



Institutions, Trade & Economic Growth

Summer 2025

King's Summer School

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Day 4 – The government and the economy



1. Economic growth
2. Coordination problems and institutions (1/2)
3. Coordination problems and institutions (2/2)
4. The government and the economy
5. Money and financial markets
6. Institutions as fundamental causes of growth
7. Geography, culture and institutions
8. Trade gravity and lost cities
9. The Atlantic trade and economic growth
10. Trade policy in developing countries.

We are here

*Daniele
Girardi*

*Pierre-Louis
Vezina*

Government intervention in the economy

Two main forms of *direct* government intervention in the economy:

- Macroeconomic policy
- Industrial policy

Macroeconomic policy

- *Macroeconomic policy:*
Government actions aimed at achieving specific goals for the economy as a whole – stability, low inflation, economic growth
- Government budget → *fiscal policy*
- Central Bank's interest rate → *monetary policy*
- Both existed for centuries in many countries but are used for managing the economy only since around the 1940s.

Industrial policy

- *Industrial policy:*

Government policies that explicitly aim to transform the *structure* of the economy by targeting specific industries, firms, or economic activities.

- Economic growth is usually the ultimate goal, but recently also environmental ('green') and regional ('place-based') objectives.
- More targeted than macroeconomic policy, and longer-term goals.
- Often overlaps with fiscal policy: taxes and subsidies are key instruments of industrial policy.

Plan for today

1. Fiscal policy & the government budget.
2. The effects of fiscal policy on the economy.
3. Public debt.
4. Fiscal policy & long-run growth
5. Industrial policy

Fiscal policy

- Influences the economy through government spending & taxation.
- Government fiscal balance

$$BB = \text{Revenues} - \text{Expenditure}$$

$$BB = \text{Tax revenues (T)} - \text{Non-interest spending (G)} - \text{Interest spending (INT)}$$

- $BB < 0 \rightarrow$ budget *deficit*.
- $BB > 0 \rightarrow$ budget *surplus*

Primary fiscal balance (T – G)

Example: Budgets in the UK

- Government needs parliament's authorization to spend money or change tax rates.
- Once or twice a year, gov't lays out its budget plans for next fiscal year.
 - Planned expenditure & its allocation across departments.
 - Any changes to tax laws & overall expected revenues.
 - Usually also discusses the state of the economy & its economic strategy.
- Parliament then votes on this plan, in the form of a *finance bill*.



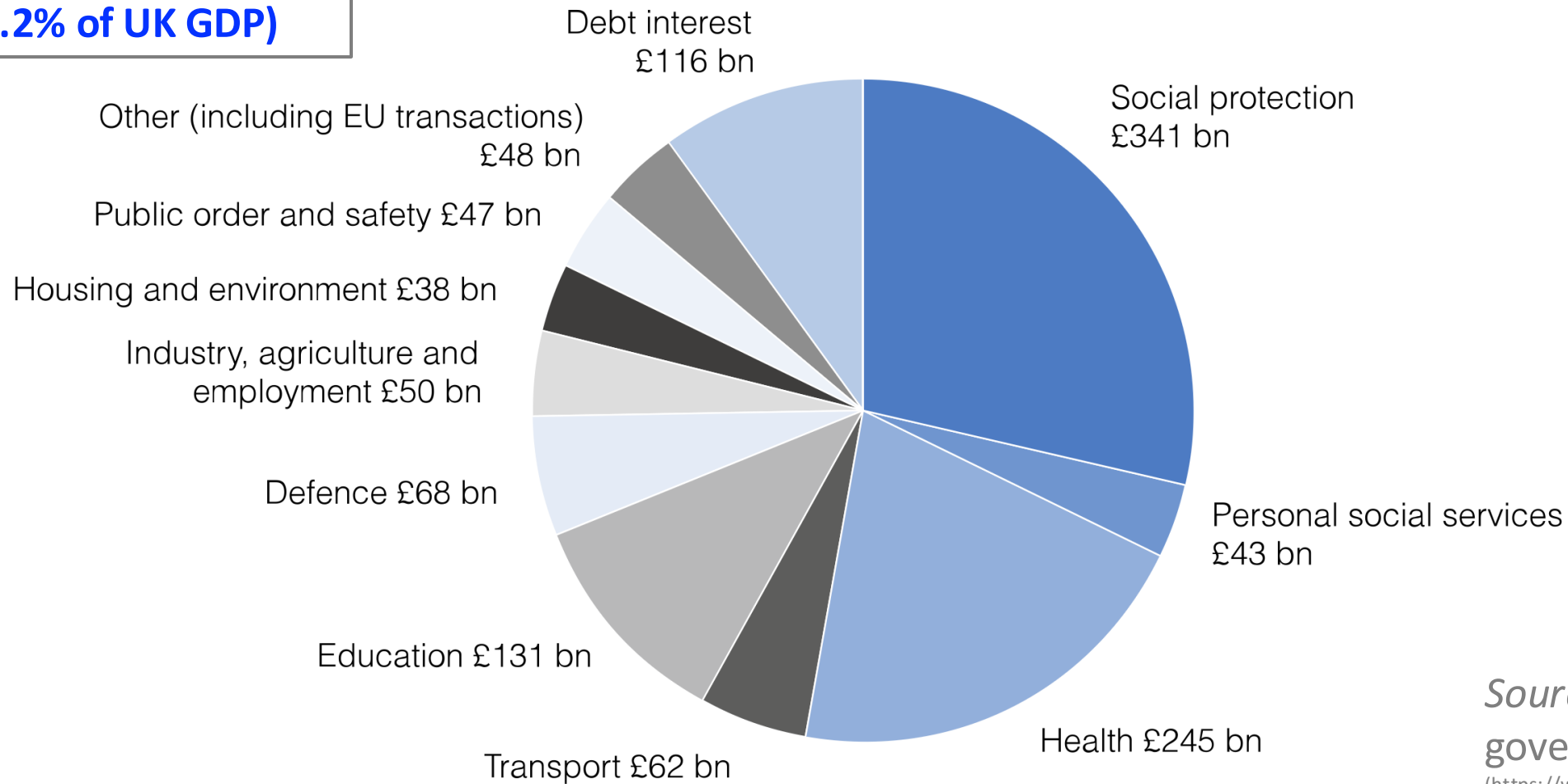
Government expenditure

- Today, main items are
 - Social security
 - Health
 - Education
 - Military
- Useful distinctions:
 - Interest spending **vs.** non-interest spending.
 - Spending on goods & services **vs.** Transfers.
 - Current spending **vs.** Investment.



