US Industrial Policy in Historical Context: Origins, Progress, Challenges

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Abstract

The CHIPS and Science Act and the Inflation Reduction Act of 2022 signaled a renewed political commitment to industrial policy in the United States, after decades of bipartisan skepticism toward state-led economic intervention. This paper places the recent revival in historical perspective by assembling historical series of federal outlays from 1962 to 2024 and tax expenditures from 1967 to 2024. Over time, US industrial policy shifted from visible direct subsidies toward less visible tax expenditures and indirect tools, which received less political attention even though, once general investment incentives are counted, they were of comparable size. We also document the importance of federal credit programs, and changes in trade protection. We compare US expenditures to those of other countries; measured on a comparable basis, US expenditures as a share of GDP are below the average for the European and other OECD economies for which such estimates exist, and likely below those of China. Recent US legislative actions represent a renewed commitment to industrial policy rather than a sharp break with the past.

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I. INTRODUCTION

In August 2022, President Biden signed the CHIPS and Science Act, which provided $39 billion in incentives for semiconductor manufacturing and $11 billion for semiconductor R&D. A week later, the Inflation Reduction Act (IRA) added an estimated $369 billion in clean energy tax credits and related spending commitments.[1] After decades of apparent bipartisan consensus that the United States should not engage in industrial policy, these laws were widely viewed as marking its historic "return". But the United States never truly abandoned industrial policy; it just changed its objectives and instruments over time.

This paper measures the size of US industrial policy over six decades and the instruments through which it has been effected. We find that federal fiscal support for private investment and innovation has remained substantial since the 1960s; under our broad definition (encompassing R&D, energy, and sectorally directed tax provisions) industrial policy has typically amounted to around 0.6–1.0% of GDP, and 1.0–1.9% of GDP when defense R&D is included. The key change has not been in the existence of industrial policy, but in the instruments used and their visibility. The on-budget spending that dominated the Cold War era shifted over time to a more diffuse portfolio of tax-code provisions that attracted less public attention. As noted by Stanley Surrey, spending through the tax code avoids the more rigorous scrutiny applied to direct appropriations (Surrey, 1973). Tax-based support also concentrates benefits on organized business interests and spreads the cost across taxpayers, who seldom notice the revenue lost. These features may explain why the US was long perceived as having little engagement in industrial policy, despite the substantial expenditures we document here.

Our account integrates data from Office of Management and Budget (OMB) tables, Joint Committee on Taxation tax expenditure reports, and agency financial spending. We employ a four-tier definitional framework (narrow, broad, broad + defense, and broad + defense + financial instruments) to accommodate the contested nature of what counts as "industrial policy." We also review at a high level some of the empirical history of US trade policy as industrial policy. Finally, we place the US experience in comparative perspective.

As is commonly recognized, the 1960s were the peak years of targeted industrial policy, with broad + defense spending averaging 1.93% of GDP. We note, however, that the 1980s saw a large expansion of general investment incentives, the Investment Tax Credit (ITC) and accelerated de-

preciation, which we track separately from our headline definitions of "industrial policy". These capital subsidies reached about 1.3% of GDP at their peak in fiscal year 1985 (FY1985). Added to our broad measure, they bring the total to about 2% of GDP, which makes the Reagan era the high point of combined federal support for capital formation. The Tax Reform Act of 1986 then eliminated the ITC and scaled back depreciation allowances. Recent laws such as the CHIPS Act and the IRA mark a shift toward targeted sectoral interventions, specifically in semiconductors and clean energy. In FY2024, broad + defense spending was approximately 1.16% of GDP and about 1.31% when financial instruments are included. Our measurement framework focuses on fiscal instruments—direct spending, tax expenditures, and federal credit programs—and does not capture trade policy interventions such as tariffs, voluntary export restraints, and procurement preferences, which have historically been important instruments of industrial policy. We discuss these additional channels in Section III. On a broadly comparable basis, excluding defense R&D, US support including credit was 0.83% of GDP in FY2024, against an average of 3.65% for the eleven OECD economies covered by the OECD's Quantifying Industrial Strategies project; most of the difference is in government credit.

Our historical analysis traces how the explicit rationale for US industrial policy moved from Cold War technological competition and innovation spillovers to today's concerns with supply-chain resilience, geopolitical rivalry, and the clean-energy transition. Our work complements recent efforts to characterize the extent of industrial policy across countries, for instance by Juhász et al. (2025) and Criscuolo, Lalanne, and Díaz (2022), by focusing on the longer historical experience of a single, important country.

Section II defines the measures and traces their history, including the role of defense, the visibility of different instruments, and federal credit. Section III examines trade policy, Section IV compares the United States with Europe and China, and Section V concludes.

II. US INDUSTRIAL POLICY: 1962–2024

II.1 Defining and measuring industrial policy

II.1.1 The definitional challenge

We define industrial policy as deliberate government action to reshape the structure of the economy in pursuit of public goals that markets alone would not deliver. At its narrowest, industrial

policy refers to direct government subsidies aimed at developing specific industries, activities, or technologies deemed strategic. Most broadly, virtually any government action that affects the sectoral composition of economic activity or the choice of technology can qualify, including exchange rate management and directed credit, trade policy, regulation, infrastructure investment, and basic research funding. Indeed, every country has an implicit industrial policy: the design of the legal system, infrastructure, and education policy shapes the economy.

Definitions in the literature vary widely. Some emphasize targeted sectoral interventions. For example, Pack and Saggi (2006) define industrial policy as "any type of selective intervention or government policy" aiming to redirect production "toward sectors that are expected to offer better prospects for economic growth." Others adopt a more process-oriented view. Rodrik (2004, 2007) characterizes industrial policy as a strategic collaboration between the public and private sectors to identify and overcome obstacles to growth. As set out by Hausmann and Rodrik (2006), industrial policy might be framed as a response to information externalities and coordination failures that impede "self-discovery", or how economies identify their comparative advantage. In a similar spirit, Stiglitz (2017) emphasizes the role of industrial policy in addressing the widespread failures of the market associated with learning, coordination, and structural transformation, arguing that government policy can help shift resources to sectors that generate high social returns in the presence of market failures. Capturing the gains from industrial policies may require them to be properly governed and designed to be competition-friendly. Aghion et al. (2015) find that industrial policies raise productivity growth when they are allocated to competitive sectors or foster competition within a sector.

In this paper we focus more narrowly on expenditure policies directed at impacting the structure of production: outlays and tax expenditures, which are easiest to work into a long-run series. Credit, regulation, trade restrictions, procurement rules, and investment coordination can shape industry without a direct subsidy, but we do not attempt to put those on a common subsidy-equivalent basis. We do, however, discuss credit and trade separately in Sections II.5 and III.

We classify industrial policy support by the sectors, technologies, or activities it favors, without apportioning spending among objectives. Defense R&D is reported separately because the extent of its civilian spillovers is uncertain. Moretti, Steinwender, and Van Reenen (2025) find that defense R&D crowds in private R&D and raises productivity, while Fieldhouse and Mertens

(2024) find large productivity returns to nondefense federal R&D and no comparable return to defense R&D.

To accommodate some of the varying conceptions of industrial policy, we adopt a framework that allows us to consider different definitions. Table 1 reports US industrial policy spending in FY2024 under the alternative definitions described below, both in nominal values and as a share of GDP.[2]

TABLE 1: INDUSTRIAL POLICY DEFINITIONS (FY2024)

Definition	FY2024 Amount	% of GDP
Narrow	$132.9 billion	0.46%
+Defense	$270.9 billion	0.94%
Broad	$196.8 billion	0.68%
+Defense	$334.8 billion	1.16%
+Defense+Finance	$378.6 billion	1.31%

Notes: Definitions are additive, except for the second row, which shows the separate Narrow+Defense definition. Narrow = Civilian R&D (OMB 9.8) + core tax credits (IRC 41, 174, 45X, 48D). Broad = Narrow + outlays in the energy and general science, space, and technology functions (OMB 3.2) other than the R&D already counted in Narrow + targeted tax provisions (energy, vehicle, and domestic production credits, including IRC §40, §45, §45Q, §45V, §48, §48C, §30D, §199, and §250, plus the rehabilitation credit, §47). General investment incentives—the general Investment Tax Credit (IRC §48, through FY1993), accelerated depreciation (ACRS, MACRS, bonus depreciation), Section 179 expensing, and the qualified business income deduction (IRC §199A)—are tracked separately; see Appendix. +Defense adds DoD outlays for research, development, test and evaluation (RDT&E; OMB 3.2). +Defense+Finance adds federal credit programs (DoE LPO, EXIM, SBA, USDA), reported on a face-value basis that differs by program (Table 3), rather than FCRA subsidy-cost equivalents (see Appendix).

The **narrow** definition captures policies primarily justified by innovation externalities, related competitiveness rationales, and other focused objectives. At its core are provisions with explicit innovation and industrial capacity rationales grounded in the R&D spillover literature and the strategic production debates that now surround semiconductors and advanced manufacturing (Griliches, 1992; Rao, 2016; Fazio, Guzman, and Stern, 2020; Fieldhouse and Mertens, 2024). The R&D tax credit, created in 1981 under section 41 of the Internal Revenue Code (IRC), directly subsidizes private research expenditures based on the argument that social returns to R&D exceed private returns. Similarly, R&D expensing (IRC §174) historically allowed immediate deduction of research costs, providing a timing benefit.[3] Two recent provisions, the advanced manufacturing production credit (IRC §45X), introduced by the IRA, and the semiconductor investment

credit (IRC §48D), introduced by the CHIPS and Science Act, are also included in the narrow tier. These provisions support production and investment rather than research, but target technology-intensive sectors whose current policy justification rests on strategic domestic capacity, learning and capability building. The narrow tier corresponds roughly to what Cherif and Hasanov (2019a,b) call technology and innovation policy, which targets sophisticated, R&D-intensive sectors and which they argue distinguished the East Asian successes. The measure is narrow in its economic rationale, not in its targeting. Its outlays are almost all nondefense federal R&D, much of it basic research in health and science that is not specific to any industry.

The **narrow + defense** definition extends the narrow category to include military-related technology spending that, while formally justified on national security grounds, also functions as industrial policy by shaping private-sector technological development. This includes Department of Defense (DoD) outlays for Research, Development, Test and Evaluation (RDT&E; $138 billion in FY2024),[4] including work performed through Federally Funded Research and Development Centers (FFRDCs) such as Lincoln Laboratory.[5] In both the narrow + defense and the broad + defense definitions, the defense layer is DoD RDT&E outlays. Defense procurement is excluded from all of our measures, although procurement contracts have been historically important in establishing new industries.

The **broad** definition adds two things to the narrow one. The first is federal outlays in the energy and the general science, space, and technology budget functions, other than R&D.[6] This adds facilities, operations, and energy programs. The second is sector- and activity-targeted tax provisions beyond the narrow R&D and advanced manufacturing instruments. These include the energy and climate-related tax credits created or expanded under the Inflation Reduction Act of 2022—the production tax credit for renewable electricity (IRC §45), the energy investment credit (§48), carbon capture credits (§45Q), clean hydrogen (§45V), clean energy property credits (§48C), and clean vehicle credits (§30D). It also includes the Domestic Production Activities Deduction (IRC §199, in effect 2005–2017) and the Foreign-Derived Intangible Income deduction (IRC §250), which taxes export-linked intangible income at a reduced rate. These policies change the sectoral composition of economic activity by accelerating investment, production, and technological adoption in targeted industries.[7] In most years the broad layer adds only 0.1–0.25% of GDP to the narrow one, because most federal spending in the science, space, and energy functions is research and the targeted tax provisions were small before the 2000s.

Our baseline broad definition excludes the general investment incentives, which we track separately. These are the Investment Tax Credit (IRC §48, active 1962–1986), accelerated depreciation (IRC §168, including bonus depreciation since 2002), §179 expensing, and the qualified business income deduction (IRC §199A). Although these provisions have historically been substantial, they operate as economy-wide capital subsidies rather than sectorally targeted interventions. Including these general investment incentives would raise the FY2024 broad measure from 0.68% to approximately 0.97% of GDP. Most of that difference in FY2024 is the qualified business income deduction (§199A, $63 billion or 0.22% of GDP), which is not clearly tied to investment. The distinction between targeted and "general" instruments is a design choice. The broad definition captures policies with explicit sectoral, technological, or activity-specific intent, while the general investment incentives represent a broader category of business or capital subsidization for which a characterization as industrial policy is less clear.[8]

The **broad + defense** definition adds the same defense R&D to the broad category. It brings together the instruments aimed at energy, industrial capacity, and national security, and is the (non-trade) measure closest to what is now meant by industrial policy in debates over supply chains and strategic dependence.

The **broad + defense + finance** definition adds recorded support through the credit programs of the Department of Energy (DoE) Loan Programs Office (LPO), the Export-Import Bank, the Small Business Administration (SBA), and the US Department of Agriculture (USDA). Following the OECD Quantifying Industrial Strategies (QuIS) framework (Criscuolo, Lalanne, and Díaz, 2022), we record the face value of loans and the guaranteed amount of guarantees, not their cost under the Federal Credit Reform Act (FCRA), roughly the present value of expected losses. The series therefore reflects the scale of credit support and not its subsidy value. The combined credit series begins in 1996, and its component measures differ (Table 3 and the Appendix).

We exclude state and local business incentives. Estimates by Slattery and Zidar (2020) suggest that state and local governments provide at least $30 billion annually in business incentives (roughly 0.1–0.2% of GDP), while Bartik (2019) estimates between $45 and $60 billion per year. In recent years, these incentives have become increasingly concentrated in large manufacturing "megadeals," such as the subsidies offered to semiconductor and electric vehicle manufacturers including TSMC in Arizona and Hyundai in Georgia. Evidence summarized by Slattery and Zidar (2020) indicates that the average discretionary subsidy package amounts to about $178 mil-

lion for roughly 1,500 promised jobs. Incorporating these state and local incentives would raise our estimate of comprehensive US industrial policy support by roughly 0.1–0.2% of GDP. These incentives differ in kind from the federal measures. Most are firm-specific packages offered in competition with other states to attract or retain a plant, and they are aimed at jobs rather than at technology; to the extent that they simply move activity from one state to another, they may be close to zero-sum for the country as a whole (Slattery and Zidar, 2020).

