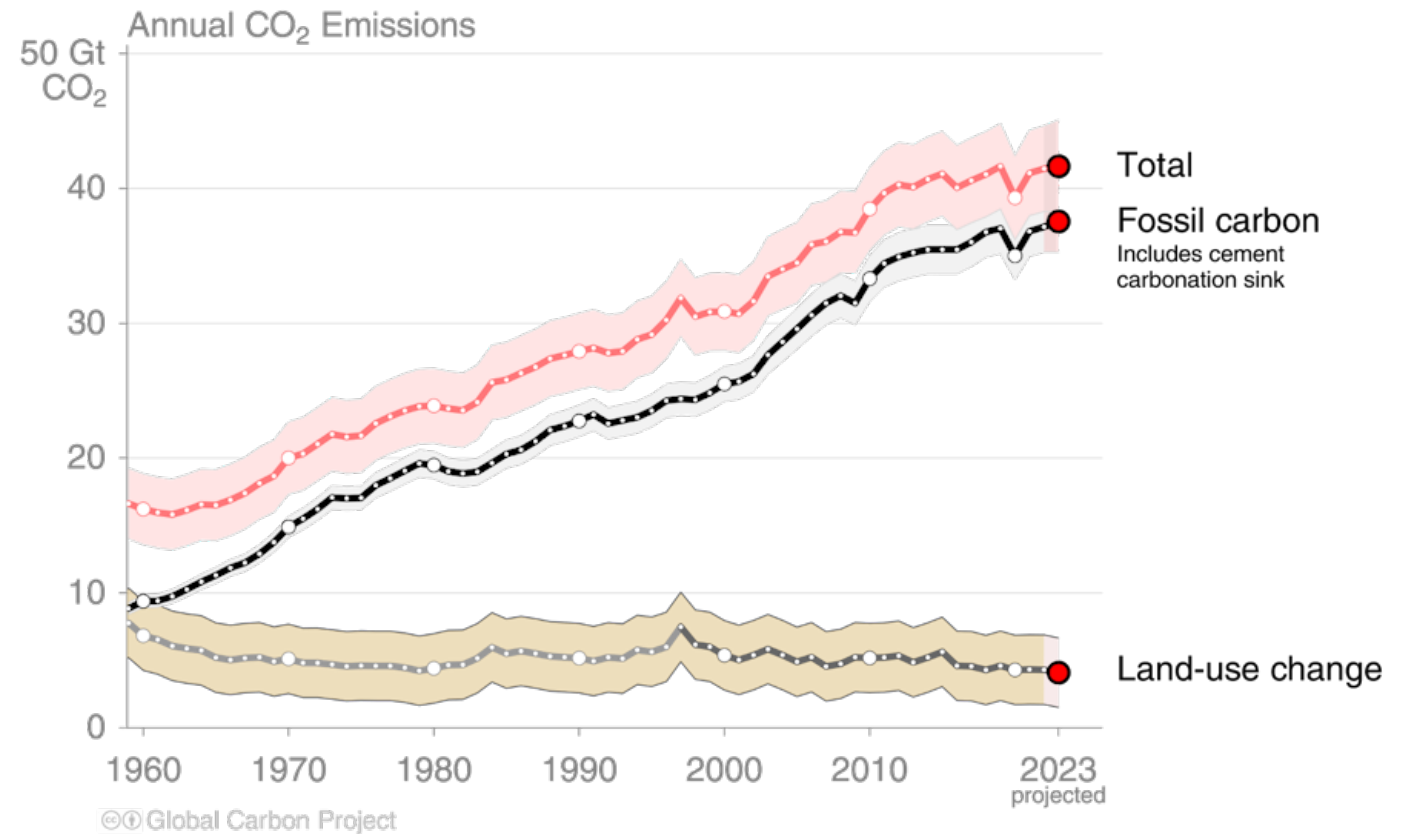


Note: Breaks indicate implementation of a redesigned questionnaire (2013) and an updated data processing system (2017).