Example: UK government spending (2023-24)

Total spending:
£1,189 bn
(44.2% of UK GDP)



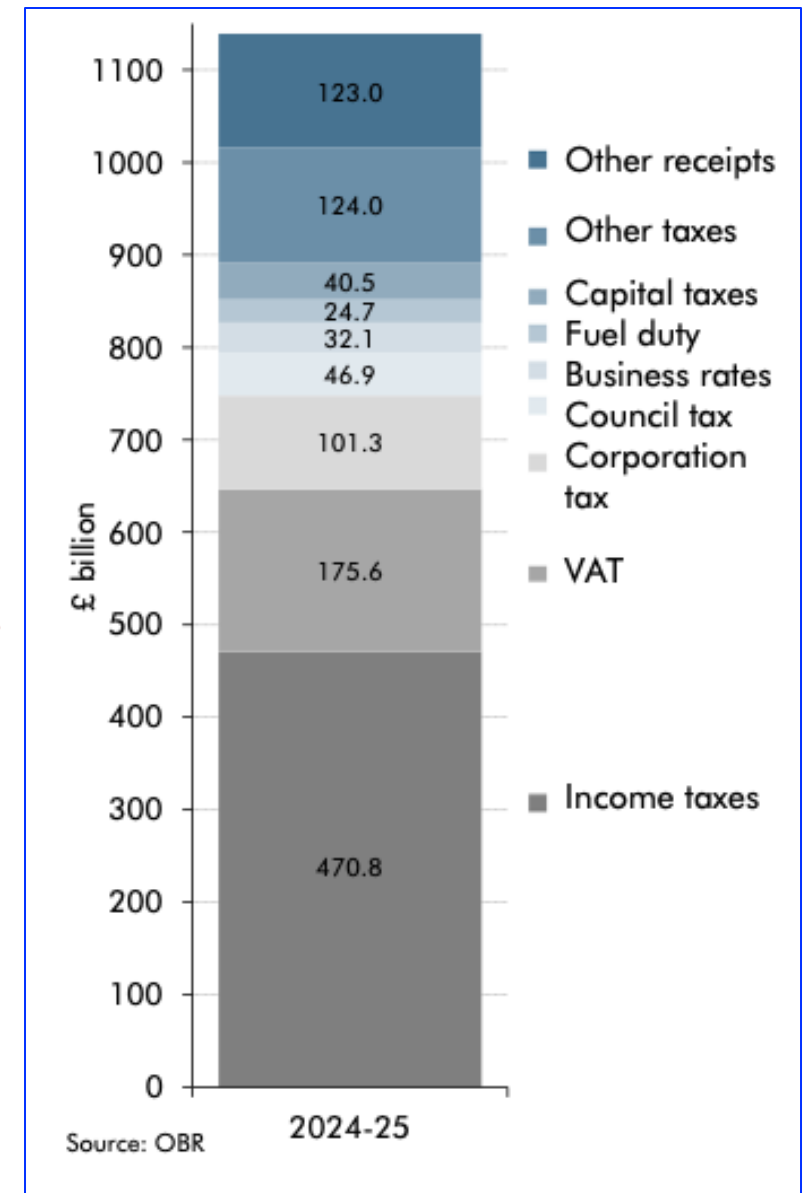
Source: UK
government

(<https://www.gov.uk/government/publications/spring-budget-2023/spring-budget-2023-html>)

Taxation

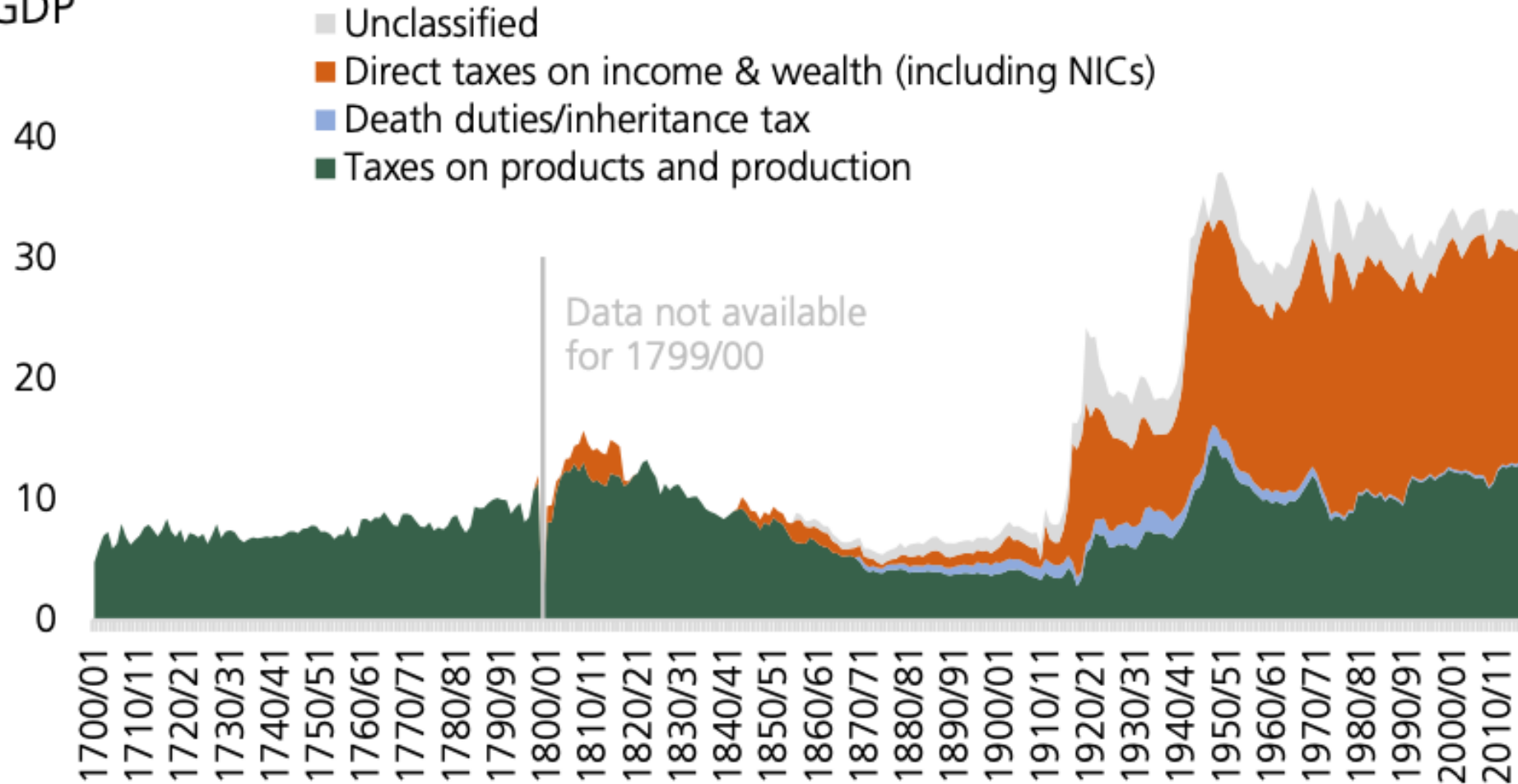
- Income taxes on people
 - Corporate taxes
 - Wealth/inheritance taxes
 - Sales taxes (VAT, excise duties...)
 - Progressive if the tax *rate* increases with income/wealth.
- Direct taxes
- Indirect taxes

Example: Sources of tax revenues in UK



Composition of public income, UK, 1700/01 - 2015/16

% GDP



Source: Bank of England, *A millennium of macroeconomic data, V3.1*, 2 March 2017

The economy affects the budget

- Some changes in G & T are *discretionary*.
 - But G & T also fluctuate in response to economic conditions.
 - The higher economic activity, the higher T.
 - Some components of G called *automatic stabilizers* are higher when GDP is lower.
 - unemployment benefits, income support payments...
- *Other things equal, the deficit increases in recession and decreases under strong economic growth.*

Composition of the economy's output

$$GDP = C + I + G + X - IM$$

Gross Domestic
Product

(market value of all goods & services produced in the country during the year)

Private
Consumption

Private
Investment
(housing +
business)

Gov't
spending
(excluding
interest and
transfers)

Exports

Imports

The budget affects the economy

- Composition of the economy's output:

$$GDP = C + I + G + X - IM$$

- G directly affects GDP
- G & T both have indirect effects through C, I, X and IM
 - Higher G increases people's and firms' incomes, potentially raising C & I.
 - But in some cases, it might also displace resources from C & I.
 - Higher T reduces income available for C & I.
 - More overall spending also increases imports (IM)
 - Through effects on exchange rates, can affect IM and X also in other complicated ways.