II.1.2 On-budget versus off-budget spending

Our measurement framework separates on-budget spending from off-budget tax expenditures.[9] On-budget industrial policy appears in appropriations legislation and OMB budget tables in the form of direct grants, contracts, and program spending for R&D, manufacturing support, and infrastructure. Off-budget industrial policy operates through the tax code, appearing as "tax expenditures".[10]

The Congressional Budget Act of 1974 institutionalized tax-expenditure analysis, requiring annual reports from the Joint Committee on Taxation (JCT). These estimates give the revenue cost of each "tax expenditure" which is defined as deviations from a normative tax baseline. For our purposes, we sum the estimated costs of industrial-policy-related provisions to construct the "off-budget" component of industrial-policy spending.[11]

II.1.3 Data sources and coverage

We use three main sources:

- **Office of Management and Budget (OMB) Historical Tables**: R&D outlays by budget function, with rows for the main agencies (Table 9.8), and outlays by function (Table 3.2), covering 1962–2024. The OMB maintains a detailed set of historical spending data, with varying start dates and detail by type of spending.
- **Joint Committee on Taxation (JCT) Tax Expenditure Reports**: Annual estimates of revenue costs for each IRC provision, covering 1967–2029 (with projections). Data was downloaded from the JCT website and extracted manually from yearly tax expenditure reports, with the earliest published in 1973, covering FY1967–72, and the latest published in 2025, with projections out to 2029.[12]

- **Financial Data:** We compiled yearly totals of recorded credit support (loans and guarantees, on bases that differ by program; see Table 3) from the Export-Import Bank of the United States (EXIM), the Department of Energy Loan Programs Office (DoE LPO), the Small Business Administration (SBA), and the US Department of Agriculture (USDA). We start our series in 1996.[13]

Coverage varies by series. Greater detail regarding sources used and how totals are calculated can be found in the Appendix.

These sources do not permit a full breakdown by receiving industry, since tax expenditures are reported by provision and R&D outlays by agency. Where a breakdown can be made, it shows that the sectoral targets have shifted. In FY1966, NASA accounted for about two-thirds of nondefense federal R&D and the NIH for 7%; in FY2024, the NIH accounted for 53% and NASA for 13% (OMB Historical Table 9.8).[14] On the tax side, Table A.2 in the Appendix reports the sectoral incidence of bonus depreciation, a provision for which JCT has released an industry breakdown.

II.2 An industrial policy timeline

US federal industrial policy long predates our series. Hamilton advocated tariffs and bounties in 1791; later policies supported "internal improvements" in transport infrastructure, and agricultural research and diffusion (Fasteau and Fletcher, 2024). Our data starts in 1962, and we divide our timeline by decade. The 1960s were an intense period of Cold War rivalry, which drove direct spending on defense, space, and science. Then, in the 1970s and 1980s, energy security and competition from Japan joined the Cold War concerns, while support increasingly shifted into the tax code. From the end of the Cold War to the mid-2010s, market-oriented ideas prevailed and direct spending declined, but less visible forms of support persisted. Since around 2015, rivalry with China, supply-chain concerns, and economic nationalism have renewed political interest in industrial policy.

We trace this chronology below. We then examine defense spillovers, the political visibility of different instruments, and federal credit.

II.2.1 The Cold War innovation state (1962–1969)

The basic structure of federal support for technological development was already in place in the early 1960s. Industrial policy operated on a substantial scale, driven primarily by defense R&D,

space spending, and federally funded science. This expansion was set against fears of a widening "gap" with the Soviet Union following the launch of Sputnik in 1957. The US response included the establishment of the Advanced Research Projects Agency (ARPA), later renamed the Defense Advanced Research Projects Agency (DARPA), as well as the creation of NASA, both founded in 1958. On each headline definition available for that period, the 1960s had the highest decade-average support in our series (Table 2). Narrow industrial policy averaged 0.90% of GDP. The broad + defense measure reached 1.93%, with defense R&D alone accounting for roughly 0.92% of GDP.

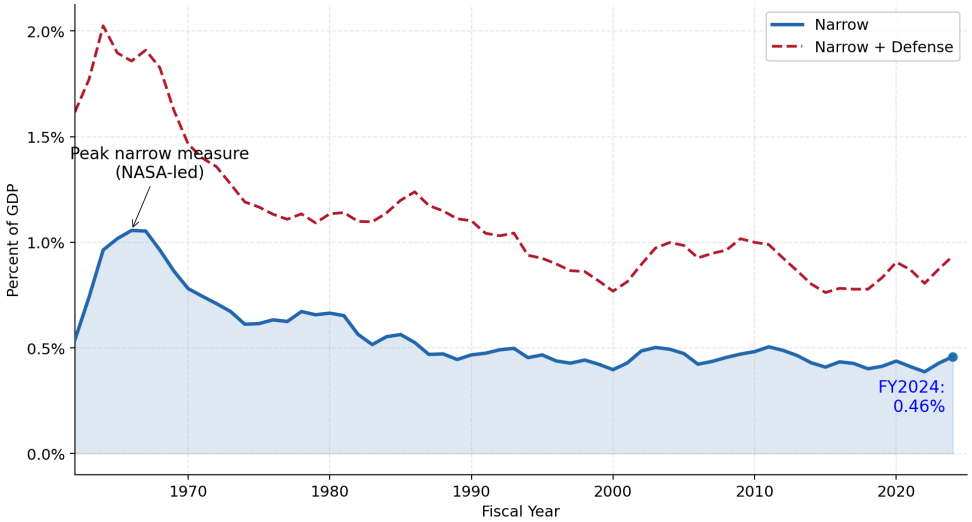
TABLE 2: INDUSTRIAL POLICY SPENDING BY DECADE (% OF GDP)

Decade	Narrow	Broad	+Defense	+Defense+Finance	DoD RDT&E	Finance
1960s	0.90%	1.01%	1.93%	–	0.92%	–
1970s	0.67%	0.82%	1.38%	–	0.56%	–
1980s	0.54%	0.77%	1.38%	–	0.61%	–
1990s	0.46%	0.57%	1.07%	1.22%[a]	0.49%	0.28%[a]
2000s	0.46%	0.56%	1.03%	1.27%	0.47%	0.24%
2010s	0.45%	0.65%	1.05%	1.31%	0.41%	0.26%
2020-2024	0.42%	0.60%	1.05%	1.22%	0.45%	0.17%

Note: Arithmetic means of annual GDP shares; the first and last rows cover FY1962–69 and FY2020–24. General investment incentives are excluded (see Appendix). Finance begins in FY1996; earlier entries are unavailable.
[a] The 1990s Finance and +Defense+Finance entries cover FY1996–99 only; other columns cover FY1990–99, so these decade averages are not additive.
DoD RDT&E is research, development, test and evaluation outlays (OMB Table 3.2), excluding DOE weapons laboratories and procurement. Unlike OMB's conduct-of-R&D series, it includes late-stage development after FY2016 (see Section II.1).

Figure 1 illustrates that industrial policy narrowly defined peaked in FY1966, during the expansion of NASA research. Using the broad definition of industrial policy, Figure 2 shows that the 1960s represent the highest level in the historical series, peaking at about 1.2% of GDP in 1966, driven by the space program. Once defense R&D is added, the peak is about 2.2% of GDP, in 1964. Military R&D and procurement were the federal government's primary instruments, channeling resources to firms, universities, and laboratories (Fieldhouse and Mertens, 2023). Table 2 shows that defense R&D averaged roughly 0.92% of GDP in the 1960s, about twice the 2020–24 average of 0.45%; its annual peak, 1.08%, came in FY1962. This reflected Cold War competition and a widely held belief that technological leadership was essential to national power. The spending also had civilian spillovers in electronics, computing, aerospace, and materials.

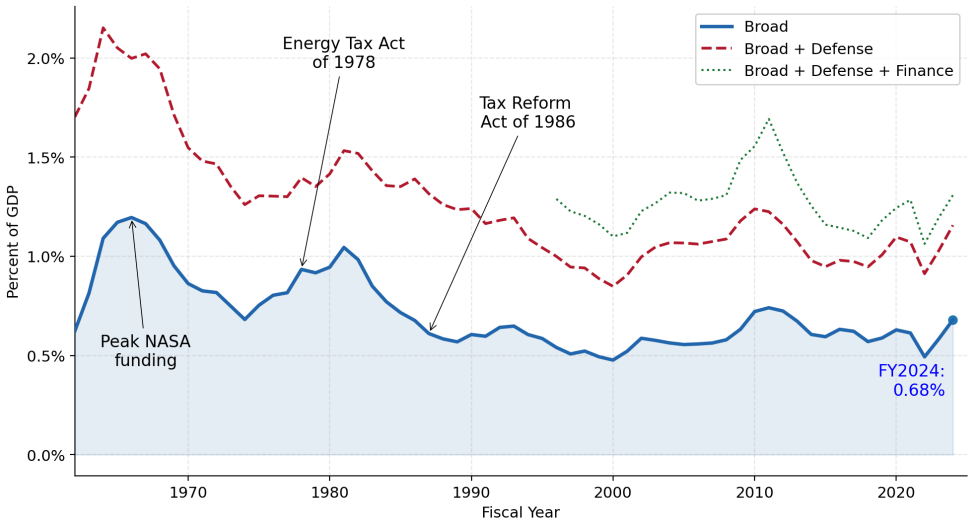
FIGURE 1: INDUSTRIAL POLICY (NARROW) AS SHARE OF GDP, 1962–2024



Notes: The labels identify the NASA-led peak of the narrow measure in FY1966 and its FY2024 value of 0.46%. Data are the nominal value of the industrial policy definition over nominal GDP in a given year. More details on the definition of "Narrow" category and data sources for industrial policy measurements can be found in Section II.1 and the Appendix.

Alt text: Line chart of US narrow-definition industrial policy as a share of GDP, 1962–2024, plotting two series: the narrow measure and narrow plus defense R&D. Both peak in the mid-1960s—about 1% and 2% of GDP respectively—then decline through the 1970s and 1980s and flatten near 0.45% (narrow) and between 0.8% and 1.0% (with defense) from the 1990s onward. Annotations identify the FY1966 narrow-series peak and the FY2024 value.

FIGURE 2: INDUSTRIAL POLICY (BROAD) AS SHARE OF GDP, 1962–2024



Notes: The labels represent the NASA-led broad-series peak in FY1966, the passage of the Energy Tax Act in 1978, the Tax Reform Act of 1986, and the percent of GDP value of the broad definition of industrial policy in FY2024 of 0.68%. The broad definition excludes general investment incentives (ITC, accelerated depreciation), which are tracked separately; see Figure A.1 in the Appendix for an inclusive series. Data are the nominal value of the industrial policy definition over nominal GDP in a given year. More details on the definition of "Broad" category and data sources for industrial policy measurements can be found in Section II.1 and in the Appendix.

Alt text: Line chart of US broad-definition industrial policy as a share of GDP, 1962–2024, with three series: broad, broad plus defense, and broad plus defense plus financial instruments (the last beginning in 1996). The two series that start in 1962 peak in the mid-1960s—broad near 1.2% and broad-plus-defense near 2.2% of GDP—fall to the 1990s, then hold roughly flat, ending at 0.68% (broad) and about 1.31% (broad plus defense plus finance) in FY2024.

The NASA-led Apollo Initiative mobilized national supply chains and created a guaranteed demand for advanced components. Congressional interest in funding NASA fell quickly after the 1969 moon landing.

Federal procurement itself is an important structural policy instrument. The Department of Defense and NASA procurement of integrated circuits in the early 1960s guaranteed markets for nascent semiconductor firms, brought costs down through learning and scale, and helped to launch the modern electronics industry. Large government contracts reduce private risk, ensure markets for emerging technologies, and thus shape industrial development.

Civilian science grew too: the rapid expansion of NIH and NSF appropriations in the 1960s financed university laboratories and basic research through direct grants. Within our headline measures, support in this decade was almost entirely on-budget.

The Investment Tax Credit (ITC) was introduced in 1962, though not originally conceived as an industrial policy instrument. Instead, it emerged from the macroeconomic framework of the Kennedy administration's Council of Economic Advisers who saw it as a tool to shift resources from consumption toward capital formation, with the goal of increasing economic growth.[15] As the ITC was a general investment subsidy applying to all qualifying equipment purchases, not a sectorally targeted intervention, we track it separately from our headline broad definition (see Section II.1). However, the ITC would grow to become at one time perhaps the single largest tax-code instrument affecting industrial structure. It was repealed in 1969, reinstated in 1971, and raised from 7 to 10% under the Tax Reduction Act of 1975 largely in response to the recession and stagflation following the first oil shock of 1973, with further energy-related tax incentives introduced after the second oil shock of 1979.

Our dataset for this period relies primarily on OMB historical tables on R&D and federal outlays beginning in FY1962, which capture direct spending channels.

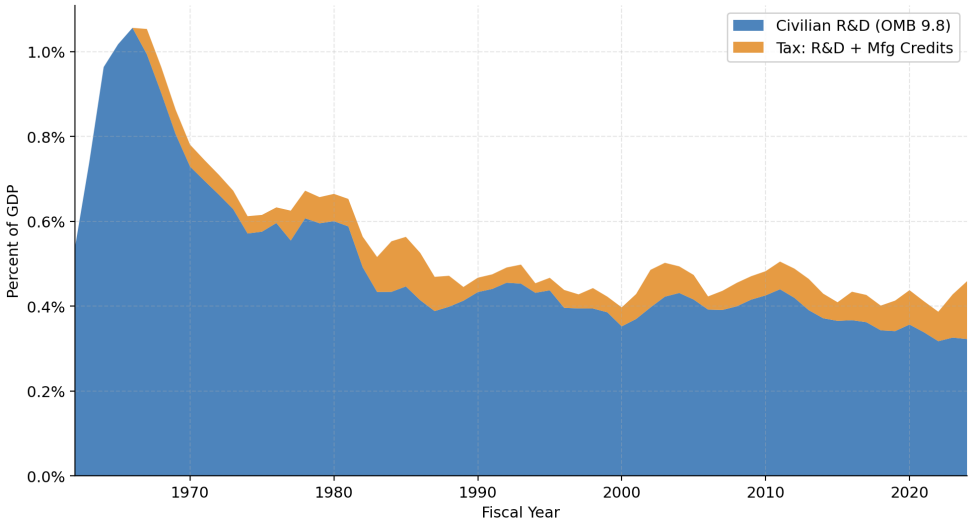
II.2.2 Supply shocks and transition (1970–1979)

The 1970s bridged the Cold War innovation state and the tax-expenditure expansion of the early 1980s. Although not typically characterized as a peak intervention era, the decade marked the shift from the defense- and space-centered policy of the 1960s toward a mixed regime combining direct spending and tax incentives. In the 1970s, federal involvement remained substantial. As shown in Table 2, narrow industrial policy averaged about 0.67% of GDP, the broad + defense

measure about 1.38%, with defense R&D accounting for roughly 0.56%. These levels were below the 1960s peak, but remained historically large relative to most later decades.

Industrial policy spending initially declined before expanding sharply by the late 1970s (Figure 2). The early-decade dip was driven primarily by a contraction in on-budget instruments, especially civilian R&D and science funding which reflected the unwinding of the large commitments of the 1960s, including space-race initiatives and peak defense-linked research spending (Figures 1 and 3).