Source: CBPP calculations based on U.S. Census Bureau Data

S 1.6.3. Negative externalities (climate change) matters for CBs and not “priced”: GHG emissions rising

- Global warming man made, GHG rising, affects CB mandates with extreme weather events:
- On inflation: food prices, yields, production costs of goods and services
- On financial stability: insurance losses, re-valuation of assets



S 1.6.4 Distributive outcomes can bring problems with political economy (populism)

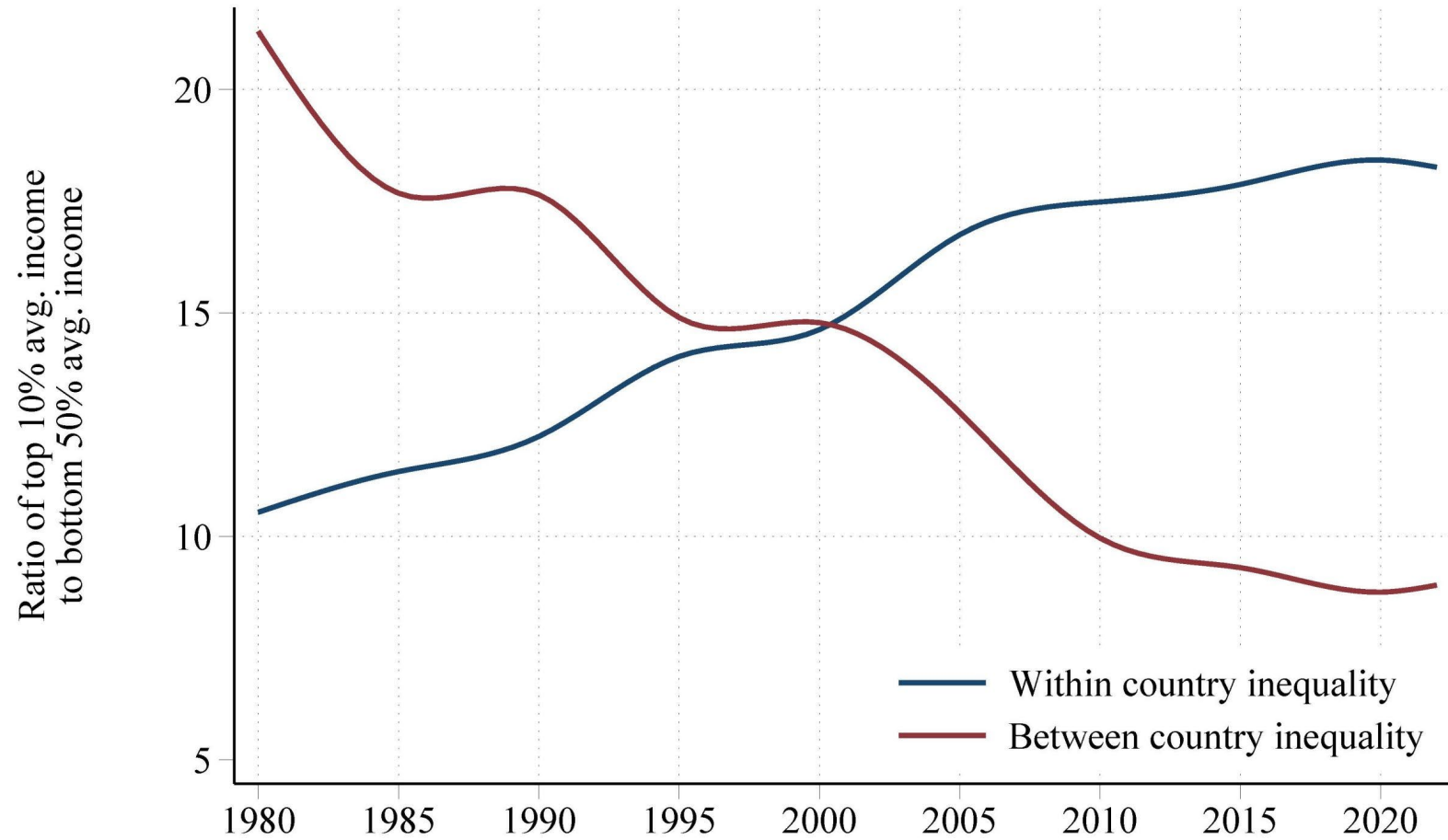
- Technological change, globalization, industrial and financial integration had large positive effects across countries (reduction of income difference between AEs and EMEs)
- But within many countries (i.e. US, EU), job transfers affected specific geographical areas and specific groups (e.g., low skilled workers, lower middle-class) and led to “pockets of discontent”
- These areas can be associated with leaning toward “populist vote”
- Populism brings more volatility to the macroeconomy, less predictable economic policies, less stable international relations; affects mandates of independent agencies