Effects of fiscal policy

- An increase in G generally boosts GDP & reduces unemployment.
- An increase in T generally lowers GDP & increases unemployment.
- **Fiscal contraction** (or consolidation) = decrease in deficit $G - T$.
- **Fiscal expansion** = increase in deficit $G - T$.
- Fiscal expansion boosts the economy.
- But might also create inflation, produce a trade deficit (= imports outpace exports), and increase public debt.

Fiscal multipliers

- *Spending multiplier*: how much GDP increases if G increases by 1£.
- *Tax multiplier*: how much GDP decreases if T increases by 1£.
- Multipliers are higher when the economy is working below capacity & unemployment is high.
 - Fiscal expansion is most powerful (& contraction most harmful) when the economy is depressed.
 - Policymakers should let the deficit increase in bad times, reduce it in good times.

Public debt

- Deficits are financed by borrowing → Public debt.
 - Deficit (or surplus) = *flow*.
 - Debt = *stock*.
- Unlike a household, gov't does not need to repay its debt.
- What matters is not debt in £, but *debt-to-GDP ratio*.
 - Debt sustainable if Debt/GDP stable (or decreasing) over time.

The dynamics of public debt

- Budget deficit \rightarrow increase in public debt in £.
- But debt-to-GDP ratio depends also on other variables.
- Factors affecting the evolution of debt/GDP over time:
 - Primary deficit $G - T$
 - Interest rate i
 - Economic growth g
 - Inflation π

The dynamics of public debt

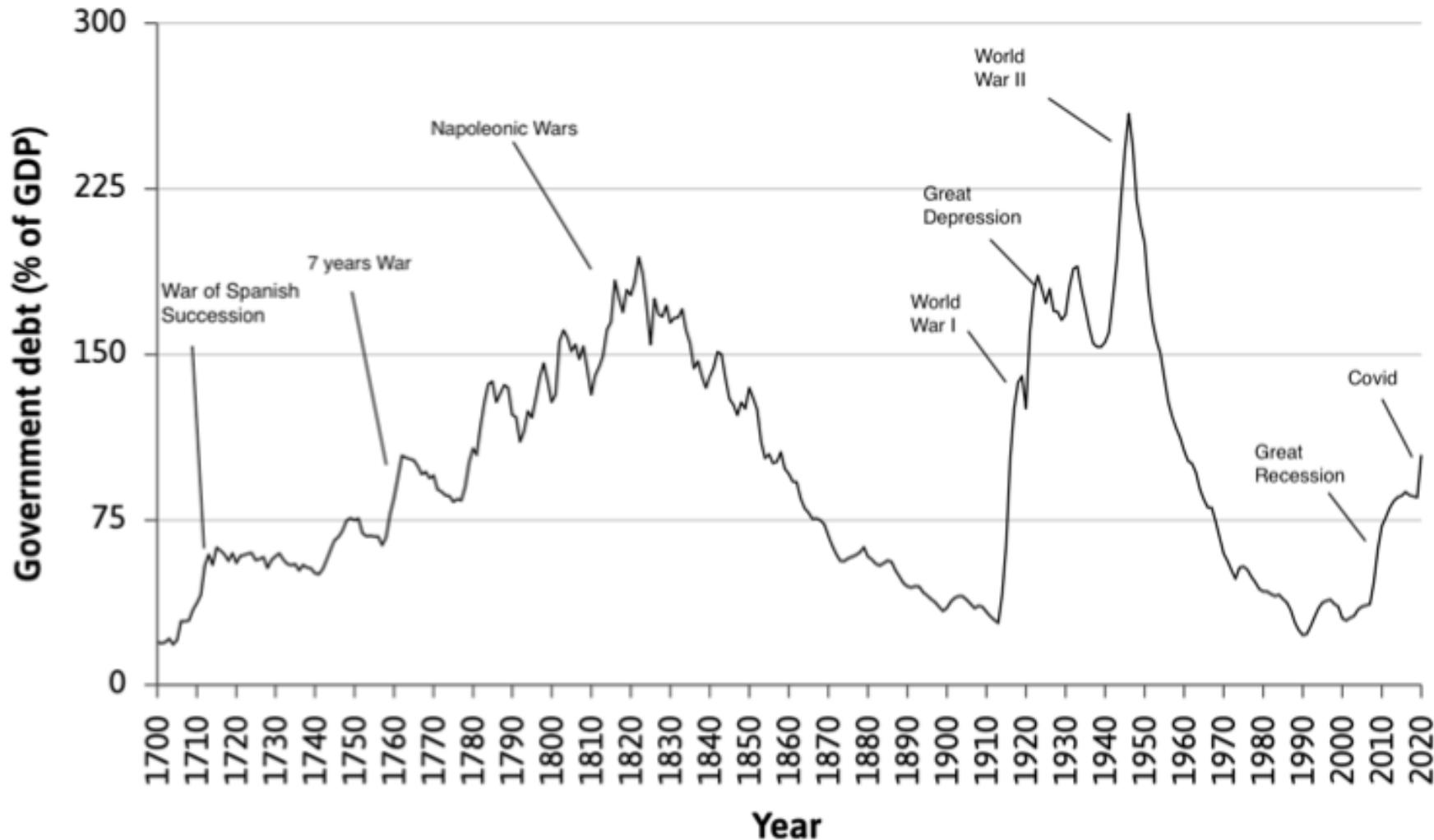
$$\frac{Debt_t}{GDP_t} - \frac{Debt_{t-1}}{GDP_{t-1}} = (i - g - \pi) \frac{Debt_{t-1}}{GDP_{t-1}} + \frac{G_t - T_t}{GDP_t}$$

The diagram illustrates the equation for the dynamics of public debt. Arrows point from specific terms in the equation to their economic interpretations:

- $\frac{Debt_t}{GDP_t} - \frac{Debt_{t-1}}{GDP_{t-1}}$ (blue) points to "Change in debt-to-GDP over time" (blue).
- i (green) points to "(Nominal) Interest rate" (green).
- g (green) points to "Real growth rate" (green).
- π (green) points to "Inflation rate" (green).
- $\frac{Debt_{t-1}}{GDP_{t-1}}$ (black) points to "Debt/GDP in previous year" (black).
- $\frac{G_t - T_t}{GDP_t}$ (purple) points to "Primary deficit/GDP" (purple).

- > Debt/GDP increases during recessions, tends to fall with sustained growth.
- > When $g + \pi > i$, Debt/GDP can decrease (or remain stable) even with a deficit!

UK Government debt (% GDP), 1700-2020



- Debt/GDP increases during wars, epidemics & recessions.
- Today's level (~100%) high but not unprecedented.
- Recent rise triggered by 2008 financial crises, deepened by 2020 Covid crisis.