FIGURE 3: COMPOSITION OF INDUSTRIAL POLICY (NARROW), SHARE OF GDP, 1962–2024



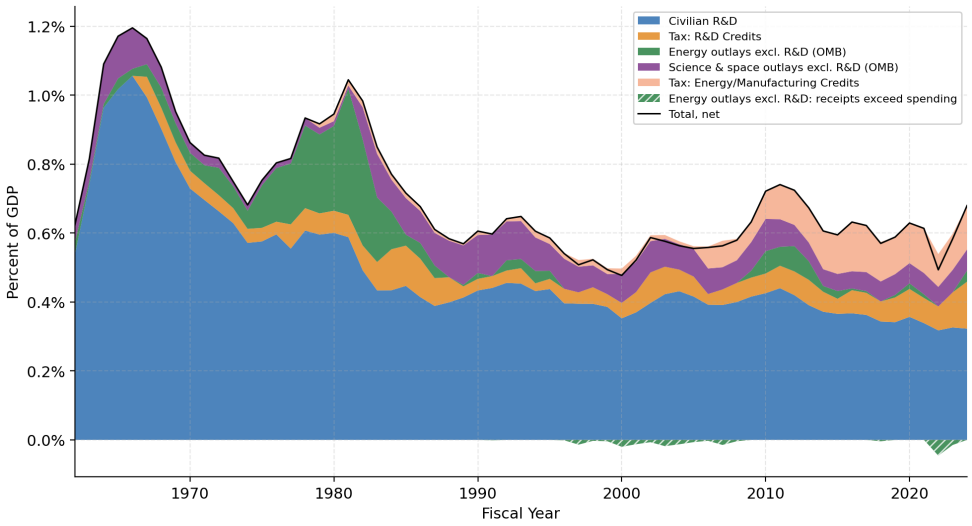
Notes: Figure shows the compositional breakdown of the narrow industrial policy definition between direct outlays and tax expenditures. The blue area shows civilian R&D expenditures as a percent of GDP and the orange area shows the percent of GDP added by tax expenditures (R&D and manufacturing credits). Data are the nominal value of the industrial policy item over nominal GDP in a given year. More details on the definition of "Narrow" category and data sources for industrial policy measurements can be found in the Appendix.

Alt text: Stacked area chart decomposing US narrow-definition industrial policy as a share of GDP, 1962–2024, into civilian R&D outlays (the large lower band) and R&D-plus-manufacturing tax credits (a thin upper band). Civilian R&D dominates and drives the mid-1960s peak above 1% of GDP, declining to roughly 0.4% by the 2000s; the tax-credit band stays small but grows after the 1980s, lifting the total near 0.45% by 2024.

Beginning in the mid-1970s, however, the composition of spending shifted. As Figure 4 shows, energy outlays increased rapidly, as did the separately tracked investment credit and other general incentives (Figure A.1). This coincided with the oil shocks of 1973–1974 and 1979, which elevated the priorities of energy security, domestic production, and capital formation. The federal response combined direct energy spending with growing reliance on tax incentives.[16]

More broadly, defense-driven technological policy was scaled back in the 1970s as Vietnam-era spending decreased, but left intact the central industrial role of the defense sector. Congress

FIGURE 4: COMPOSITION OF INDUSTRIAL POLICY (BROAD), SHARE OF GDP, 1962–2024



Notes: Figure shows the compositional breakdown of the broad industrial policy definition between various direct outlays and tax expenditures. FY2024 broad industrial policy is 0.68% of GDP. The energy and science-and-space bands are outlays in those budget functions other than R&D, which is in the civilian R&D band. Energy outlays are net of offsetting receipts. In the 17 years in which the remainder is negative it is drawn, hatched, below the axis, and the black line gives the net total, whose decade averages are in Table 2. The broad definition excludes general investment incentives (ITC, accelerated depreciation, bonus depreciation, Section 179, IRC 199A), which are tracked separately; see Figure A.1 in the Appendix. Data are the nominal value of the industrial policy item over nominal GDP in a given year. Category "Tax: R&D Credits" includes the tax expenditures in the narrow category, and the category "Tax: Energy/Manufacturing Credits" includes the targeted tax expenditures in the broad category. More details on the definition of "Broad" category and data sources for industrial policy measurements can be found in the Appendix.

Alt text: Stacked area chart decomposing US broad-definition industrial policy as a share of GDP, 1962–2024, into five bands: civilian R&D, R&D tax credits, energy outlays other than R&D, science-and-space outlays other than R&D, and energy/manufacturing tax credits. The mid-1960s peak near 1.2% of GDP is almost entirely civilian R&D; energy outlays swell in the late 1970s and early 1980s; the science-and-space band widens after 1982; the total is about 0.68% in 2024, with tax credits a growing share.

increasingly relied on targeted investment incentives and sector-specific tax provisions to influence the industrial structure. Following the energy price shock and stagflation, policy objectives shifted toward productivity recovery, structural adjustment, and competitiveness, broadening the rationale beyond Cold War technological leadership.

By the end of the decade, broad industrial policy spending was rising steadily, approaching 1% of GDP in 1978–1980, as shown in Figures 2 and 4. When general investment incentives (ITC and accelerated depreciation) are included, the broader measure was about 1.7% of GDP in 1979–1980, foreshadowing the further expansion of these instruments in the early 1980s. Over the decade tax-based tools rose and the rationale shifted from geopolitical technological competition toward "supply-side" transformation.

II.2.3 The Reagan era (1980–1989)

Under our broad definition, the 1980s saw a decline in industrial policy as a share of GDP: the decade average was 0.77%, against 1.01% in the 1960s (Table 2). Including defense, the measure averaged 1.38%, also below the 1960s level of 1.93%. However, this headline picture masks the expansion of general investment incentives in the 1980s.

Two instruments drove this expansion. First, the Investment Tax Credit (ITC) provided a percentage credit against tax liability for qualified investment in equipment and machinery. Expanded in 1981, the ITC cost about $34 billion in FY1985 on JCT's estimates, or 0.8% of GDP. Although the ITC was a general, non-discriminatory credit applying to all qualifying equipment, it disproportionately benefited capital-intensive manufacturing sectors, though no rationale was provided for why such sectors should receive favorable treatment.

Second, the Accelerated Cost Recovery System (ACRS), enacted in the Economic Recovery Tax Act of 1981, shortened depreciation schedules for business assets. This also reduced the effective tax rate on new investment. Combined with the ITC, ACRS made the effective tax rate on equipment investment negative for many firms. Together, the ITC and ACRS peaked at approximately 1.3% of GDP in FY1985, nearly twice the broad industrial policy measure of the same year (0.7%).

In addition, defense R&D spending surged, with an intensification of the Cold War. Federal R&D outlays doubled, from $30 billion in FY1980 to $61 billion in FY1989 (OMB Table 9.8), with defense accounting for most of the increase. This included the Strategic Defense Initiative ("Star

Wars"), while DARPA continued to fund work that later fed commercial technologies, from semiconductors to networking.

If general investment incentives are included alongside our headline broad definition, the mid-1980s emerge as the peak of combined federal support for capital formation, at about 2% of GDP in FY1985. The Reagan administration framed this not as government direction but as "competitiveness" enhancement—a response to Japan's perceived threat to US leadership.

Thus, tax cuts were framed as "returning money to the private sector," rather than "government spending through the tax code." The Reagan coalition united business interests seeking investment incentives with self-identifying deficit hawks who accepted lower revenue as preferable to higher spending. The Cold War provided national security justification for defense R&D that may have been harder to defend on purely economic grounds.

For all its free-market rhetoric, the administration also presided over the era's largest trade interventions: "voluntary" restraints on Japanese automobiles (1981), on steel (1982 and 1984), and on machine tools and semiconductors (1986) sheltered import-competing industries even as the tax code subsidized their capital formation. We return to these episodes in Section III.

Growing deficits made the level of support hard to sustain. The Tax Reform Act of 1986 (TRA86), enacted in Reagan's second term, eliminated the Investment Tax Credit effective January 1, 1986. The ITC's repeal was part of a grand bargain: to broaden the tax base to finance lower rates, achieving "revenue neutrality," and at the same time to simplify the code. The economic logic was that the combination of ITC, ACRS, and tax shelters had created distortions favoring certain investments regardless of economic merit. The reform's consequence was to remove the largest tax-code instrument affecting capital formation: combined general investment incentives fell from 1.3% of GDP in FY1985 to 0.3% in FY1990.

II.2.4 The "End of History" (1990–1999)

The 1990s marked a continuation of the decline in targeted industrial policy that began after the 1960s peak. Under the broad definition, decade-average spending fell from 0.77% of GDP in the 1980s to 0.57% in the 1990s (Table 2). Including defense, the measure dropped from 1.38% to 1.07%. By the end of the 1990s, the combination of tax reform, deficit politics, the end of the Cold War, and ideological shifts had altered how industrial policy worked.

In contrast to the ITC, the R&D tax credit had survived, albeit somewhat precariously. Created in 1981 as a temporary provision, the credit was repeatedly extended in one- or two-year increments, creating uncertainty that undermined its intended incentive effects. The status reflected ambivalence; enthusiasm for subsidizing innovation collided with persistent doubts about how much marginal research it induced. Only in 2015, with the Protecting Americans from Tax Hikes (PATH) Act, would it become permanent.

Deficit reduction dominated fiscal policy in the 1990s. The 1990 Budget Enforcement Act and 1993 Omnibus Budget Reconciliation Act imposed caps and pay-as-you-go requirements that constrained both spending and tax expenditure creation. The end of the Cold War removed national security rationales for defense R&D and the "Washington Consensus" was at its height. "Picking winners" became an epithet. The term "industrial policy" itself fell out of use: Cherif, Engher, and Hasanov (2024) show that references to industrial policy in IMF country reports, frequent in the early 1980s, had become rare by the 2000s. Besley, Brzezinski, and Fazzio (2026), studying seven decades of British parliamentary debate on the size of government, argue that which policy narratives prevail depends on their fit with voters' interests and on motivated reasoning. A famous quip attributed to Michael Boskin, an advisor to George H. W. Bush, encapsulated a common view: "it doesn't matter whether a country makes computer chips or potato chips." Japan's "lost decade" beginning in 1991 tended to discredit the MITI model.

Yet the decade had opened differently. Fear of Japan peaked around 1990, and managed trade was the first response: the 1986 semiconductor agreement was renewed in 1991, and the Clinton administration pressed the 1993 Framework talks with Tokyo and a 1995 auto accord. The early Clinton years also experimented openly with technology policy, expanding the Advanced Technology Program and creating the dual-use Technology Reinvestment Project in 1993, before deficit politics and, after 1994, a Republican Congress cut them back.

The Uruguay Round of GATT negotiations, concluded in 1993-94 with the creation of the World Trade Organization (WTO), imposed new disciplines on industrial subsidies. The Agreement on Subsidies and Countervailing Measures prohibited export subsidies and made other subsidies causing adverse effects to trading partners actionable in WTO courts and subject to possible countervailing measures. While tax incentives for domestic R&D largely escaped WTO scrutiny, the agreement set an international norm against explicit industrial targeting.

II.2.5 A quiet decade, then recession (2000s)

The 2000s continued the pattern of the 1990s, with the broad measure averaging about 0.56% of GDP (Table 2). Apart from the temporary R&D and clean-energy provisions of the 2009 Recovery Act, this period did not see major industrial policy initiatives; instead, incremental changes accumulated against a backdrop of tax cuts, two wars, and a financial crisis. In the last years of the decade, there was an uptick in financial credit programs that continued into the early years of the 2010s, driven by the 2008 financial crisis and the establishment of the Department of Energy Loan Programs Office (DoE LPO).

Two tax provisions are worth highlighting. First, bonus depreciation emerged as a countercyclical tool. Enacted temporarily in 2002 and 2003, bonus depreciation allowed immediate expensing of a percentage of equipment costs—30% in 2002, raised to 50% in 2003. It was framed as a cyclical stimulus, tied to recession rather than long-term competitiveness.

Second, the Domestic Production Activities Deduction (DPAD, IRC Section 199) was enacted in 2004, providing a deduction for income from domestic manufacturing, film production, and certain other activities (Ohrn, 2018). Framed as a response to WTO findings against export subsidies, the DPAD cost about $20 billion a year at its peak: at the full deduction of 9% of qualifying income and a 35% corporate rate, it cut the rate on that income by about three percentage points for any given firm.

China's WTO accession in 2001 transformed trade policy debates, but not US industrial policy as measured here. The focus of competition with China was currency manipulation, intellectual property, and market access[17], not matching Chinese industrial subsidies.

II.2.6 Fiscal constraint and selective expansion (2010s)

The broad measure averaged about 0.65% of GDP in the 2010s and the narrow about 0.45% (Table 2). The Great Recession and its aftermath dominated fiscal policy debate. The American Recovery and Reinvestment Act of 2009 (ARRA) included substantial provisions for R&D and clean energy, but these were temporary stimulus measures rather than permanent policy changes. The 2011 Budget Control Act imposed sequestration (automatic spending cuts) which reduced defense and nondefense R&D in subsequent years. In the 2010s both the narrow measure and DoD RDT&E averaged less than in any earlier decade (Table 2). Credit support peaked in FY2011, a

legacy of the 2008 financial crisis and of the largest DoE LPO lending before the Inflation Reduction Act.

Politics worked against industrial policy. The Tea Party movement made new spending initiatives politically toxic. The failure of the solar panel manufacturer Solyndra, which declared bankruptcy in 2011 after receiving $535 million in federal loan guarantees, became a symbol of government overreach. "Solyndra" joined "picking winners" as a stock argument against later industrial policy proposals.[18]

But international developments made American inaction increasingly anomalous. Germany launched Industrie 4.0 in 2013. China announced Made in China 2025 in 2015, targeting ten strategic sectors with $300 billion in subsidies. The European Commission relaxed some state aid constraints.

II.2.7 COVID and new industrial policy (2020–2024)

The pandemic may have changed thinking about industrial policy more than anything since the 1980s. Shortages of protective equipment, ventilators, and then semiconductors showed the risk of depending on production concentrated in potentially hostile countries. "Reshoring" and "supply-chain resilience" became central to the policy debate.

The CHIPS and Science Act (August 2022) appropriated about $52 billion for semiconductors, of which $39 billion was for manufacturing incentives and $11 billion for R&D, and authorized a wider expansion of federal research funding. A new tax credit (§48D) provides a 25% investment credit for semiconductor fabrication facilities. The legislation explicitly aims to reverse the decline in US semiconductor manufacturing share from 37% in 1990 to 12% in 2020.[19] Recent research indicates that the legislation generated employment gains in semiconductor production and construction sectors, with effects beginning in anticipation of its passage (Erten, Stiglitz, and Verhoogen, 2025).

The Inflation Reduction Act (IRA), enacted in August 2022, added anywhere from approximately $369 billion to $1.97 trillion[20] in clean energy tax credits and spending over ten years. New and expanded credits include §45X (Advanced Manufacturing Production Credit), §45V (Clean Hydrogen), §48C (Advanced Energy Projects), and §30D (Clean Vehicles with domestic content requirements).[21]

The policy case for the revival of industrial policy has drawn on innovation-spillover arguments and, above all, national security concerns. China's semiconductor ambitions are widely seen as a challenge to US technological leadership (You, 2021).