Debate of the 1930s about populism in Europe

- Aftermath of the Great Recession; crises of many European liberal democracies; rise of extreme-right populism
- Debate about whether causes were too much intervention of the State in economic affairs or too little intervention to protect basic public rights (Social Welfare State)
- Hayek x Keynes-Beveridge

Global income inequality, 1980-2022

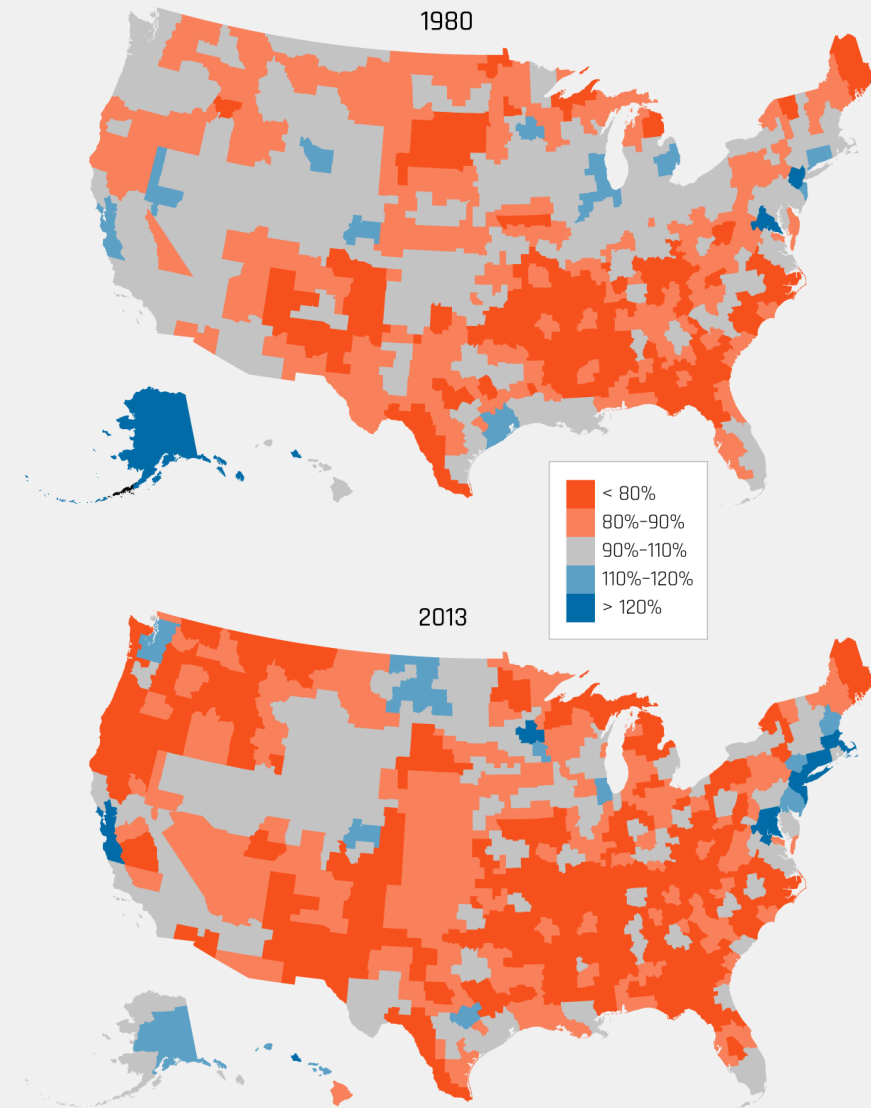
Between vs. within country inequality



Source: World Inequality Database

Economic disparities across regions have grown over the past 40 years

Commuting Zone mean family income as a percentage of the national average, 1980 and 2013