Fiscal and industrial policy & long-run growth

- We usually think of fiscal policy mainly as a way to manage short-run fluctuations in economic activity.
- However, fiscal policy has also important effects on long-run growth:
 1. Fiscal policy can avoid economic crises & depressions with permanent effects on production potential.
 2. Government investment (in health, education, infrastructures, ...) can increase productive capacity in the long-run through productivity effects on capital & labor.
 3. Fiscal measures are (directly & indirectly) an important determinant of R&D investment, that can drive innovation (→ Industrial Policy).

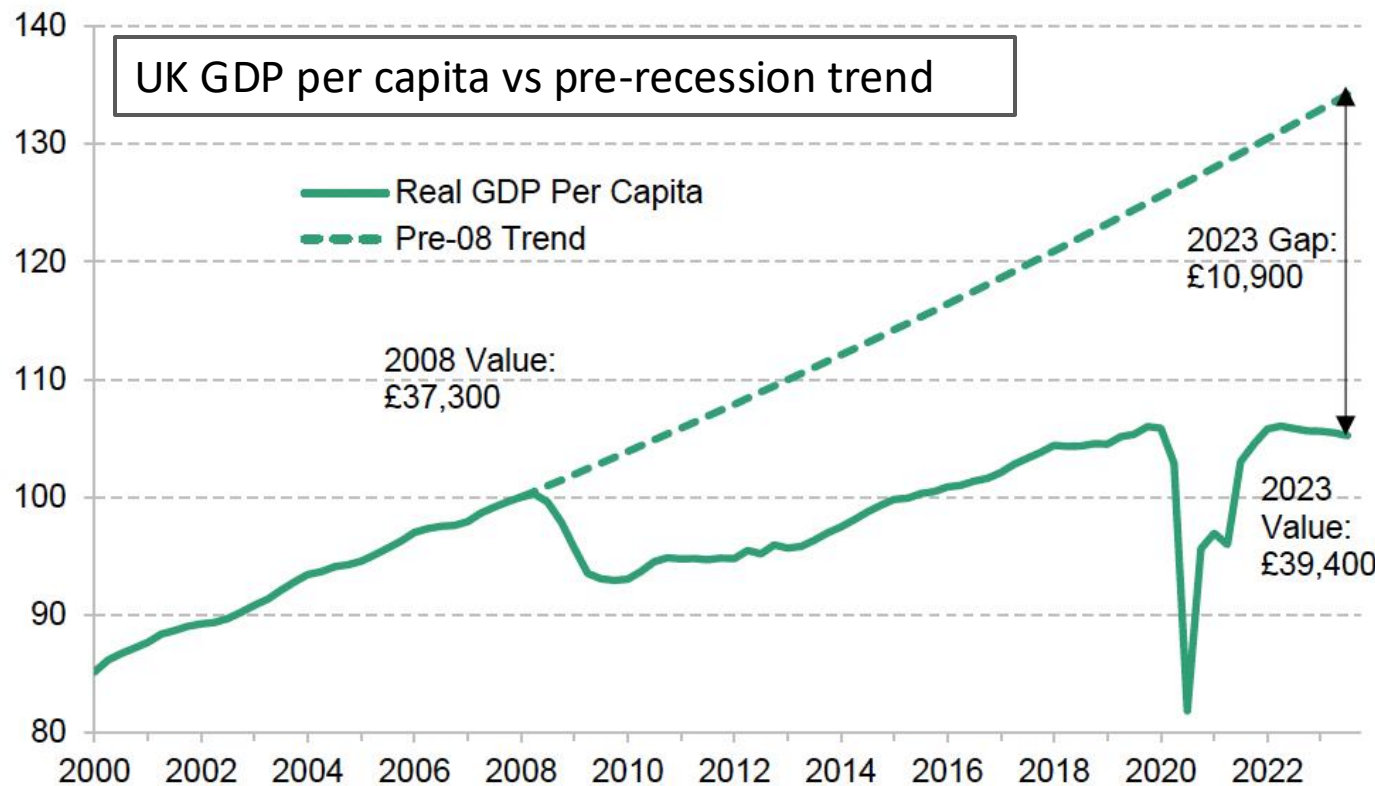
Long-run effects of fiscal demand management

1. Fiscal policy can avoid economic crises & depressions with permanent effects on production potential.
 - Left on their own, capitalist market economies can get stuck in a low production, low employment, low growth equilibrium that permanently restricts an economy's growth path.
 - In a depressed economy, families can't increase consumption, and firms have no incentive to invest: a self-sustaining low-growth equilibrium.
 - An 'external' injection of demand from government is needed to break this 'depression' equilibrium and restore growth.

Example: the 2008-09 Global Financial Crisis

2008 financial crisis, originated in US mortgage loans sector, quickly spread globally.

Financial losses → drop in spending → recession.



Source: Institute for Fiscal Studies (June 2024)

- UK one of the hardest hit countries.
- After initial (moderate) stimulus, UK switched too early to fiscal consolidation.
- → Recovery slow & incomplete.
- GDP remains far below pre-recession trend.
- → Permanent effect of fiscal policy choices on GDP path.
- True also in other rich countries (especially Europe).

Government investment & long-run growth

2. Government investment (health, education, infrastructures, ...) can increase productive capacity in the long-run through productivity effects on capital & labor.
- Investment in health and education increase labor productivity.
 - Investment in public infrastructure (railways, airports, communication networks,...) increase the productivity of private firms.



The government's role in innovation

3. Fiscal measures are (directly & indirectly) an important determinant of R&D investment, that can drive innovation.
- Involves a different type of investment: **Research & Development (R&D)**.
 - *“Creative and systematic work undertaken in order to increase the stock of knowledge and to devise new applications of available knowledge ”* (OECD definition)
 - Basic research: *experimental/theoretical work to acquire new knowledge of the underlying foundations of phenomena & observable facts, without a specific application or use in view.*
 - Applied research: *original investigation undertaken to acquire new knowledge (..) directed primarily towards a specific, practical aim or objective.*
 - Experimental development: *systematic work, drawing on basic & applied research, directed to producing new products or processes or to improving existing products or processes.*

The government's role in innovation

- Why is R&D important? Why does it need government support?
- Technological progress is necessary for long-run growth.
- However, technical knowledge is typically a *public good*.
 - non-rival & non-excludable
- Problem: Little incentive for private actors to make costly investments in R&D, if they can't appropriate the subsequent returns.
- *A prisoners' dilemma*: everyone would prefer free riding on other people's R&D investments without paying the cost.

R&D investment as a prisoners' dilemma

- Two firms (A & B) must decide whether to invest in R&D
- Investing in R&D costs 1.
 - If only one firm invests, it pays 1.
 - If both invest, they pay 0.5 each.
- Benefit from R&D = 3, enjoyed equally by all firms with some market share.
- If one firm has higher costs than the other, it gets outcompeted (payoff = -1).
- **Payoff if both do not invest:** both get 0 (status quo)
- **Payoff if both invest:** both get $3 - 0.5 = 2.5$
- **If firm A invests and firm B does not:**
 - Firm A has higher costs (1 vs 0), gets outcompeted and gets -1.
 - Firm B gets 3 (benefits from the R&D without paying the cost).
 - Opposite happens if B invests and A does not.

Your turn!

Write the payoff matrix for this game

R&D investment as a prisoners' dilemma

Your turn!