The so-called One Big Beautiful Bill Act (OBBBA), enacted in July 2025, marked a sharp shift. Whereas the IRA relied heavily on sector-specific tax credits to accelerate the clean energy transition, the OBBBA moved back toward a broad, horizontal approach. The legislation made 100% bonus depreciation (§168k) permanent, restored immediate expensing of research and experimentation costs (§174), doubled the limit on immediate expensing of equipment investment by smaller firms (§179), and made the qualified business income deduction for pass-through businesses (§199A) permanent,[22] while phasing out several IRA-era clean technology credits, such as §45V after 2027 and the §45X credit for wind components, and terminating the electric vehicle credit (§30D).[23]

JCT's post-OBBBA projections raise the tax expenditures we track in FY2028 from about $99 billion to $261 billion, net of the credits rolled back (see the Appendix). General investment provisions account for much of the increase, while restored domestic research expensing also enters our narrow tier. The reversal illustrates the importance of political coalitions. IRA credits favored particular clean-energy activities and faced opposition from incumbent fossil-fuel interests. Broad investment provisions had beneficiaries across industries. In this episode, the broad provisions proved more durable.

In addition, the second Trump administration has widened the instruments of federal intervention to include equity stakes in individual firms: in August 2025 the government converted $8.9 billion of grants already awarded to Intel, most of them under the CHIPS Act, into a 9.9% shareholding (Intel Corporation, 2025), and it has since taken positions in producers of rare earths, lithium, and other critical minerals. It has made tariffs its principal instrument, a subject to which we return in Section III. And its budget proposals have sought deep cuts in the civilian research agencies, which Congress has so far largely not enacted. Equity stakes negotiated firm by firm and tariffs set by proclamation are both decided by the executive, largely outside the appropriations process.

II.3 Defense as industrial policy: the national security rationale

Since 1945 defense has probably been the main channel of American industrial policy. The United States has maintained a very large technology policy apparatus continuously since World War II, channeled through defense in a way that has avoided the political stigma of "industrial policy." Block (2008) calls its post-1980 expansion a "hidden developmental state"; Wade (2017) describes a practice of "directional thrust" at odds with the ideology of free markets; and Bonvillian (2024) examines how the federal innovation system and its mission agencies are organized. Although officially justified on national security grounds, Department of Defense R&D, procurement, and technology programs have subsidized private-sector innovation much as an explicit industrial policy would.

Department of Defense outlays for Research, Development, Test and Evaluation (RDT&E) alone were $138 billion in FY2024. On OMB's narrower definition of the conduct of R&D, which since FY2017 has left out late-stage development, they were $93 billion. Related spending includes: the 42 FFRDCs, such as MIT Lincoln Laboratory; DARPA, with a $4 billion annual budget; and DoE national laboratories conducting research extending beyond nuclear weapons into materials science, computing, and manufacturing.

The defense label may shield spending from political opposition: security classification limits what can be seen, and contracts are spread deliberately across congressional districts. Defense-funded research and procurement helped develop several major civilian technologies: semiconductors (the military purchased 100% of integrated circuits in 1962; Mowery and Rosenberg, 1998), the internet (ARPANET), GPS, and commercial aviation.

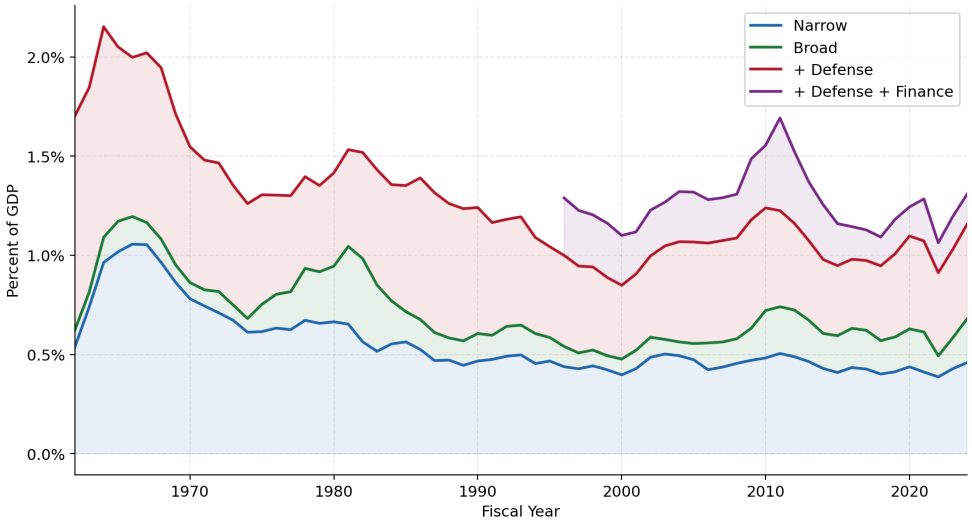
II.4 The visibility of industrial policy

II.4.1 On- and off-budget

Stanley Surrey's formalization of "tax expenditure" analysis began from a simple observation: economically equivalent policies receive politically asymmetric treatment depending on their form. While a $10 billion direct grant to manufacturers appears in appropriations legislation, a $10 billion tax credit for the same manufacturers appears as a "tax cut," and may receive less attention. Figures 3 and 4 trace the shift toward less visible policy instruments—the growing share

of tax expenditures relative to direct appropriations—while Figure 5 shows how each successively broader definition adds further layers of support.

FIGURE 5: INDUSTRIAL POLICY BY DEFINITION AS SHARE OF GDP, 1962–2024



Notes: Figure shows the percentage of each definition of industrial policy of GDP, stacked to show relationship between each definition. Data are the nominal value of the industrial policy definition over nominal GDP in a given year. More details on each definition of industrial policy categories and data sources for industrial policy measurements can be found in Section II.1 and the Appendix.

Alt text: Stacked area chart showing the four nested definitions of US industrial policy as a share of GDP, 1962–2024: narrow, broad, broad plus defense, and broad plus defense plus finance. The bands widen toward the top, illustrating how each broader definition adds spending. The three series that start in 1962 peak in the mid-1960s (broad plus defense near 2.2% of GDP) and decline thereafter; the narrow and defense layers both roughly halve, and the finance layer (from 1996) adds a top band that is widest in 2009–2012.

Surrey warned that this asymmetry would bias policy toward tax expenditures and away from direct spending (Surrey, 1973). Tax expenditures would accumulate and oversight would suffer because congressional tax committees may lack the expertise and staffing to evaluate provisions scattered across the Internal Revenue Code. At the same time transparency would decline because tax expenditures appear as "tax relief".

Indeed, tax expenditures for industrial policy purposes have grown relative to direct appropriations. Within our broad definition they were negligible in the 1960s, about a quarter of the total in the 2010s, and 39% in FY2024, so direct outlays are still the larger part. Counting the general investment incentives, tax expenditures were about 60% of the wider total in the 1980s, fell back to about 40% after the 1986 reform, and have exceeded direct civilian outlays in every year since 2016. Oversight mechanisms exist (including regular tax expenditure budgets, sunset provisions, and programmatic evaluation), but they have not constrained growth.

II.4.2 Political economy of visibility

Why have tax expenditures grown despite their governance deficiencies? The logic of collective action (Olson, 1965) suggests that policies with concentrated benefits and diffuse costs tend to survive. Tax expenditure benefits flow to identifiable corporate beneficiaries who mobilize politically, while costs disperse across all taxpayers who lack both awareness and organization.

Several mechanisms favor tax expenditures. Firms claim tax credits directly on their tax returns, bypassing bureaucratic frictions. Tax expenditures also operate on autopilot, avoiding annual appropriations battles (though pay-as-you-go rules and recurrent deficit politics still may provide some constraint). Politically, these measures benefit from being framed as "tax cuts" rather than "spending," allowing lawmakers to subsidize industry while opposing "big government". Finally, tax provisions are written by the tax committees, Ways and Means and Senate Finance, which have traditionally been friendly to business, rather than by appropriators weighing competing claims.

Outlays and tax expenditures, of course, do not exhaust the instruments of industrial policy. Trade protection, most prominent under Reagan and again under Trump, and government credit have been liberally employed, and neither appears in appropriations at its full scale. These costs are even less visible than the tax expenditures estimated annually by the JCT and Treasury. For loans and guarantees, the budget records an estimated subsidy cost, usually a small fraction of commitments. Who bears the costs of tariffs and quotas depends on their incidence, and must be separately estimated.[24] We quantify federal credit in Section II.5 and take up trade policy at length in Section III.

II.5 Expanding the measurement: federal credit programs

Most of our analysis so far has focused on tax expenditures and direct spending. But the OECD's Quantifying Industrial Strategies (QuIS) project shows that financial instruments (i.e., loans, loan guarantees, and venture capital) constitute a substantial additional channel for industrial support (OECD, 2025). Across 11 initial OECD countries, grants and tax expenditures average 1.53% of GDP, while financial instruments, which the OECD measures at face value and reports separately, amount to a further 2.12%; added together, as we add credit to our US measures, they come to approximately 3.65% of GDP.

Credit was the principal instrument of East Asian industrial policy, and it often worked through preferential access rather than measurable subsidy (Amsden, 1989; Wade, 1990; World Bank, 1993; Stiglitz and Uy, 1996); this is one reason we report commitments rather than subsidy costs. Against that benchmark, what distinguishes the United States is not the absence of government credit but its allocation—overwhelmingly to housing and households rather than to industry.

Whether these policies worked is still disputed. For Korea the recent evidence is favorable (Lane, 2025), and Cherif and Hasanov (2019b, 2025) attribute the East Asian successes to how support was designed: it targeted technologically sophisticated sectors, was tied to exporting, and came with domestic competition and accountability.[25]

TABLE 3: US FINANCIAL INSTRUMENTS FOR INDUSTRIAL POLICY (FY2024)

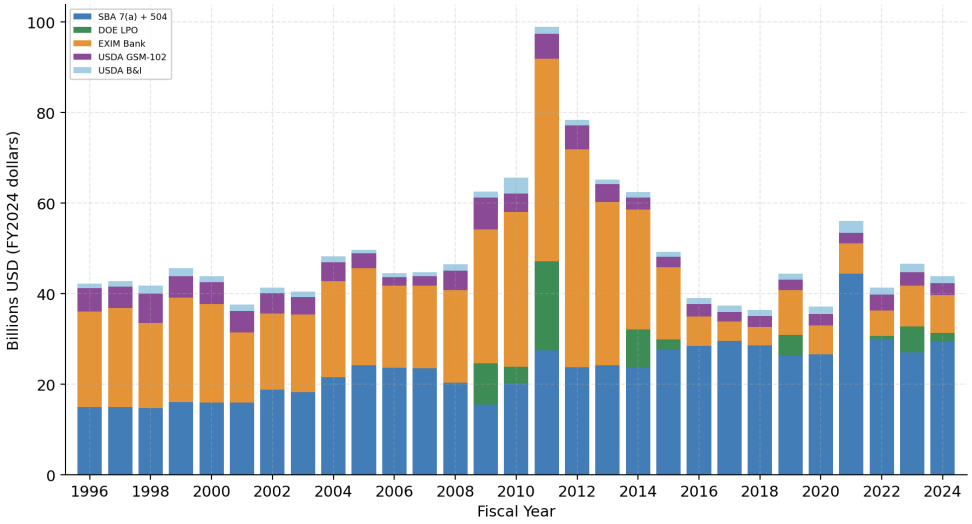
Program	Recorded credit support	% GDP	Description
DOE Loan Programs Office	$1,955M	0.007%	Clean energy and advanced vehicle manufacturing (loans closed)
Export-Import Bank	$8,391M	0.029%	Export financing (loans, guarantees, insurance)
SBA 7(a) + 504	$29,411M	0.102%	Small business loan guarantees (guaranteed amounts)
USDA Credit Programs	$4,118M	0.014%	Ag export credit (GSM-102) + rural business (B&I)
Total	**$43,875M**	**0.152%**	

Sources: DoE LPO reports, EXIM Bank Annual Reports, SBA Activity Reports, USDA FAS/Rural Development. Data are nominal values of each financial instrument over nominal GDP in FY2024. The bases differ by program: DoE figures are loans and guarantees at financial close, by fiscal year of closing, with conditional commitments left out; EXIM figures are authorizations, including export-credit insurance; the SBA figure is the amount the SBA guarantees (gross approvals, which include the lenders' unguaranteed share of 7(a) loans, were $37.8 billion); USDA figures are the guaranteed amount of new commitments in FY2023–24 and, in earlier years, guaranteed loans disbursed to date under each year's commitments (see the Appendix).

To increase comparability with the QuIS figures for other countries, we construct a measure of US federal financial instruments that operate alongside tax expenditures and direct spending as tools of industrial policy. This measure is presented in Table 3. In FY2024, recorded credit support across the major credit and loan guarantee programs amounts to $43.9 billion, or roughly 0.15% of GDP. The largest component is the Small Business Administration's 7(a) and 504 loan programs, with guaranteed amounts of $29.4 billion (0.10% of GDP). This is general small-business finance,

only a fraction of which could be considered targeted industrial policy. The Department of Energy's Loan Programs Office, which supports clean energy and advanced vehicle manufacturing, closed only $2.0 billion of loans in FY2024, but the lending it arranged under the IRA mostly closed after the fiscal year ended: $24.4 billion in eleven loans and guarantees in the last quarter of 2024 (Government Accountability Office, 2025). These programs represent substantial government commitments that shape capital allocation and support targeted sectors of the economy.[26] Federal support for housing is extensive: FHA and VA guarantees and the government-sponsored enterprises back trillions of dollars of outstanding mortgage debt, which implicitly subsidizes the flow of new loans. The tax code also subsidizes owner-occupied housing. In sum, government credit in the US context helps channel capital toward real estate rather than industry—the anti-industrial policy described in Section II.1.[27]

FIGURE 6: US FINANCIAL INSTRUMENTS BY PROGRAM (FY1996–2024)



Notes: DoE LPO expanded under Biden-era legislation; in the decade after the Solyndra controversy (FY2012–22), nearly all its lending went to the Vogtle nuclear plant. The SBA is not typically characterized as industrial policy, but subsidizes capital formation in manufacturing and technology firms. Amounts are in billions of FY2024 dollars.
Sources: DoE LPO reports, EXIM Bank Annual Reports, SBA Activity Reports, USDA FAS/Rural Development.

Alt text: Stacked bar chart of US federal financial instruments for industrial policy by program, fiscal years 1996–2024, in constant dollars. Each bar stacks five programs: SBA 7(a)/504 loans, the DOE Loan Programs Office, the Export-Import Bank, and USDA GSM-102 and Business & Industry credit. Recorded credit support rises to a peak of about $99 billion in 2011, falls below $40 billion in 2016–2018 and 2020, and is about $44 billion in 2024. The DOE Loan Programs Office band is large in 2009–2011, 2014, 2019, and 2023 and small in other years; most of the loans arranged under the IRA closed after FY2024.