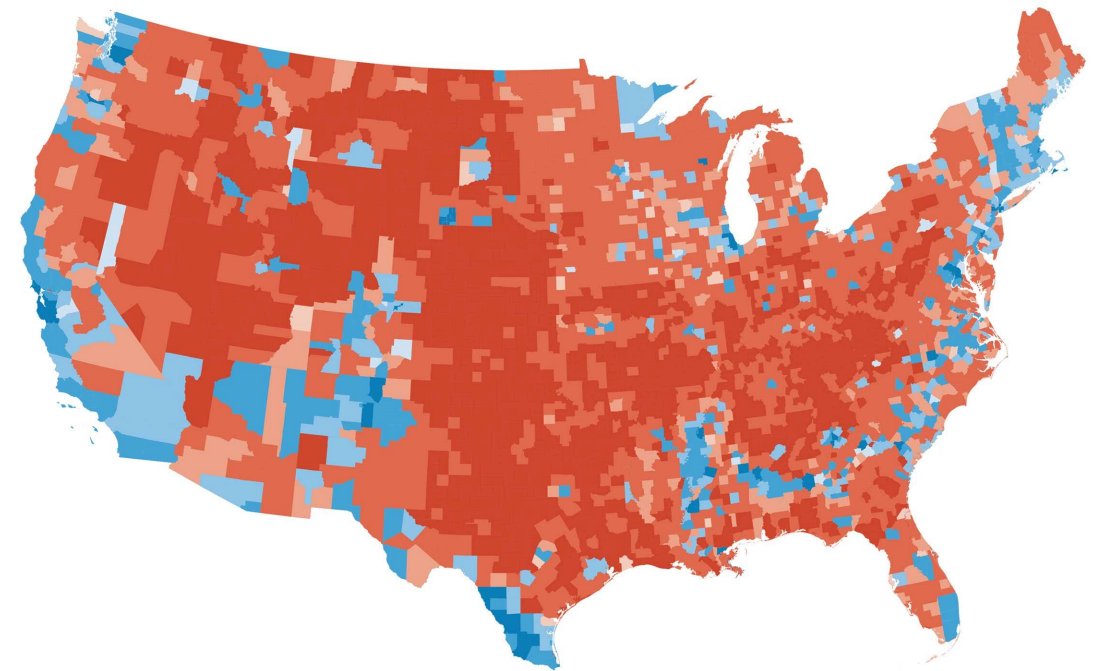


Source: 1980 Decennial Census and 2011–2015 American Community Survey 5-year estimates, compiled by IPUMS USA
<https://usa.ipums.org/usa/>.

2016 presidential election results by county

Data from U.S. Election Atlas.