Find the Nash
Equilibrium

Firm B

No R&D

Invest in R&D

No R&D

0, 0

3, -1

Firm A

Invest in
R&D

-1, 3

2.5, 2.5

R&D investment as a prisoners' dilemma

Even though R&D investment has a very high social return (100% in this example), it is a dominant strategy for both firms to not do it!

Firm A

No R&D

Invest in R&D

Firm B

No R&D

Invest in R&D

	No R&D	Invest in R&D
No R&D	<u>0</u> , <u>0</u>	<u>3</u> , -1
Invest in R&D	-1, <u>3</u>	2.5, 2.5

The government's role in innovation

- What institutional solutions can address underinvestment in R&D?
- One solution: **Patents** to make scientific discoveries profitable.
 - Make technical knowledge excludable & assign property rights on it.
 - Internalize the externality by allowing inventors to profit.
 - But patents are imperfect, hard to enforce in some sectors, and have important downsides (eg, limit diffusion of knowledge).
- Another solution: **Government** invests in R&D either directly or through subsidies (eg, tax breaks or grants) to private R&D effort.
- Countries usually do a combination of both.

The entrepreneurial state

- Basic research often done (or financed) by the government rather than private inventors.
- In an influential book, Mazzucato argues that most major technological breakthroughs in recent decades have their roots in government programs.
- Technologies that make an **Apple iPhone** possible:
 - **Internet & GPS** (both developed within US Department of Defense)
 - **Touch-screen** (collaborative research within UK & US governments)

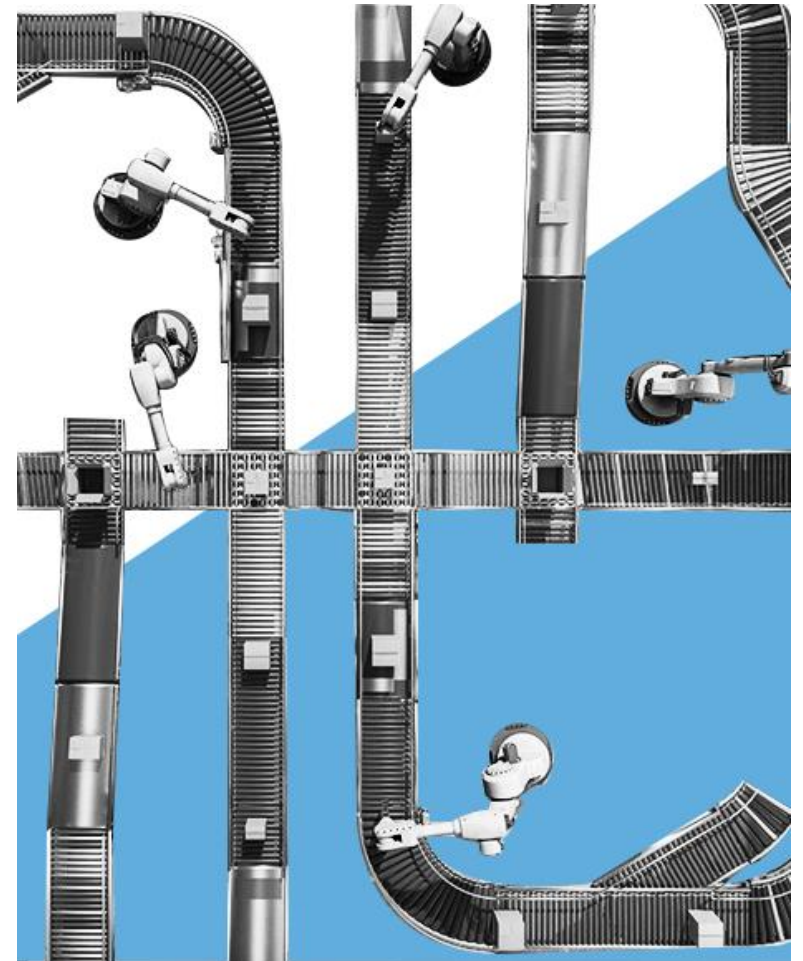


Industrial policy

Public R&D effort is just one example, but more broadly:

Government policies that explicitly aim to transform the structure of the economy by targeting specific industries, firms, or economic activities.

- Selective: target some activities but not others
- Intentional: transforming the economy in a specific way is not a collateral byproduct, but the explicit aim.
- Discretionary: Government decides which sectors/activities/behaviours to promote (and which not).
- Goal-oriented: Specific aims like innovation, productivity, climate transition or good jobs.



Goals of industrial policy

- Inclusive growth.
- Industrialization (in developing countries).
- Development of high-productivity sectors.
- Technological innovation (R&D investment).
- Transition to a green economy.
- Reduction of regional inequalities (place-based policies)
- Creation of “good” jobs (well paying, good working conditions, career prospects, etc.).

Typical tools of industrial policy

- Subsidies & tax breaks.
- State loans.
- Government grants.
- Import tariffs (typically to protect nascent domestic industries).
- Trade finance & trade insurance.
- Local value-added incentives.
- Promotion of Foreign Direct Investment.
- Provision of sector-specific public goods.

Economic rationales for industrial policy

Theoretical justifications of industrial policy are based on various types of market failures.

- Externalities: when some activities have positive externalities, market will underprovide.
- Strategic complementarities: Some beneficial activities might only become profitable if started all together (think about an *assurance game*).
- Economies of scale: some activities might be highly profitable but only after they reach a certain size (or experience).
- Activity-specific public goods: Some activities might require specific public goods, that the market will not provide.



Strategic complementarities: An example

EV manufacturers won't invest heavily in production if there are no charging stations (consumers won't buy cars they can't charge)

Charging station operators won't invest in building networks if there are no EVs on the road (no customers to serve)

Both activities are individually unprofitable without the other, but jointly profitable when coordinated

Your turn!

Solve this game

Charging stations operator

Invest Don't invest

Invest	4, 4	-2, 0
Don't invest	0, -2	0, 0

EV producer

Invest

Don't invest

Strategic complementarities: An example

With strategic complementarities, an economy can get stuck in an inefficient equilibrium.

Government industrial policy can help push producers to the superior equilibrium.

**EV
producer**

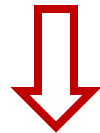
**Charging stations
operator**

	Invest	Don't invest
Invest	<u>4</u> , <u>4</u>	-2, 0
Don't invest	0, -2	<u>0</u> , <u>0</u>

Critiques of industrial policy

Informational shortcomings: Governments do not possess the information required to locate & target market failures.

Political capture: Industrial policy opens the door to self-interested lobbying, political influence and outright corruption.



“Governments cannot pick winners”



Our understanding of industrial policy is still in progress

Industrial policy is difficult to measure

- The same policy might or might not be industrial policy depending on its intentions.
- It is not always reflected in a measurable fiscal cost.

Estimating the effects of industrial policy is very hard

- The government carefully selects the sectors/activities to target
- Given that targeted sectors are “special” in some respects, simple comparisons between targeted and non-targeted sectors are biased.
- Early studies found underperformance of targeted sectors in some countries and interpreted as sign of negative effects
- But it’s a biased comparison because the government targets sectors that are plagued by market failures (and therefore underperforming) to start with.