In FY2024 dollars, recorded credit support was fairly steady at about $38–50 billion a year from FY1996 to FY2008 (Figure 6). It rose sharply after the financial crisis, to a peak of $99 billion in

FY2011, driven by DoE loan guarantees under the Recovery Act and growth in Export-Import Bank authorizations. It fell back after FY2014, as the Department of Energy's Loan Programs Office made few new loans and the Export-Import Bank, whose charter lapsed for five months in 2015, went without a board quorum until 2019. From FY2016 to FY2024 it stayed between about $36 and $47 billion, apart from a rise in SBA lending in FY2021.[28]

III. TRADE POLICY AS INDUSTRIAL POLICY

Our fiscal measures capture only part of US industrial policy. Following Stiglitz (2017) and Juhász, Lane, and Rodrik (2024), a broader view of industrial policy encompasses three layers. The first consists of the fiscal instruments measured earlier in this paper. The second includes tariffs, local-content requirements, procurement preferences, export controls, and other tools that alter relative prices without appearing as expenditures in fiscal accounts. The third comprises implicit subsidies delivered through regulatory and financial channels, such as selective antitrust enforcement, foreign investment limitations, asymmetric regulation, unmeasured preferential credit, and exchange-rate management. Tariffs and non-tariff barriers (NTBs) can therefore both be considered industrial policy instruments. A tariff that shelters a targeted industry and a tax credit conditioned on domestic content both shift relative prices to influence the sectoral composition of production. This functional definition aligns with a growing literature quantifying the effects of non-tariff measures on trade, welfare, and labor markets (Dhingra, Freeman, and Huang, 2023; Leonardi and Meschi, 2026; Chen, Hsieh, and Song, 2022).

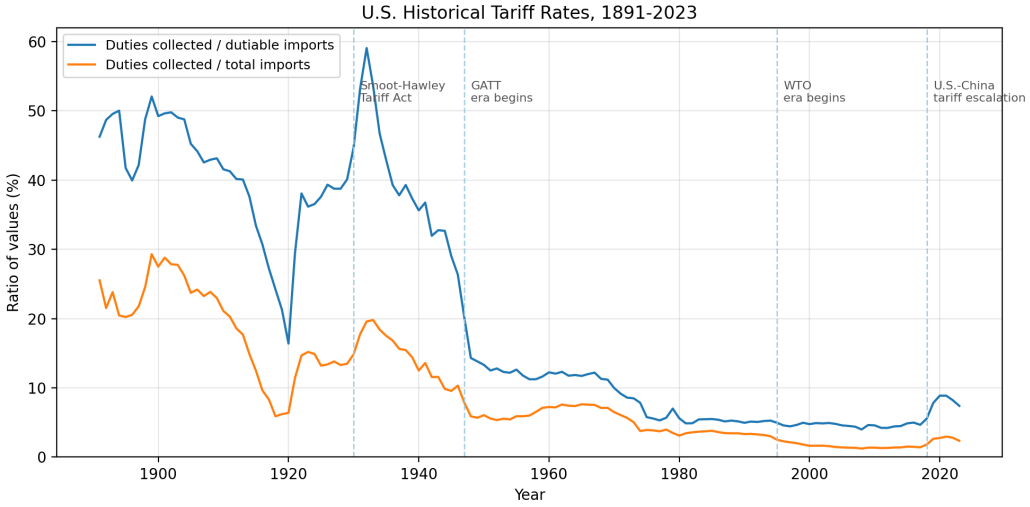
III.1 The changing instruments of protection

The tariff series (Figure 7) and the counts of restraints and trade-remedy cases in force (Figure 8) describe changes in the instruments of protection. As scheduled tariffs fell, the United States used negotiated restraints and selective trade remedies, including anti-dumping and countervailing duties.[29] After 2018, higher tariffs operated alongside subsidies, local-content rules, and investment screening.

III.1.1 From protection to liberalization, 1891–1995

US tariff policy in the late 19th century was defined by high rates to raise revenue and protect domestic industries. The McKinley Tariff Act of 1890 raised rates on dutiable imports close to

FIGURE 7: US HISTORICAL TARIFF RATES, 1891–2023



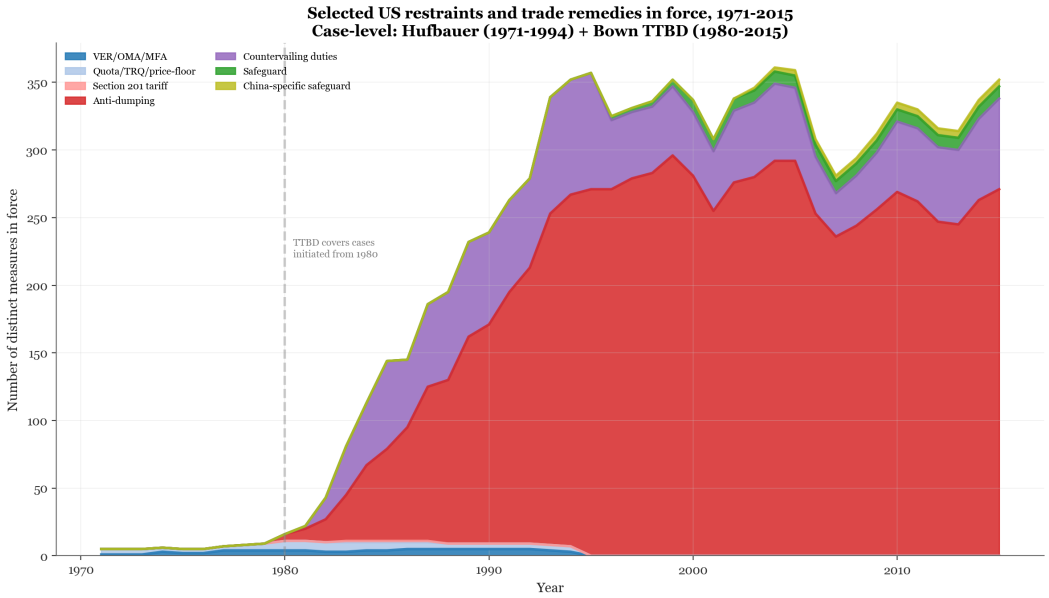
Notes: Duties collected as a share of dutiable imports (blue) and of total imports (orange), with regime breaks marked.
Sources: USITC historical schedules

Alt text: Line chart of US tariff rates from 1891 to 2023, plotting duties collected as a share of dutiable imports and as a share of total imports. Both fall over the long run from high late-19th-century levels; the dutiable-imports line peaks near 60% around the 1930 Smoot–Hawley Act, then declines steeply through the GATT era to low single digits by the 1990s–2010s before turning up after 2018. Vertical lines mark Smoot–Hawley, the start of GATT, the WTO, and US–China tariff escalation.

50%, still short of the more than 60% reached under the tariff of 1828 (Irwin, 2017), and introduced reciprocity. In the post-Civil War years high duties sheltered the domestic iron and steel industry from cheaper British imports. Protection between 1870 and 1910 may have raised employment and output in the protected manufacturing industries but lowered labor productivity (see the review in Acosta et al., 2026). The Payne-Aldrich Tariff of 1909 kept rates high and split the Republican party, contributing to the election of Woodrow Wilson, whose Underwood Tariff Act of 1913 lowered average rates to around 27% and paired the reduction with the newly enacted federal income tax, shifting the primary revenue source away from tariffs (Irwin, 2017).

After World War I, agricultural overproduction (as global production came back online) led to the Emergency Tariff of 1921 and the Fordney-McCumber Tariff of 1922, raising average rates back to around 38%. The Smoot-Hawley Tariff Act of 1930 pushed rates on dutiable imports to nearly 60% by 1932, provoking retaliatory tariffs and contributing to a collapse in global trade. Part of that rise came from global deflation. Many duties were specific, fixed in cents per unit, so falling prices raised their ad valorem incidence. Acosta et al. (2026) estimate that price movements acting on specific duties account for about two-thirds of the variation in the aggregate US

FIGURE 8: SELECTED US RESTRAINTS AND TRADE REMEDIES IN FORCE, 1971–2015, BY INSTRUMENT FAMILY



Notes: Restraint programs and quotas are from Hufbauer's case studies (1971–1994); anti-dumping, countervailing-duty, and safeguard cases are from Bown (2016), whose coverage runs from cases initiated in 1980 to 2015. Orders already in force in 1980 are missing, so the rise in the early 1980s is overstated. Restraint programs are recorded only to 1994, where the Hufbauer–Elliott studies end; some, such as the sugar tariff-rate quota (Table 4), continued. The series is not carried past 2015 because the Global Trade Alert, the source for Figure 9, counts announcements of every kind rather than measures in force.
Sources: Hufbauer, Berliner, and Elliott (1986), Hufbauer and Elliott (1994), Bown (2016)

Alt text: Stacked area chart of selected US restraints and trade remedies in force by instrument family, 1971–2015. Until 1980 the chart shows only five to ten restraint programs and quotas. Anti-dumping and countervailing-duty cases then build up to about 350 in force by the mid-1990s and stay between about 280 and 360 through 2015, with anti-dumping cases roughly three-quarters of the total. The restraint-program series ends in 1994 with its source, and a thin band of safeguard cases appears from the late 1990s.

tariff over the past 140 years. In response to Smoot-Hawley, the Reciprocal Trade Agreements Act of 1934 gave the executive branch authority to negotiate reductions bilaterally, gradually lowering rates from their Smoot-Hawley peak and marking a turning point toward liberalization.

Following World War II, the United States became a leading architect of the General Agreement on Tariffs and Trade (GATT), signed in 1947, which established a multilateral framework for reducing tariffs. Successive rounds progressively lowered tariffs on industrial goods: the Kennedy Round (1967) cut average industrial tariffs by roughly 35%, the Tokyo Round (1979) brought them to around 4.7%. NAFTA (1994) phased out most tariffs among the US, Canada, and Mexico. Figure 7 shows the postwar tariff descent: the sharpest drop in the duties-to-dutiable ratio came in the late 1940s, driven both by the founding GATT rounds and by wartime inflation; the Kennedy

TABLE 4: Selected US voluntary export restraints and quotas, 1971–1994

Program	Years	Instrument	AVE (%)
Japan auto VER	1981–1994	VER	11.0
Steel VRA (1984 round)	1984–1992	VER	30.0
Multi-Fiber Arrangement (apparel)	1974–1994	Quota	48.0
Multi-Fiber Arrangement (textiles)	1974–1994	Quota	23.4
Machine-tool VRAs	1986–1993	VER	46.6
Color-TV OMA	1977–1980	OMA	15.0
Sugar quota / TRQ	1934–	TRQ	30–66
Oil-import quota	1959–1973	Quota	96.0

Notes. Ad-valorem equivalents from Hufbauer, Berliner, and Elliott (1986) Table 1.1 and Hufbauer and Elliott (1994) Table 1.2; basis years vary (1973–1990). These are self-selected high-protection cases, not a representative protection level.

and Tokyo Rounds then completed the decline, cutting average duties into single digits so that by the early 1990s the rate sat near 5%.

Protection moved from tariffs into quantitative restraints negotiated bilaterally and often described as voluntary (the pattern Irwin (2017) traces through the longer history of US trade policy). Because the restraints were nominally voluntary undertakings by the exporting country, they sat outside the GATT's prohibition on import quotas. Hufbauer catalogues major episodes (Table 4): the Japan auto VER (1981–1994), the steel restraint arrangements, the Multi-Fiber Arrangement (1974–1994), the machine-tool restraints, and the sugar quota (Hufbauer, Berliner, and Elliott, 1986; Hufbauer and Elliott, 1994).

III.1.2 WTO discipline, 1995–2017

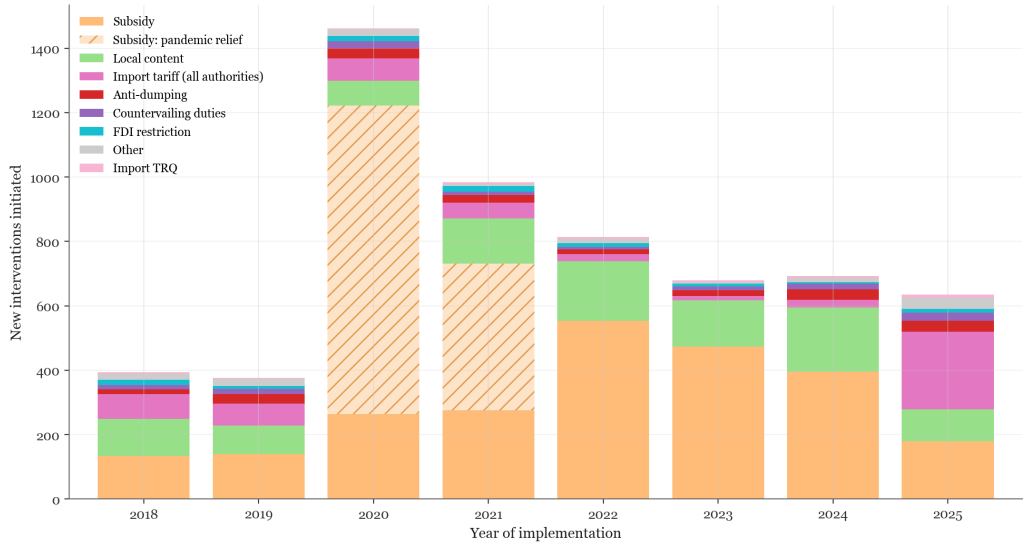
The WTO, established in 1995, further institutionalized low-tariff, rules-based trade. By the end of the century the average US tariff rate had fallen to roughly 1.6% on an all-imports basis, a small fraction of its early 20th-century peak. The Uruguay Round banned VERs in 1994, leaving anti-dumping and countervailing duties, which had already grown through the 1980s, as the main channel of contingent protection. The in-force stock of contingent cases (the broad plateau in Figure 8) rose from a low base around 1980 to about 230 by 1990 and about 350 by the mid-1990s, and then held between roughly 280 and 360 through 2015, overwhelmingly anti-dumping (70% of cases in 1990, 73 to 84% thereafter). Non-tariff measures were widespread: Leibovici and Dunn (2023) find that more than three-quarters of US imports by value were covered by at least one non-tariff measure in 2014.

III.1.3 The new industrial policy, 2018–2025

The belief in local labor-market damage from the post-2001 surge in Chinese imports (Autor, Dorn, and Hanson, 2013; but see Borusyak, Hull, and Jaravel, 2022) and the political priorities of the Trump administration eroded the consensus for liberalization.[30] Trade policy was reframed as national-security policy, reopening the Section 232 and 301 authorities (national-security tariffs under the Trade Expansion Act of 1962 and unilateral retaliation against unfair foreign practices under the Trade Act of 1974, respectively). Pandemic supply-chain disruptions turned the security argument into an industrial policy one, reflected in the IRA and CHIPS Act. The 2018–2020 surge in trade restrictions reflected Trump-era protectionism, but the Biden administration maintained most tariffs while adding further technology export controls targeting China.[31] Recent trade policy, like tax-based industrial policy, appears to exhibit ratchet effects: "crisis-era" measures persist. In addition, the One Big Beautiful Bill Act repealed, from July 2027, the *de minimis* exemption under which shipments worth less than $800 had entered duty-free.[32]

On the tariff side, import tariffs regained prominence for the first time in the postwar era. The average US tariff on imports from China was 3.1% in January 2018, on the eve of the trade war (Bown, 2021). New Section 232 and Section 301 cases arrived in 2018. The aggregate USITC series shows that duties on dutiable imports rose from 4.7% in 2017 to a peak of 8.9% in 2020–21, the steepest sustained increase since the 1930s, easing to 7.4% by 2023. In 2025, the second Trump administration imposed new "reciprocal" tariffs on most US trading partners, with baseline rates around 10% and significantly higher rates on goods from specific countries. Gopinath and Neiman (2026) put the trade-weighted statutory rate at 26% at the end of 2025, the highest in more than a century, but the rate actually paid at 12%. They attribute the gap to shipment lags, exemptions for particular products and companies, use of the USMCA, and evasion. Most of these tariffs were imposed under the International Emergency Economic Powers Act. In February 2026 the Supreme Court held that the Act does not authorize tariffs. The administration replaced them first with a temporary 10% global tariff under Section 122 of the Trade Act of 1974 and then with new Section 301 tariffs, while the Section 232 duties on steel, aluminum, copper, and automobiles remained in place. These fluctuating legal bases and rates are likely to weaken incentives to invest in domestic capacity (Acosta et al., 2026).