Clinton +50-100 +15-50 +2.1-15 +0-2.1 Trump +0-2.1 +2.1-15 +15-50 +50-100



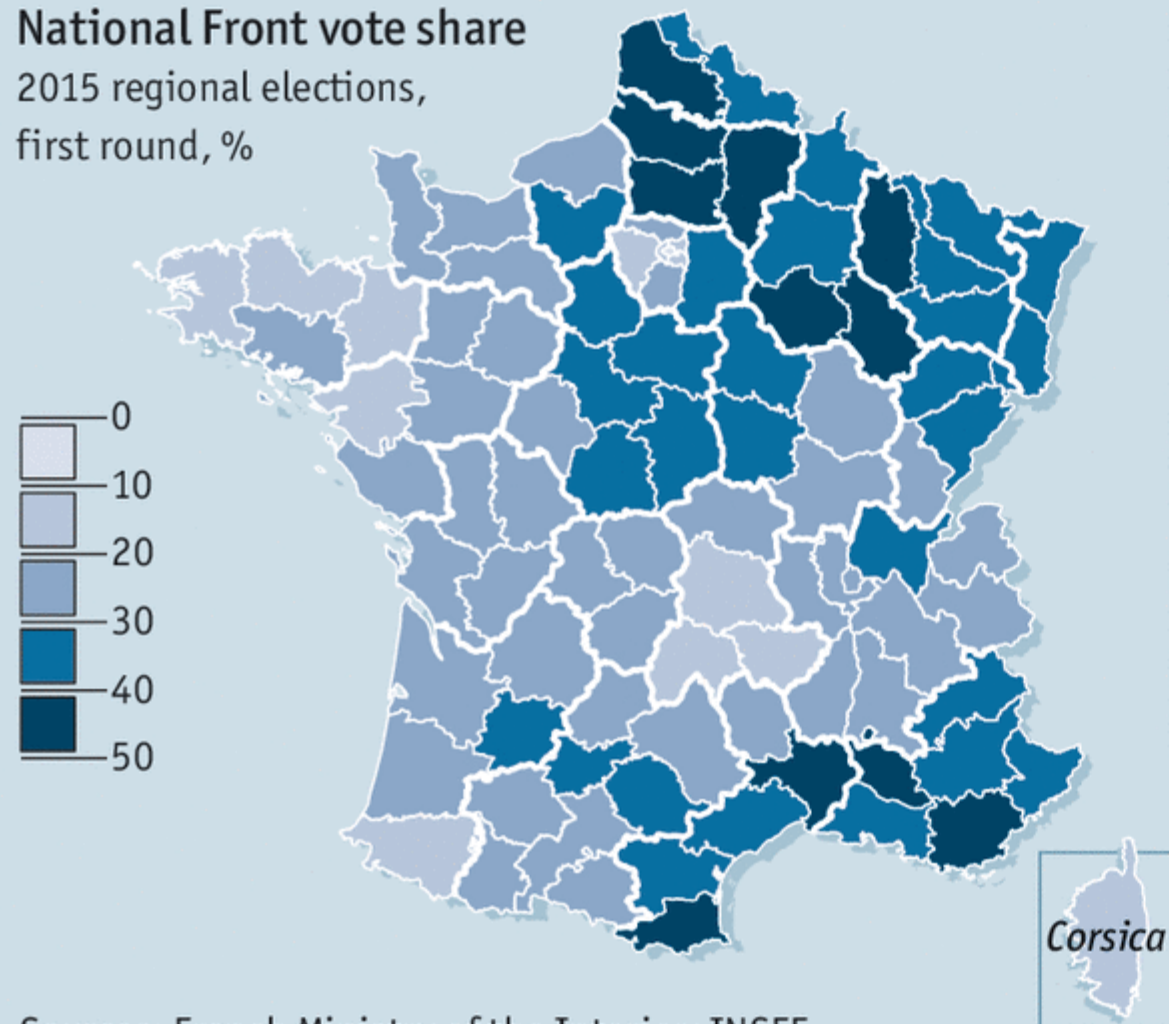
Source: The Washington Post

Where the jobs aren't

France, by department

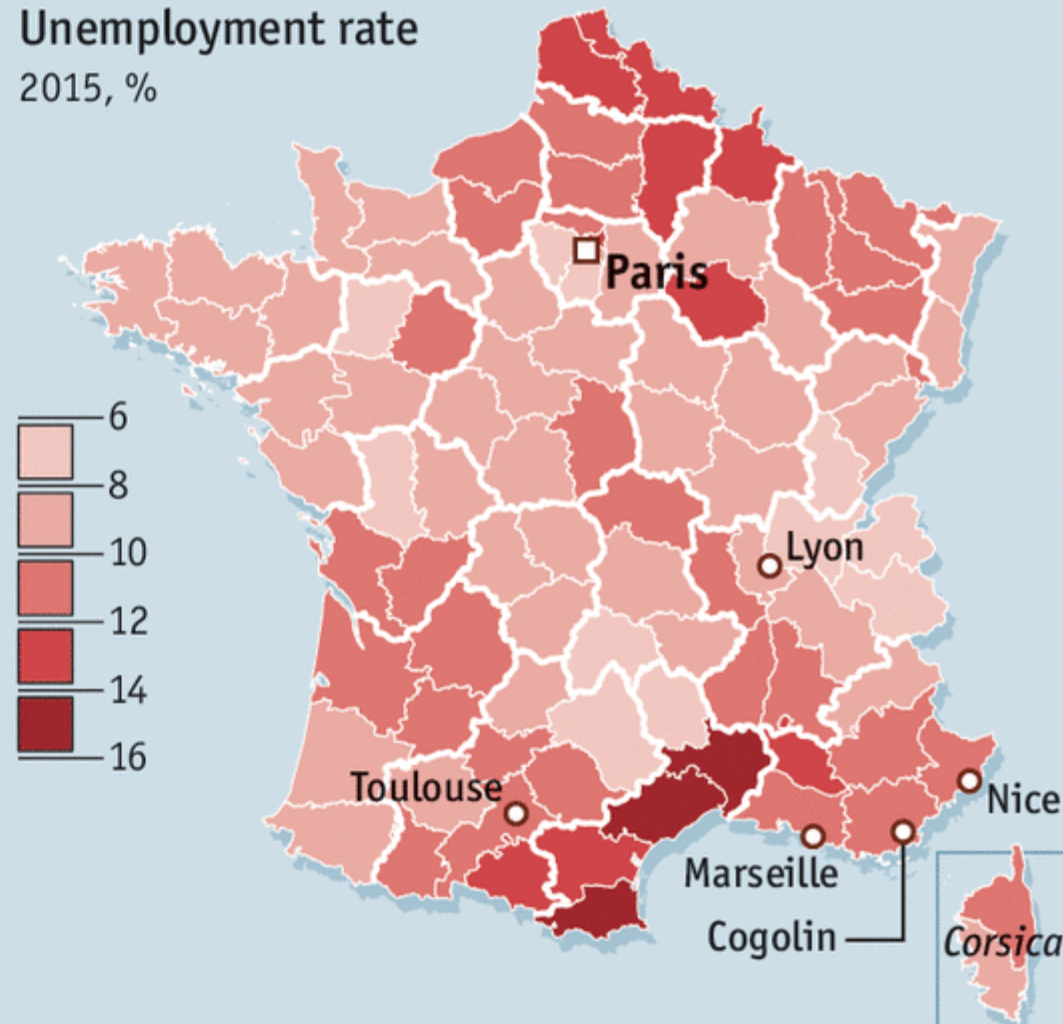
National Front vote share

2015 regional elections,
first round, %



Unemployment rate

2015, %



Sources: French Ministry of the Interior; INSEE

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Box S1.1: AS-AD Model

- Simple way to represent aggregate equilibria; a bit outdated (CB now target inflation, not M); principle similar DSGE without microfoundations
- Consumption (C) = $f(\text{output } Y, [\text{wealth/price level } P])$
- Output (Y) = $f(\text{employed labor } N)$; potential output $Y^* = f(\text{total labor } L)$
- Wage level $W = f(\text{price level } P \text{ at } t \text{ and } t-1, \text{unemployment } [N/L])$
- ST, W rigidity (contracts rigid); P rise, real W falls; LT W depends on $[N/L]$
 - Employed labor $N = f(\text{price level } P \text{ at } t \text{ and } t-1, \text{production } Y)$
- LT, Price level same, $N=L$, $Y=Y^*$; supply is vertical

Box S1.2: IS-LM Model

- Formalization of Keynes General Theory
- IS curve: product market equilibrium; LM curve: money market equilibrium; both curves for a given product price
- IS: combination of output Y and interest rate i ; downward slope, higher i lower demand for product
- LM: given M , combination of output Y and interest rate i giving money market equilibrium; with fixed M , upward slope, demand for money (transaction) increases with output Y