Industrial policy is on the rise

A recent study [Juhász et al 2022] uses natural language processing models to identify policy changes that constitute industrial policy

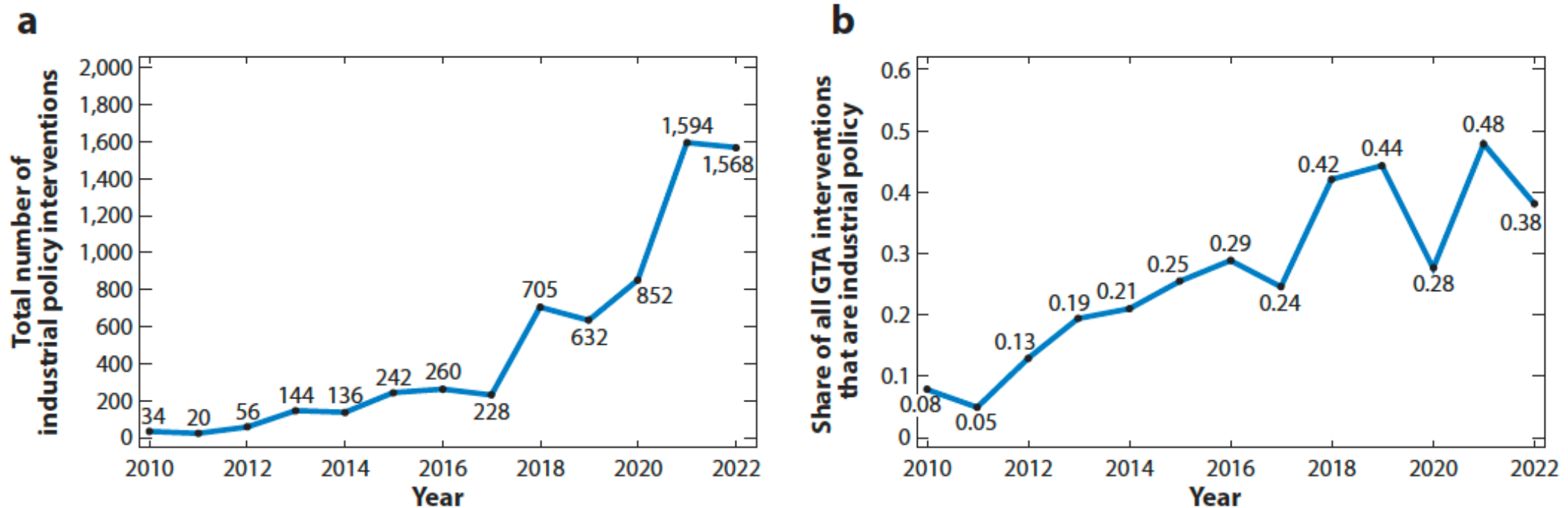
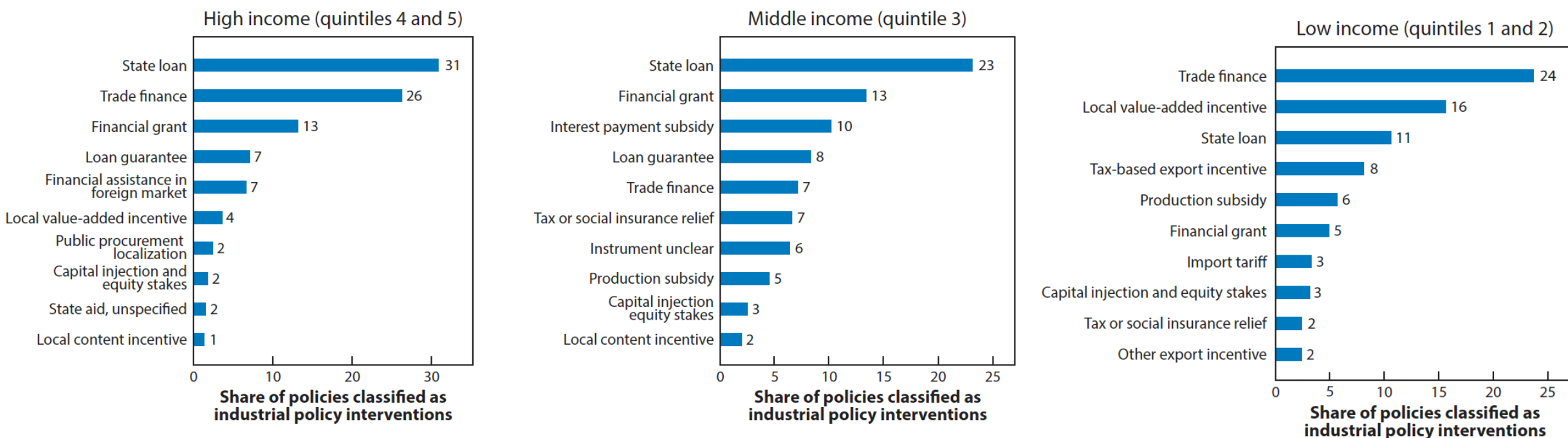


Figure 1

Time trend of industrial policies. (a) Total number of industrial policy interventions globally by year. (b) Share of all interventions classified as industrial policy among all interventions in the Global Trade Alert (GTA) database. Following guidance from GTA, only policies entered in the same calendar year are included to ensure comparability across time. Data from Juhász et al. (2022) (data update July 2023).

Figure 3

Share of industrial policies by measure type. The figure plots the share of industrial policies accounted for by each measure type within a particular income group (top 10 measures reported). Income quintiles based on GDP per capita in 2010. Quintile 5 is the highest-income group; quintile 1 is the lowest-income group. Data from Juhász et al. (2022) (data update July 2023).



A recent example: 2022 CHIPS Act in the USA

- Grants, loans & tax credits to promote investment in semiconductors production.
- Aims to induce world's leading semiconductor companies to produce chips in the US.
- As semiconductor production in USA is more expensive than in Asia, CHIPS Act wants to compensate for the cost differential.
- *National security goals*: reduce dependence on China and Taiwan in an essential industry.
- *Economic goals*: technological spillovers; high-skilled manufacturing jobs for US economy; insurance against global supply disruptions.