FIGURE 9: NEW US TRADE-POLICY INTERVENTIONS BY YEAR AND INSTRUMENT FAMILY, 2018–2025



Notes: The hatched segments are firm-level pandemic relief (Paycheck Protection Program loans, Federal Reserve purchases of corporate bonds, payroll support for airlines), which the Global Trade Alert records one recipient at a time and which we identify from the titles of the entries. They account for two-thirds of the 2020 bar and nearly half of the 2021 bar. More than 700 entries are state rather than federal measures, and about 5% of all entries are classed as liberalizing. The 2025 bar shows tariffs surging; the import-tariff family covers every tariff increase the Global Trade Alert records, including those imposed under the International Emergency Economic Powers Act.
Sources: Global Trade Alert (Evenett and Fritz, 2022), US-imposed, one row per initiation.

Alt text: Stacked bar chart of newly initiated US trade-policy interventions per year, 2018–2025, by instrument family. Each annual bar stacks subsidies, pandemic-relief subsidies (hatched), local-content rules, import tariffs, anti-dumping and countervailing duties, FDI restrictions, and other measures. The bars rise from under 400 interventions in 2018 and 2019 to about 1,450 in 2020 and 980 in 2021, but roughly two-thirds of the 2020 bar and nearly half of the 2021 bar are pandemic relief. Other subsidies peak at about 550 in 2022 and fall to about 180 in 2025, when import tariffs rise to about 240.

Figure 9 reports the post-2018 instrument mix. The Global Trade Alert records 6,037 US interventions introduced between 2018 and 2025 (Evenett and Fritz, 2022). Of these, 63% are subsidies and 17% local-content provisions, against 9% import tariffs and 5% anti-dumping, countervailing-duty, and safeguard cases.[33] Programs such as the IRA's clean-energy and manufacturing credits, the CHIPS Act, expanded Buy American rules, the Connected Vehicles Rule, and broadened investment screening are meant to reshape domestic production, not to answer specific import surges.[34]

Thus, in the recent period, tariffs and non-tariff instruments have been used together: tariffs imposed from 2018 stayed in force while subsidies and local-content rules multiplied, and the largest tariff increases came in 2025. They have also been aimed at the same sectors. The increases in Section 301 duties announced in May 2024 fell on electric vehicles, batteries, solar

cells, and semiconductors, the sectors that the IRA and the CHIPS Act subsidize, as well as on steel and aluminum (Office of the United States Trade Representative, 2024).

IV. AMERICAN INDUSTRIAL POLICY IN INTERNATIONAL CONTEXT

We now examine how the American industrial policy instruments we have discussed compare with those used in Europe and China, where intervention often takes more visible forms such as direct subsidies and notified state aid, alongside policy bank lending and local government financing vehicles. The OECD's tracking of R&D tax incentives documents a global trend toward tax-based support, with the US as a pioneer but no longer an outlier. Most OECD countries now offer some form of R&D tax credit or super-deduction (OECD, 2024). Indeed, all three of the US, the OECD surveyed countries, and China use a mix of grants, tax provisions, and credit.

IV.1 Comparative overview

On headline measures of civilian grants and tax expenditures (excluding defense), the US (0.46–0.68% of GDP, spanning our narrow to broad definitions) spends 30–45% of OECD QuIS project estimates (Table 5). OECD QuIS covers eleven OECD countries, including eight EU member states, and estimates support of 1.53% in 2022 (OECD, 2025). However, there are some key definitional differences between sources. The OECD data does not include support for the production of energy, only measures that reduce the cost of energy for businesses, while US financial data does not include regional instruments as defined by the OECD (instruments designed to support businesses in specific geographic regions), which would be most similar to state and local policies in the US. QuIS also counts support for general firm investment (0.29% of GDP on average in 2022), which our headline US measures track separately; adding the US general investment incentives (Section II.1) would still leave the US below the QuIS average.

The QuIS figures cover mainly national governments, including lending by national development banks such as KfW, along with EU-funded instruments in the member states. Subnational coverage is uneven. Adding the estimated US state and local incentives would bring the civilian total including credit to about 1% of GDP, still below the QuIS average. The comparison also uses different years: the 2022 OECD benchmark includes energy-crisis support, whereas our US figures are for FY2024.

TABLE 5: INDUSTRIAL POLICY COMPARISON: US, SELECTED OECD ECONOMIES, CHINA

Metric	US (FY2024)	OECD QuIS-11 (2022)	China
Grants + tax expenditures (civilian)	0.46–0.68%	1.53%[a]	n.a.[b]
Defense RDT&E	0.48%	n.a.	n.a.
Financial instruments	0.15%	2.12%[a,c]	n.a.[b]
Total, civilian	**0.61–0.83%**	**3.65%**[a]	CSIS: 1.73% (2019); IMF: 4.4% (2023)[b]
Total incl. defense R&D	∼1.31%	n.a.	n.a.
Primary mechanism	R&D outlays + tax expenditures	State aid + credit	Credit + subsidies
Flagship programs	CHIPS; IRA	NGEU; IPCEI	MIC2025

[a] OECD Quantifying Industrial Strategies (QuIS) average across eleven countries (Canada, Denmark, France, Germany, Ireland, Israel, Italy, Netherlands, Slovenia, Sweden, UK), not an EU-specific figure (OECD, 2025). The OECD reports financial instruments, at notional value, separately from grants and tax expenditures; the total is our sum. The QuIS figures exclude defense R&D.

Notes: The European Commission's State Aid Scoreboard reports approximately 1.5% of EU GDP in 2022 and 0.94% in 2024. It covers aid reported by member states under the EU state-aid rules, block-exempted as well as notified, and includes tax exemptions; it leaves out EU funds, general measures, and *de minimis* aid. Its coverage and valuation differ from those of QuIS.

[b] DiPippo, Mazzocco, and Kennedy (2022) (CSIS) put support at 1.73% of GDP in 2019, a figure they describe as conservative. It combines nine instruments, among them direct subsidies, tax incentives, below-market credit to state-owned enterprises, government guidance funds, and below-market land sales. It leaves out subsidies to unlisted private firms and instruments that cannot be quantified, such as procurement preferences and market-access restrictions. Garcia-Macia, Kothari, and Tao (2025) (IMF), counting cash subsidies, tax benefits, subsidized credit, and subsidized land, put the equivalent fiscal cost at 4.4% of GDP in 2023.

[c] The 2.12% financial-instruments figure is elevated by a single 2022 German energy-crisis loan scheme (KfW Sonderfinanzierungen Energiesektor, ∼1.4% of German GDP that year). Excluding it, the QuIS-11 financial-instruments average is closer to 2.0%—essentially unchanged from 2019 (OECD, 2025).

Notes: Flagship programs include: Creating Helpful Incentives to Produce Semiconductors (CHIPS); Inflation Reduction Act (IRA); NextGenerationEU (NGEU); Important Projects of Common European Interest (IPCEI); Made in China 2025 (MIC2025)

Comparability caveat: No row is directly comparable across columns. The civilian total excludes defense R&D, as the OECD and China figures do. The OECD QuIS figures partially capture multi-level government spending but exclude regulatory and single-market industrial policy (CAP, common external tariff); China's published figures severely understate it. US excludes state/local incentives (∼0.1–0.2% GDP).

Adding financial instruments widens the gap. QuIS records a further 2.12% of GDP in financial instruments (loans, loan guarantees, venture capital) in 2022; adding them gives approximately 3.65% of GDP. The US deploys only 0.15% of GDP in industrial support through federal credit channels, while its support for households and housing is much more substantial. About 70% of the gap (1.97 of 2.82 percentage points) reflects lower American reliance on government credit programs for industrial policy.

China very probably exceeds the United States, though comparisons are difficult to put on the same basis (Section IV.3). Because the three columns of Table 5 do not measure the same thing, the table should best be read as indicative of broad magnitudes rather than precise comparisons.[35]

IV.2 The European Union

The Treaty on the Functioning of the European Union (Article 107) prohibits state aid that distorts competition within the Single Market.[36] Recent developments have loosened constraints. The Temporary Framework for COVID-19 response permitted extensive emergency support. The Important Projects of Common European Interest (IPCEI) exception further expanded policy space by allowing multinational industrial programs in strategic sectors such as batteries, microelectronics, and hydrogen. The Net-Zero Industry Act (2024) streamlines permitting and provides some funding for clean technology manufacturing.

Yet European industrial policy through direct state aid remains modest in headline terms. The European Commission State Aid Scoreboard, which covers aid reported by member states under the state-aid rules (block-exempted as well as notified, and including tax exemptions), reports a total of 0.94% of EU GDP dedicated to state aid expenditures in 2024.[37] This aid is granted by the member states, not by the Union. Germany alone accounted for about a quarter of the 2024 total and France for a fifth (European Commission, 2026). The NextGenerationEU, the €800 billion recovery fund, includes substantial investment components but spreads across 27 member states over multiple years.

IV.3 China

Quantifying Chinese industrial policy is challenging given limited transparency. The Center for Strategic and International Studies (CSIS) estimates support at 1.73% of GDP in 2019 (DiPippo,

Mazzocco, and Kennedy, 2022). The estimate counts direct subsidies, tax incentives, below-market credit to state-owned enterprises, government guidance funds, and below-market land sales, and its authors call it conservative. Several additional channels are not fully quantified. Local government financing vehicles (LGFVs) borrow for infrastructure and some industrial projects with perceived local-government backing. This debt amounts to around half of GDP (Hendy, Ryan, and Taylor, 2024), but we do not have good data on its industrial share or its subsidy equivalent. Policy banks, including the China Development Bank and the Export-Import Bank of China, lend below market rates to priority sectors. Sub-national governments compete for manufacturing investment with land subsidies, tax holidays, utility discounts, and direct grants, little of which appears in national statistics. Finally, government guidance funds, quasi-public venture capital vehicles that have multiplied since 2014, are counted only on assumptions CSIS describes as conservative; they are directed at strategic sectors such as semiconductors.[38]

Fully accounting for these, Chinese support would plausibly be well above US levels. A recent IMF estimate that counts tax benefits, subsidized credit, and subsidized land alongside cash subsidies puts the fiscal cost at 4.4% of GDP in 2023 (Garcia-Macia, Kothari, and Tao, 2025). [39]

V. CONCLUSION

The widely held view that industrial policy disappeared in the United States after the Cold War is historically inaccurate. Instead, federal intervention aimed at shaping investment, innovation, and industrial structure has persisted for decades: industrial policy under our broad definition has averaged between 0.6 and 1.0% of GDP by decade, and between 1.0 and 1.9% when defense R&D is included. The broad measure fell by about two-fifths between the 1960s and the 2020s, and by about 45% with defense R&D included, as the Apollo program ended and defense research shrank relative to the economy. But over the same years, tax expenditures and other indirect mechanisms, which attract less political attention, grew. They are now 39% of the broad measure; counting the general investment incentives, they have exceeded direct civilian outlays since 2016.

We have documented shifts in the composition of federal fiscal support over time. The 1960s Cold War innovation state represented the peak of targeted industrial policy as a share of GDP, with broad + defense spending averaging 1.93% of GDP—a level not approached in any subsequent decade. Under Reagan the general investment incentives, the Investment Tax Credit and accelerated depreciation, grew to about 1.3% of GDP; together with the broad measure they made

the mid-1980s the peak of combined federal support for capital formation in our series. The 1986 reform cut these incentives back, and the tax share of federal support fell with them. It rose again from the 2000s, with the R&D credit, sector-specific energy provisions, and bonus depreciation. Finally, the legislative initiatives of the 2020s, including the CHIPS and Science Act and the Inflation Reduction Act, represent a partial return to more visible sectoral interventions, particularly in semiconductors and clean energy, while the OBBBA's restoration of broad-based depreciation provisions shows how durable general investment incentives can be politically.

Our review of the history of US trade policy points to a similar pattern: lower scheduled tariffs coexisted with quantitative restraints and selective trade remedies, but since 2018 tariffs have returned alongside subsidies and local-content rules. This pattern of joint use has often been justified on security grounds, though the Trump tariffs seem poorly designed to achieve any national goal, industrial policy or otherwise.

On a broadly comparable civilian basis, US grants, tax expenditures, and face-value credit support are below the average support documented by the OECD QuIS project. The available estimates also suggest greater support in China, although coverage and valuation differ. But US industrial policy expenditures have long been substantial. The distinctive feature of the US system is not the absence of industrial policy but its composition: the US makes heavy use of tax expenditures—both targeted sectoral provisions and general investment incentives (which perhaps should not even be considered as part of industrial policy)—and far less use of government credit relative to GDP.

Many questions remain open about how best to design industrial policy and what have been the effects of various types of interventions.[40] What we have tried to emphasize in this paper is that it is important to have a full and transparent accounting of industrial-policy expenditures, one that includes less-visible tax expenditures as well as more-visible targeted sector subsidies. Especially as recent US policy (with the OBBBA) has moved back toward the early-1980s mix of permanent general investment incentives and reduced targeted credits, this point seems particularly important to keep in mind.

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NOTES

[1]The Senate Democrats' summary of the bill put its energy-security and climate provisions at $369 billion over ten years on the basis of Joint Committee on Taxation estimates (Senate Democratic Caucus, 2022); see also Congressional Budget Office (2022). Later projections ranged from $0.8tn to $1.97tn over a decade (see Fisher and Loucks, 2025), because most of the credits were uncapped by the statute.

[2]We adopt a narrower scope than the conceptual definitions above suggest: we measure direct federal outlays, federal tax expenditures, and federal credit programs. We also present some components of trade policy. But we do not measure regulatory preferences, procurement-as-industrial-policy, state and local incentives, household-directed credit (Fannie Mae, Freddie Mac, FHA), or implicit subsidies that operate through channels such as financial repression, exchange-rate management, or selective regulatory enforcement. Each of these is plausibly a component of US industrial policy. Capital account regulations constitute another instrument outside our fiscal measures (Erten, Korinek, and Ocampo, 2021). Our figures for outlays and tax expenditures therefore understate federal support. The credit layer is different: it records the face value of commitments, which measures scale and not cost.

[3]The differential narrowed after 2017: the Tax Cuts and Jobs Act extended immediate expensing (100% bonus depreciation) to most equipment investment, even as it scheduled §174 research costs for five-year amortization from 2022 (a change reversed in 2025). JCT reports no tax expenditure for §174 in FY2024.