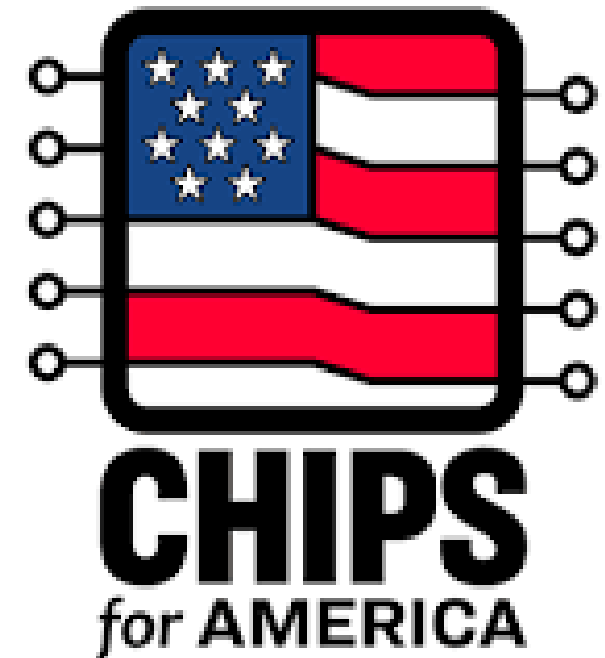
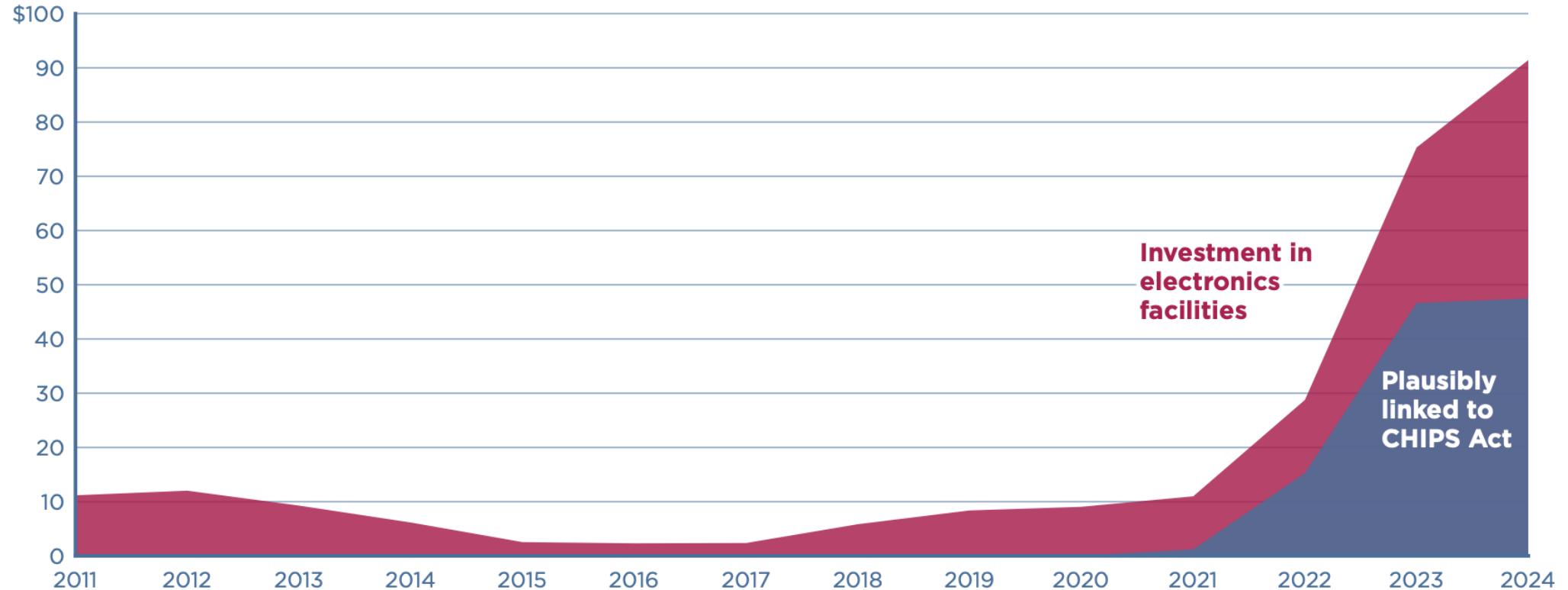


Figure 1

Semiconductor manufacturing investment surged with more US incentives

US investment in construction of electronics facilities and amount likely linked to CHIPS Act, billions of December 2019 dollars, 2011-24



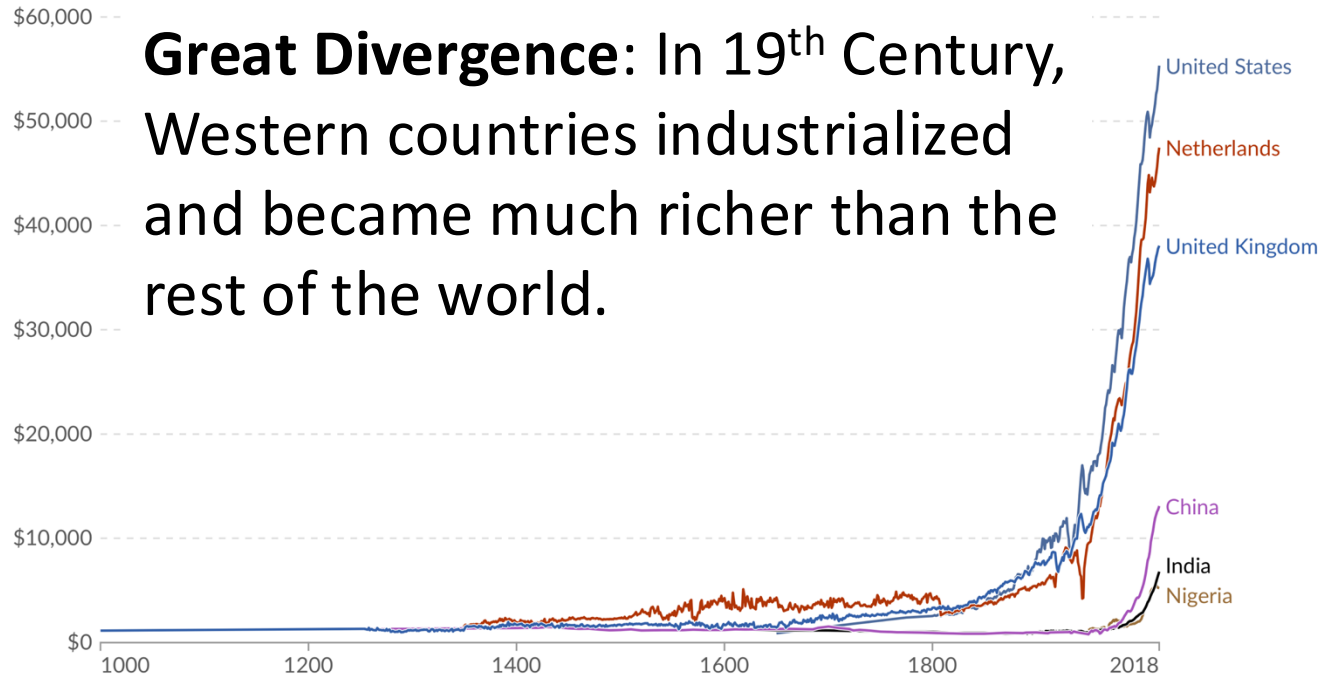
CHIPS = Creating Helpful Incentives to Produce Semiconductors



Source: Author's analysis based on data from the US Census Bureau, Macrobond, and Clean Investment Monitor.

[Download image](#)

Industrial policy & the Great Divergence



Data source: Maddison Project Database (2018)

tinyco.re/28126370 | Powered by ourworldindata.org

Note: The units of measurement is 2011 US dollar. The chart uses ratio scale. CC-BY-ND-NC

Did industrial policy contribute to industrialization in the West?

Economists have started to take this question seriously only recently, and we still don't have a lot of evidence.

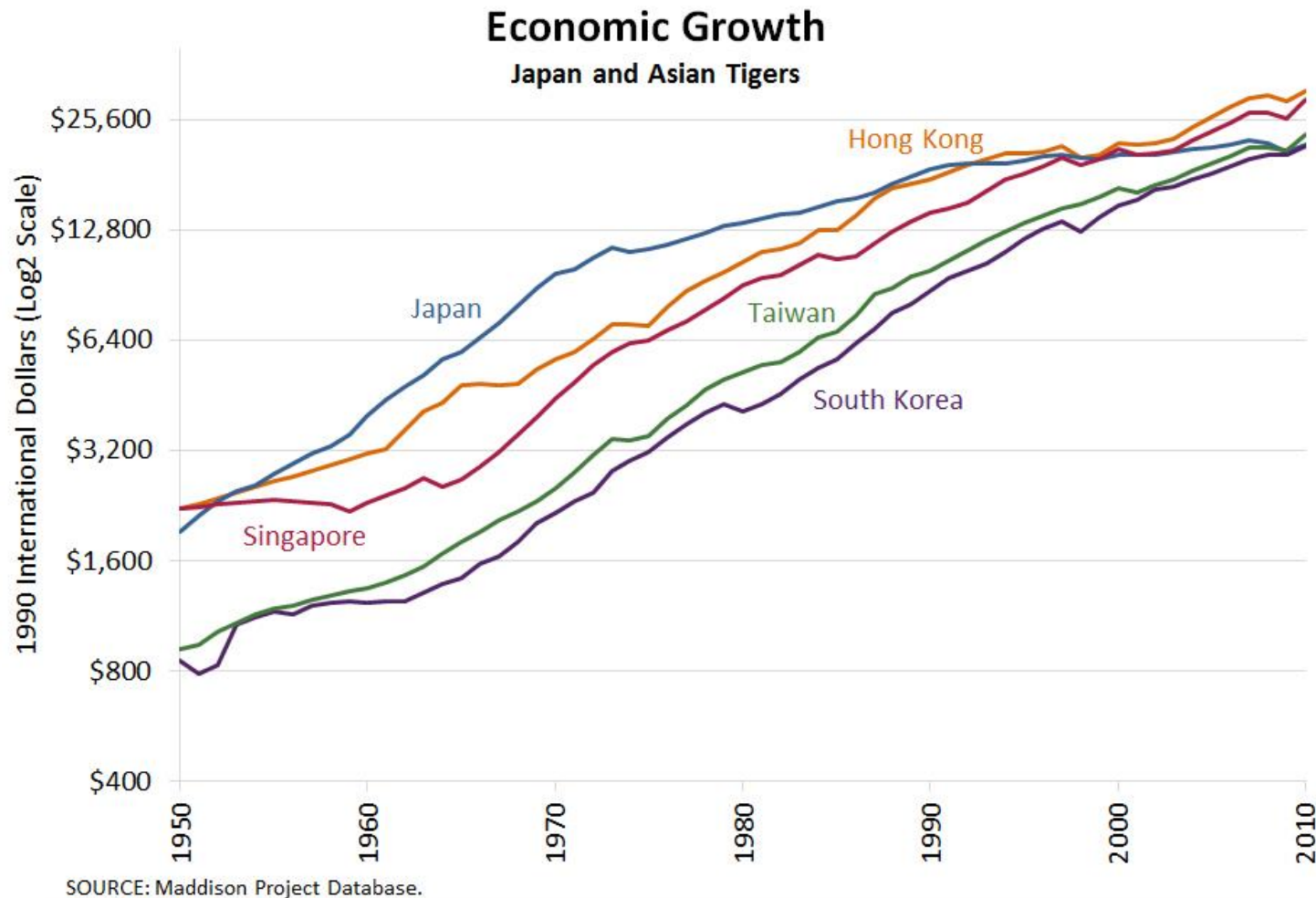
Industrial policy & the Great Divergence

- Britain developed key technologies and organizational forms first (textile and steel factory production)
- Other countries sought to acquire British technologies and build competitive industries, and deployed wide-ranging policies to this end
 - Import tariffs
 - Subsidies for prioritized activities
 - Intellectual property rights (patents) to stimulate innovation
 - Colonial powers also exploited colonies for their industrial policy goals
- Controversial debate on whether these policies helped industrialization.
- But only recently research has started studying empirically what governments precisely did and trying to assess the impacts.

Industrial policy & the Great Divergence

- Four broad types of industrial policies in the 19th Century:
 - Protectionism to nurture nascent domestic industries.
 - Domestic market integration: elimination of barriers to domestic commerce to create a unified national market (internal customs & tolls, lack of transportation infrastructure, ...)
 - Access to foreign markets: Colonialism and Imperialism; Infrastructure investment (ports, railroads, ...); Subsidies for exporters.
 - Access to technology: Governments tried to facilitate imitation of foreign technology and incentivize domestic innovation.
- Some recent evidence suggests positive effects of these three mechanisms on industrialization, but still not have a conclusive answer.

Industrial policy & the East Asian miracle



FEDERAL RESERVE BANK of ST. LOUIS

- *Japan + Asian Tigers*: Biggest development success in modern history.
- Strong growth (7-10% per year) & rapid structural transformation for a few decades.
- By the 1990s they had joined the club of high-income economies.
- Led by *manufacturing exports*.
- *Human capital*: Heavy investment in education and skills.
- *Technological progress* and gradual shift from labor-intensive to high-tech sectors.

Industrial policy & the East Asian miracle

- Japan & Asian Tigers all implemented industrial policy programs, although strategies varied.
- One common feature is that industrial policy in these countries was not protectionist (unlike for example Argentina) but export-oriented, and went hand in hand with trade integration.
- Old and controversial debate on the contribution of industrial policy to the “East Asian miracle”.
- In the past: economists (who denied a role for industrial policy) VS sociologists & political scientists (more positive).
- But now rethinking in economics due to recent research suggesting positive and significant impacts.

Industrial policy & the East Asian miracle

Recent research on the role of industrial policy in the East Asian miracle finds that government targeted the right sectors & positively impacted these targeted sectors.

Case study of South Korea's Heavy Industry Drive (HCI, 1973-1979)

- Steel, shipbuilding, and electronics
- Effective in developing the targeted sectors and their suppliers.
- Long-run effects on industrial development, comparative advantage & productivity
- Positive long-run effects on industrial development, technical knowledge, and productivity.
- *New theories of optimal policy intervention*
 - Suggest that government does not need perfect information on market failures.
 - Instead, optimal sectors to target are those where imperfections are most consequential given their impact through input-output linkages.
 - Find that East Asian industrial policies were optimally targeted to unlock efficiency & productivity gains.

Industrial policy & the East Asian miracle

Important insight from sociological studies:

East Asian industrial policy combined autonomy from private interest groups with institutionalized channels for exchange of information with the private sector, and continual negotiation of goals & policies.

- System of “*embedded autonomy*” (Evans 1995)
- Connections & communication with firms ensured governments had access to the information needed to design feasible policies, adjust to changing circumstances, and direct firms towards the desired technological trajectories.
- But maintaining government autonomy from private interests, to avoid political capture.

Industrial policy in the 21st Century

Countries are using industrial policy quite a lot

- 0.3 to 1.5% of GDP is spent on industrial policy in major economies.
- Over 1/3 of trade policies qualify as industrial policies.
- Higher income countries are heavier users (likely because they have more financial resources).

Tools

- Trade finance, state loans & financial grants the most common interventions.
- Import tariffs (more important in the past) now account for a very small fraction of the interventions: trade policy is no longer protectionist.

Goals

- Productivity & growth still central, but also new objectives:
 - Regional convergence
 - Green transformation
 - Creation of good jobs
 - Insurance against global supply disruptions



Thank you for your attention