[4]OMB Historical Table 3.2. OMB also publishes a narrower series, the Department's outlays for the conduct of R&D (Table 9.8), which from FY2017 no longer counts the late-stage development of major equipment. We use RDT&E outlays to avoid this break and to include late-stage defense development. On the narrower series the defense layer would be 0.36% of GDP in the 2010s and 0.29% in 2020–24, where Table 2 shows 0.41 and 0.45 (see the Appendix).

[5]It does not include Department of Energy (DoE) weapons laboratories (e.g., Los Alamos, Sandia, Lawrence Livermore), which are funded through the National Nuclear Security Administration (NNSA) budget. OMB records their R&D outside the Department of Defense (about $5.5 billion in FY2024), so our "civilian" series includes this weapons research.

[6]The research carried out within these two functions, which includes nearly all of NASA's spending in the Apollo years, is already in the narrow measure (see the Appendix).

[7]Our baseline definitions exclude federal transportation spending (e.g., highways and general transportation programs), consistent with the OECD's definition (Criscuolo, Lalanne, and Díaz, 2022). Under a very broad interpretation transportation might be considered "industrial policy"; federal transportation outlays were about 0.47% of GDP in FY2024 and 0.68% in FY2020.

[8]Some of the largest standing federal interventions tilt the allocation of capital *away* from industry: the mortgage-interest deduction, federal mortgage guarantees, and related supports for housing and finance amount, in effect, to an *anti-industrial* policy. Part of measured industrial policy thus merely offsets distortions created elsewhere in the fiscal system.

[9]We use "off-budget" loosely, for support that does not pass through appropriations. This is not the statutory sense, which refers to the Social Security trust funds and the Postal Service. Tax expenditures are reported in budget documents, as revenue forgone, not outlays.

[10]The tax expenditure concept originated with Stanley Surrey's tenure as Assistant Secretary of the Treasury for Tax Policy under Presidents Kennedy and Johnson. Surrey observed that many provisions in the tax code functioned identically to direct spending programs, but escaped budgetary scrutiny (Surrey, 1973; Surrey and McDaniel, 1985; United States Department of the Treasury, 1969).

[11]Two caveats apply to the tax data. First, JCT tax-expenditure estimates do not model how taxpayers respond to incentives; the cost depends on unobserved counterfactual behavior. Second, what counts as a "tax expenditure" depends on what counts as baseline taxation. We follow JCT conventions. In addition, individual JCT tax-expenditure estimates are not additive: each is calculated independently assuming all other tax provisions remain in place, so summing them ignores interaction effects. We sum the relevant provisions, so the resulting series is an approximation.

[12]We also cross-reference the National Priorities Project (NPP) Database for validation, and use it where JCT gives no value for a provision in a given year (see the Appendix). The NPP contains digitized historical tax-expenditure data from OMB documents, covering 1974-2019.

[13]The DoE LPO (now the DoE Office of Energy Dominance Financing) began issuing loans in 2009.

[14]NASA research outlays fell from 0.15 to 0.06% of GDP between FY1981 and FY1983, as Shuttle development ended and operations began. The broad measure includes both R&D and other NASA outlays; the narrow measure records only R&D. The data do not distinguish a change in classification from a real shift away from development.

[15]The CEA was chaired by Walter Heller and included James Tobin as a member, with Robert Solow and Kenneth Arrow among its staff economists.

[16]Part of the energy spending was stockpiling: purchases for the Strategic Petroleum Reserve were about 0.04% of GDP in 1978–79 and 0.1% in 1981–82.

[17]Market access resulting from WTO accession also accelerated structural transformation in China as counties more exposed to reductions in tariff uncertainty experienced increased exports and foreign direct investment, a contraction of agriculture, and an expansion of secondary-sector activity (Erten and Leight, 2021).

[18]Tesla, which received a $465 million DoE loan at the same time, has a market valuation at the time of writing of about $1.5 trillion, or around 75% of the assets under management of the Norwegian Sovereign Wealth Fund.

[19]The rationale was itself debated: skeptics asked whether private returns to fabrication capacity were genuinely too low to attract finance, noting that leading incumbents had distributed tens of billions of dollars in dividends and share repurchases over the preceding decade; if there was a capital shortage, it was at least partly self-inflicted.

[20]Early figures included the $369 billion given for the energy and climate provisions in the Senate Democrats' summary (Senate Democratic Caucus, 2022) and a Goldman Sachs estimate of $1.2 trillion (Goldman Sachs, 2023). A more recent estimate by the Cato Institute puts the cost at $936 billion to $1.97 trillion (Fisher and Loucks, 2025).

[21]The IRA also expanded the Department of Energy Loan Programs Office (DoE LPO), appropriating about $11.7 billion in credit subsidy across its programs. Together with the 2021 infrastructure act, the IRA raised LPO's loan authority from about $40 billion to over $400 billion (Government Accountability Office, 2025).

[22]The §199A deduction's benefits accrue disproportionately to pass-through owners in sectors such as real estate and finance—as much an *anti*-industrial policy, in the sense of Section II.1, as an industrial one.

[23]The IRA-expanded DoE LPO authority was not repealed by legislation, but new originations were paused under the Trump administration.

[24]Tariff exclusions also create opportunities for favoritism: Fotak et al. (2025), for example, find that campaign contributions to the governing party increased the probability of receiving exclusions from tariffs on Chinese goods.

[25]For China the evidence is less favorable: Garcia-Macia, Kothari, and Tao (2025) estimate productivity losses of more than 1% from policy-induced misallocation, and Fang, Li, and Lu (2025) point to spatial inefficiency and overcapacity.

[26]The choice of measurement basis matters: for DoE LPO alone, measures differ by orders of magnitude. Loans closed in FY2024 were $2.0 billion (Table 3); conditional commitments made in the same year were $11.1 billion (Department of Energy, 2024); and total loan authority after the 2021 infrastructure act and the IRA is over $400 billion (Government Accountability Office, 2025). We report notional commitments in Table 3 for comparability with the OECD QuIS framework.

[27]Other notable support for US households, rather than industry, includes student lending.

[28]The EXIM episode of restricted lending complicates a pure concentrated-benefits account of durability. EXIM's principal beneficiaries (Boeing, GE, Caterpillar) were concentrated and politically organized, yet they could not prevent it. What distinguished this case was perhaps ideological framing: whereas bonus depreciation is "tax relief to support investment," EXIM was portrayed as "corporate welfare." Durability of fiscal industrial policy may require both concentrated beneficiaries and a protected ideological framing.

[29]These remedies impose duties; the distinction is from generally scheduled tariffs, not from all tariffs. Counts of cases do not measure the amount of protection or establish how far it offset tariff reductions. Ray (1981) finds that tariff and non-tariff protection were positively correlated across industries.

[30]Evidence from developing economies also highlights substantial local adjustment costs (Erten, Leight, and Tregenna, 2019).

[31]Export controls are themselves a long-standing instrument, from the Cold War-era CoCom regime through the Export Administration Act and its successors; the pandemic briefly added a public-health variant, with 2020 restrictions on exports of personal protective equipment. The 2022 rules extended the same instrument to advanced semiconductors and the equipment to produce them.

[32]Public Law 119-21, section 70531.

[33]The Global Trade Alert records announcements of every kind, each counted once whatever its size, so that a loan to a single firm weighs as much as the IRA; these counts cannot be set against the stock in Figure 8. Leaving out the firm-level pandemic relief of 2020–21 (some 1,400 entries), subsidies are 52% of the total, local-content provisions 23%, import tariffs 12%, and contingent-protection cases 7%. Its coverage is also incomplete: Ju, Li, and Wei (2026) use large language models to identify industrial policy provisions in Congressional legislation and Presidential Orders and find roughly 300% more instances of industrial policy than are catalogued by the Global Trade Alert database between 2008 and 2022.

[34]We do not suggest that subsidies and local content were absent before 2018. Our extract of the Global Trade Alert begins in that year, so we cannot compare the pace of new measures with earlier years.

[35]Sources also define grants, tax expenditures, and financial instruments differently. China publishes limited subsidy data; the CSIS estimate for 2019 is $248 billion at market exchange rates and $407 billion at purchasing power parity (DiPippo, Mazzocco, and Kennedy, 2022). DiPippo, Mazzocco, and Kennedy (2022) compare Chinese industrial policy spending with that of other large economies, including Brazil, France, Germany, Japan, South Korea, Taiwan, and the US. By their definition, US industrial policy is around 0.39% of GDP in 2019, lower than our estimates because of measurement and definitional differences. They place China as the largest spender at 1.73%, followed by South Korea at 0.67%, France at 0.55% and Japan at 0.50%.

[36]Unless a measure falls under a block exemption, national governments must notify it to the European Commission, which evaluates it against competition principles.

[37]European Commission State Aid Scoreboard can be accessed at `https://competition-policy.ec.europa.eu/state-aid/scoreboard/scoreboard-state-aid-data_en`. Accessed March 17, 2026.

[38]Made in China 2025 (MIC2025), announced in 2015, targets ten strategic sectors, including information technology, aerospace, advanced rail, new-energy vehicles, new materials, pharmaceuticals, agricultural machinery, maritime equipment, and high-end robotics, with explicit market share goals and extensive subsidy support.

[39]Support for failing firms is also only partly measured. When a supported US firm fails, it usually enters bankruptcy, as Solyndra did; the 2008–09 automaker rescues were exceptional. Chinese local governments and state-owned banks have often kept failing firms alive or arranged their absorption (Lam et al., 2017). Such support lowers the risk of entry and expansion and may contribute to excess capacity. Evidence on entry subsidies in shipbuilding documents fragmentation and idle capacity (Barwick, Kalouptsidi, and Zahur, 2025).

[40]On the question of effectiveness of US industrial policy, see Erten, Stiglitz, Verhoogen, and Wilse-Samson (2026) for a review.

APPENDIX

DATA SOURCES AND METHODOLOGY

Tax Expenditure Data

Sources: We construct provision-level tax expenditure estimates for 26 IRC provisions from FY1967 to FY2029. Our compilation contains no estimates for FY1962–66, although the investment credit (from 1962) and research expensing (from 1954) were already in force; on JCT's first estimates, for FY1967, they were 0.28 and 0.06% of GDP. Their omission understates the early series. The estimates come from two sources, in order of priority:

1. Joint Committee on Taxation (JCT) annual tax expenditure reports, 43 in all, from which values were extracted by hand (FY1967–2029, the last five years being JCT projections)

2. National Priorities Project (NPP) database of Treasury estimates (FY1974–2019), used where no JCT value is available

About 87% of the provision-year values are JCT's. Treasury's estimates supply the alcohol-fuels and rehabilitation credits (IRC 40 and 47) and fill gaps elsewhere, among them the R&D credit in eight years when it had lapsed or JCT reported no figure, some small energy credits before 2000, and equipment depreciation in FY1989. From each JCT report we take the first fiscal year it covers; fiscal years that open no report are filled with the projection in the latest earlier one. The estimates are therefore of mixed vintage.

Where a change in the law intervened, a projection describes a provision that no longer existed: this is the case for the general investment credit in FY1987–88 and arguably in FY1986. JCT's figures for FY1987 and FY1988 were published in March 1986, seven months before the Tax Reform Act, and assume that the credit continues; for those two years we use Treasury's estimates. JCT's FY1986 figure also predates the Act, which reached back to property placed in service after 1985. On Treasury's figure, the general incentives would be 0.9% of GDP in FY1986, not 1.2%. The FY1985 peak is not affected.

Negative estimates are set to zero. There are four, all outside the headline definitions: intangible drilling costs in FY1989, Section 179 expensing in FY2009, and bonus depreciation in FY2014 and FY2015, which JCT scored under a law about to lapse that Congress then extended. For FY2023 and FY2024 JCT reports the Section 48 energy credit only by technology, and we sum the lines with a stated amount, leaving out entries reported as under $50 million. Treasury's estimates are not always on the same footing as JCT's: for equipment depreciation in the late 1980s they are about 50% higher, so our FY1989 value, which is Treasury's, is correspondingly high.

All estimates use the "revenue loss" method, relative to a normative tax baseline. For expensing and depreciation, annual revenue losses differ from the present-value incentive to new investment. Provisions are classified into three tax tiers—*narrow* (core R&D incentives), *broad* (targeted energy, manufacturing, and domestic production incentives, plus the rehabilitation credit), and *general investment* (economy-wide capital subsidies including the ITC, accelerated depreciation, bonus depreciation, Section 179, and IRC 199A)—with a separate *supplementary* category for provisions tracked but excluded from all headline totals. The general investment tier is tracked separately from the headline broad definition; see the concordance table below.

Data cleaning: Two lines need care because JCT and Treasury report them under different names. JCT's section 48 line is the general investment credit through FY1993 and the energy

investment credit from FY1994, when the general credit had lapsed; we assign it to the general investment tier and to the broad tier accordingly, and drop the NPP lines that repeat it. From FY1979 to FY1993 JCT reports the energy credit on a separate line, which enters the broad tier; it was at most about $0.5 billion a year. Accelerated depreciation of equipment is taken from JCT in every year but FY1989; the NPP series for the same provision is not added to it. The same holds for the nonconventional fuels credit (IRC 29), which NPP lists as the "alternative fuel production credit." No JCT or Treasury report was published for FY1973; we interpolate values for five provisions (IRC 48, 174, 613, 263c, and ACRS/ADR) from reports JCS-20-73 and JCS-11-75.

Forward projections (FY2025–2029): Projections incorporate the One Big Beautiful Bill Act (OBBBA, signed July 4, 2025) using JCT cost estimates from JCX-45-25 (December 3, 2025). Key provisions: restoration of permanent 100% bonus depreciation (IRC 168k), restoration of domestic R&E expensing (IRC 174), permanent extension of Section 199A, and partial rollback of IRA clean energy credits. On net, related tax expenditures rise from approximately $99B (FY2028, pre-OBBBA baseline) to approximately $261B (post-OBBBA).

Pre-1980 estimates carry greater uncertainty due to fewer source reports and inconsistent provision definitions between JCT and Treasury.

On-Budget Spending Data

Source: Office of Management and Budget (OMB) Historical Tables

- Table 9.8: Outlays for the Conduct of R&D, FY1949–2024
- Table 3.2: Outlays by Function and Subfunction, FY1962–2024

From Table 9.8, we separate civilian R&D (total minus Department of Defense). The defense layer is Department of Defense RDT&E outlays, which we take from Table 3.2 because the Department's row in Table 9.8 changes definition in FY2017. Until FY2016 the two series were close: RDT&E outlays were between 94 and 101% of the Table 9.8 row, which also counts research paid for from other defense accounts. From FY2017 OMB stopped counting the late-stage development of major equipment as R&D, which took $24.5 billion out of that row in that year. From Table 3.2, we extract Energy (function 270) and General Science, Space, and Technology (function 250), which enter the Broad definition layer as on-budget spending beyond R&D. Table 9.8 classifies R&D outlays by budget function, so the R&D carried out within these two functions is already part of civilian R&D: its rows for NASA, the NSF, and atomic energy general science fall within function 250, and its energy row within function 270. We subtract those rows from the function totals and add only the remainder. In FY1966, for example, function 250 outlays were $6.7 billion, of which $5.8 billion was R&D. Function 270 is reported net of offsetting receipts from power marketing, uranium enrichment, and sales from the petroleum reserve, so its remainder is negative in 17 years.

Exclusions. Commerce (function 370) is excluded because it is dominated by crisis-era programs that are not industrial policy: TARP and PPP raised its outlays for other advancement of commerce to $170B in FY2009 and $608B in FY2020. This also excludes non-R&D CHIPS manufacturing grants recorded in function 370; CHIPS R&D and the semiconductor investment credit enter through the included research and tax series. Transportation (function 400) is tracked as supplementary but excluded from the four primary layers.

TABLE A.1: DEFINITION LAYER CONCORDANCE

Layer	Components
Narrow	Civilian R&D (OMB 9.8) + IRC 41 (R&D credit), IRC 174 (R&D expensing), IRC 45X (advanced manufacturing PTC), IRC 48D (semiconductor investment credit)
Broad	Narrow + outlays other than R&D in Energy (OMB 270) and Science/Space/Technology (OMB 250) + IRC 48 energy (energy ITC, post-1979 sectoral form; from FY1994 the whole of JCT's section 48 line), IRC 45/45Q/45V (energy production credits), IRC 48C (energy investment credit), IRC 30D (EV credit), IRC 29/45K (nonconventional fuels), IRC 199/250 (domestic production/FDII), IRC 40 (alcohol fuels credit) and IRC 47 (rehabilitation credit), FY1979–2019 from Treasury
+Defense	Broad + DoD RDT&E outlays (OMB 3.2)
+Defense+Finance	+Defense + DoE Loan Programs Office, Export-Import Bank, SBA 7(a)/504, USDA GSM-102/B&I
General Investment	IRC 48 (general investment tax credit, through FY1993), IRC 168/168k/ACRS (accelerated depreciation/bonus depreciation), IRC 179 (expensing), IRC 199A (qualified business income deduction). Tracked separately from headline definitions; see Section II.1 and Figure A.1
Supplementary	Transportation (OMB 400) + IRC 613 (percentage depletion), IRC 263(c) (intangible drilling costs), IRC 42 (LIHTC), IRC 45C (clinical testing)

Definition Concordance

Each layer is additive: +Defense includes everything in Broad, which includes everything in Narrow.

A note on §45X and §48D. The Narrow tier rests on the innovation-externality rationale (Griliches, 1992; Bloom, Schankerman, and Van Reenen, 2013); the Broad tier captures sectoral and supply-chain targeting. §45X (Advanced Manufacturing Production Credit) and §48D (Semiconductor Investment Credit) could also have been classified in Broad: their justification is supply-chain resilience and national security rather than knowledge spillovers. We retain them in Narrow because they sit alongside §41 and §174 in the tax-credit design of the CHIPS and IRA legislation, and treating them together keeps the post-2022 figures readable. Because the definitions are nested, reclassifying §45X and §48D would lower Narrow by about 0.06 percentage points of GDP in FY2024 ($16.8 billion) and leave Broad and every wider total unchanged.

Federal Credit Programs

We track energy, export, agricultural, and general small-business credit through four agencies:

- **Department of Energy (DoE) Loan Programs Office (LPO):** Title XVII (Sections 1703/1705) innovative energy loans and Advanced Technology Vehicles Manufacturing (ATVM) loans. Each loan or guarantee enters once, in the fiscal year of financial closing. Guarantees closed by September 2011 use the federally covered amounts and closing dates in GAO's inventory of the program (Government Accountability Office, 2012), which for partial guarantees are smaller than the loans announced; other entries use the amounts DOE announced

at closing, checked against its project pages and Government Accountability Office (2025). Conditional commitments are offers, not loans, and are left out until they close. Coverage: FY2009–2024.

- **Export-Import Bank (EXIM):** Export credit guarantees, direct loans, and export-credit insurance from Annual Management Reports and Congressional Budget Justifications. Coverage: FY1996–2024.
- **Small Business Administration (SBA):** 7(a) and 504 loan programs. Federal exposure is the SBA-guaranteed amount of approved 7(a) loans, as the SBA reports it, plus approved 504 debentures, which the SBA guarantees in full. Gross 7(a) approvals, which include the lenders' unguaranteed share, were $31.1 billion in FY2024, of which $22.7 billion was guaranteed. Coverage: FY1991–2024. PPP is excluded.
- **US Department of Agriculture (USDA):** Foreign Agricultural Service GSM-102 export credit guarantees and Rural Development Business & Industry guaranteed loans, from OMB's Federal Credit Supplement, which reports for each annual cohort of guarantees the loans disbursed to date. We use this as a proxy for the year's guaranteed lending; it is not a series of annual commitments. For FY2023 and FY2024, whose cohorts are incomplete, both series use the guaranteed amount of new commitments reported in the Budget Appendix. Coverage: GSM-102 from FY1992, B&I from FY1995.

Measurement: We report notional amounts (face value of loans and guarantees), consistent with the OECD QuIS methodology (Criscuolo, Lalanne, and Díaz, 2022). This differs from the subsidy cost approach used in federal credit budgeting under FCRA, which estimates the net present value of expected government losses. Notional amounts are appropriate for measuring the scale of government involvement in credit markets and for cross-country comparison; they overstate fiscal cost relative to subsidy-cost measures.

Exclusions: Development Finance Corporation ($12.1B in FY2024; primarily international development), MARAD Title XI (∼$1.3B; immaterial), HUD Section 108 (urban development), and Treasury CDFI Fund (community development).

International Comparison Sources

- **European Union:** European Commission State Aid Scoreboard
- **China:** DiPippo, Mazzocco, and Kennedy (2022) (CSIS "Red Ink" report)
- **OECD:** Quantifying Industrial Strategies (QuIS) project (Criscuolo, Lalanne, and Díaz, 2022)

Definitional differences limit direct cross-country comparison. US figures capture federal outlays, tax expenditures, and the face value of credit commitments; the EU State Aid Scoreboard captures aid reported under the state-aid rules, block-exempted as well as notified; Chinese figures aggregate programs with varying transparency. The OECD QuIS project (covering 11 OECD countries) provides the most consistent cross-country framework.

Normalization and Projections

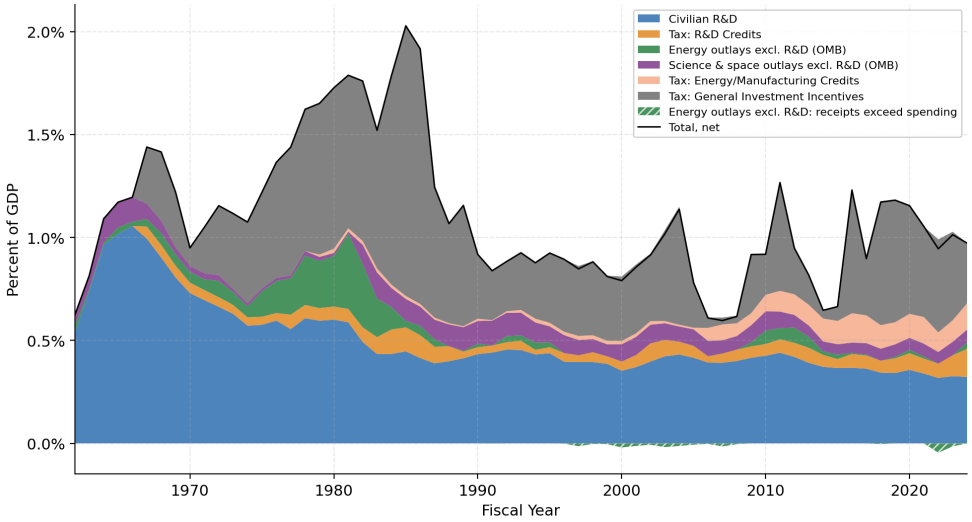
Nominal GDP and the GDP deflator are from FRED (quarterly series), averaged over each fiscal year: October to September from FY1977, and July to June through FY1976, when the federal fiscal

year began in July. The transition quarter, July to September 1976, belongs to no fiscal year and is left out, as it is from the outlay series. On this basis our fiscal-year GDP matches OMB's Historical Table 10.1 to within 0.01% in those years. All real values are expressed in FY2024 dollars. Shares of GDP are computed as nominal spending divided by nominal GDP. GDP projections for FY2025–2029 use the CBO January 2025 baseline (∼4.5% nominal growth per year).

Broad Definition Including General Investment Incentives

As discussed in Section II.1, our headline broad definition excludes general investment incentives (the Investment Tax Credit, accelerated depreciation, bonus depreciation, Section 179 expensing, and the qualified business income deduction). Figure A.1 shows the composition of the broad definition when these instruments are included. Including general investment incentives raises the FY2024 broad measure from 0.68% to approximately 0.97% of GDP. The largest effect is in the 1980s, when the ITC and ACRS together reached about 1.3% of GDP (FY1985) and the inclusive measure about 2%, before falling back after the Tax Reform Act of 1986. JCT's figures for FY1986–88 were projected before that Act; see "Tax Expenditure Data" above.

FIGURE A.1: INDUSTRIAL POLICY (BROAD INCLUDING GENERAL INVESTMENT INCENTIVES) AS SHARE OF GDP, 1962–2024



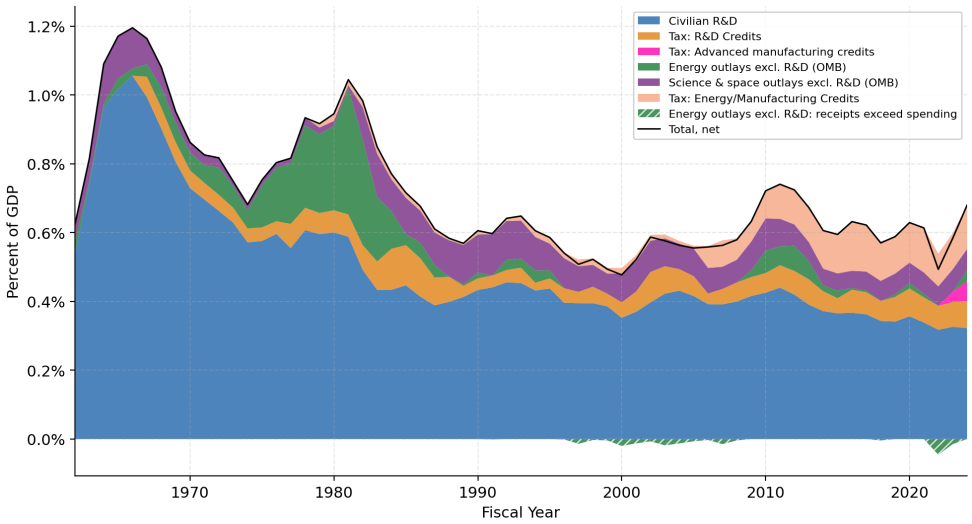
Notes: Figure shows the compositional breakdown of the broad industrial policy definition *including* general investment incentives (ITC, accelerated depreciation, bonus depreciation, Section 179, IRC 199A). Compare to Figure 4, which shows the headline broad definition excluding these instruments. Tax expenditures are measured from FY1967; the general incentives are therefore missing, not absent, in FY1962–66. Data are the nominal value of the industrial policy item over nominal GDP in a given year.

Alt text: Stacked area chart decomposing US broad-definition industrial policy *including* general investment incentives as a share of GDP, 1962–2024. It adds a band for general investment incentives (the investment tax credit, accelerated and bonus depreciation, Section 179 expensing, and the §199A deduction) to the bands shown in the headline broad figure. That band lifts the total to a peak near 2.0% of GDP in fiscal 1985; it shrinks after the Tax Reform Act of 1986 and widens again after 2016; the inclusive total is about 0.97% in 2024.

Decomposition of the Narrow Tax Band: §41/§174 versus §45X/§48D

Figure A.2 splits the Narrow tax band of Figure 4 into §41/§174 and §45X/§48D, whose classification is discussed in Section II.1 and the note above. Most of the post-2022 increase in the Narrow tax band comes from §45X and §48D.

FIGURE A.2: COMPOSITION OF BROAD INDUSTRIAL POLICY WITH NARROW TAX BAND DECOMPOSED, 1962–2024



Notes: Same Broad-definition composition as Figure 4, with the "Tax: R&D credits" band split into "Tax: R&D credits (§41, §174)" and "Tax: Advanced manufacturing credits (§45X, §48D)." Most of the post-2022 increase in the Narrow tax band is driven by §45X and §48D, which were created or expanded by the CHIPS and Science Act and the Inflation Reduction Act in August 2022.

Alt text: Stacked area chart replicating the broad-definition composition, 1962–2024, but splitting the narrow R&D tax-credit band into two parts: the §41 and §174 R&D credits, and the §45X and §48D advanced-manufacturing and semiconductor credits. The figure shows that most of the post-2022 increase in the narrow tax band comes from the §45X and §48D credits created by the CHIPS Act and the Inflation Reduction Act.

Sectoral Incidence of §168(k) Bonus Depreciation, 2018–2022

Table A.2 shows that bonus depreciation is horizontal in law but concentrated in practice: about 31% of the amounts claimed went to manufacturing and information together, and another 15% to real estate. Oil and gas are a relatively small share of the total. The provision was made permanent at 100% by OBBBA in July 2025, scored by JCT at approximately $363 billion over the FY2025–2034 window. We track §168(k) separately from our headline definitions, with the other general investment incentives (Section II.1). Table A.2 shows where deductions were claimed, not the distribution of revenue losses or ultimate economic benefits.

TABLE A.2: SECTORAL ALLOCATION OF §168(K) BONUS DEPRECIATION CLAIMED (CUMULATIVE 2018–2022)

Sector	$ billion	Share of total
Cumulative, tax years 2018–2022		
Manufacturing (NAICS 31–33)	965.7	20.3%
Real estate & rental/leasing (53)	723.0	15.2%
Wholesale & retail trade (42, 44–45)	692.5	14.5%
Information (51)	513.6	10.8%
Transportation & warehousing (48–49)	361.6	7.6%
Finance and insurance (52)	205.7	4.3%
Mining incl. oil and gas (21)	181.5	3.8%
Construction (23)	169.6	3.6%
Utilities (22)	149.3	3.1%
All sectors	4,766.1	100.0%
Memo: groupings requested from JCT, tax year 2022 only		
Technology (semiconductors, software, computer manufacturing, data centers, telecom)	152.3	13.1%
Oil and gas	30.1	2.6%
Defense (large firms with defense contracts)	17.6	1.5%
Pharmaceutical	9.9	0.8%

Source: Joint Committee on Taxation (2025), letter to Senator Elizabeth Warren, October 28, 2025: Table 3 for the top panel and Table 5 (all business entities) for the memo panel. Amounts are bonus-depreciation deductions claimed, not revenue cost, by all entity types (C corporations, S corporations, partnerships, and sole proprietorships); C corporations account for $2,698.6 billion of the $4,766.1 billion total. The nine sectors shown account for 83% of the total. Memo shares are of the 2022 total. Claims in the Information sector rose from approximately $82 billion in 2018 to $136 billion in 2022. Since the Tax Cuts and Jobs Act of 2017, property used in rate-regulated utility businesses has not been eligible for bonus depreciation; the utilities claims shown presumably reflect unregulated activities and property acquired before the change.