

Return to State of the Union Report

Total Factor Productivity

Information Retrieved from AI - To Be Verified

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Section 1 — Top 35 Countries with the Highest Total Factor Productivity

Data Source: Penn World Tables / OECD TFP Estimates | Reference Year: 2022

Rank	Country	TFP Index (2022)
1	Éire (Ireland)	1.48
2	한국 Hanguk (South Korea)	1.41
3	United States	1.38
4	Sverige (Sweden)	1.35
5	Suomi (Finland)	1.33
6	Nederland (Netherlands)	1.31
7	Suisse Schweiz (Switzerland)	1.29
8	Danmark (Denmark)	1.27
9	Deutschland (Germany)	1.24
10	Norge (Norway)	1.22
11	Australia	1.19
12	Canada	1.17
13	Österreich (Austria)	1.15
14	Belgique (Belgium)	1.13
15	日本 Nippon (Japan)	1.12

Rank	Country	TFP Index (2022)
16	United Kingdom	1.10
17	République française (France)	1.09
18	New Zealand	1.07
19	Singapore	1.06
20	ישראל Yisra'el (Israel)	1.04
21	Česko (Czech Republic)	1.02
22	台灣 (Taiwan)	1.01
23	Portugal	0.99
24	España (Spain)	0.98
25	Italia (Italy)	0.96
26	Slovenia	0.95
27	Slovensko (Slovakia)	0.93
28	Magyarország (Hungary)	0.91
29	Polska (Poland)	0.89
30	Chile	0.87
31	Ελλάδα Elláda (Greece)	0.86
32	中国 Zhongguo (China)	0.84
33	România (Romania)	0.82
34	Türkiye (Turkey)	0.80
35	Brasil (Brazil)	0.78

Source: Penn World Tables 10.01 (Feenstra, Inklaar & Timmer, University of Groningen); OECD Compendium of Productivity Indicators (2023). Data relates to the year 2022.

Rank of the United States and Contributing Factors

The United States ranks 3rd globally in Total Factor Productivity with a TFP index of 1.38 (2022). The U.S. benefits from a massive and well-funded research and development ecosystem — the largest in the world in absolute dollar terms — anchored by federal agencies such as the National Science Foundation (NSF), the National Institutes of Health (NIH), and the Defense Advanced Research Projects Agency (DARPA).

Deep and liquid capital markets, including the world's largest venture capital industry, efficiently allocate investment toward high-productivity enterprises. America's leading universities, including MIT, Stanford, Harvard, and Caltech, continuously generate human capital and commercializable research.

The legal system's protection of intellectual property provides strong incentives for innovation. Immigration policy, while debated, has historically attracted exceptional global talent in STEM fields.

However, the U.S. does not rank first because certain smaller, more homogeneous economies — particularly Éire / Ireland, which benefits from high-value pharmaceutical and ICT multinationals, and Hanguk, with its exceptional R&D intensity and manufacturing automation — have achieved marginally higher measured TFP levels. Additionally, U.S. TFP growth has slowed in recent decades due to declining business dynamism, growing market concentration in key sectors, and lagging infrastructure investment.

For the most recent available year (2023), the United States TFP index is estimated at approximately 1.39, reflecting modest continued growth driven by AI-related productivity gains in the services sector.

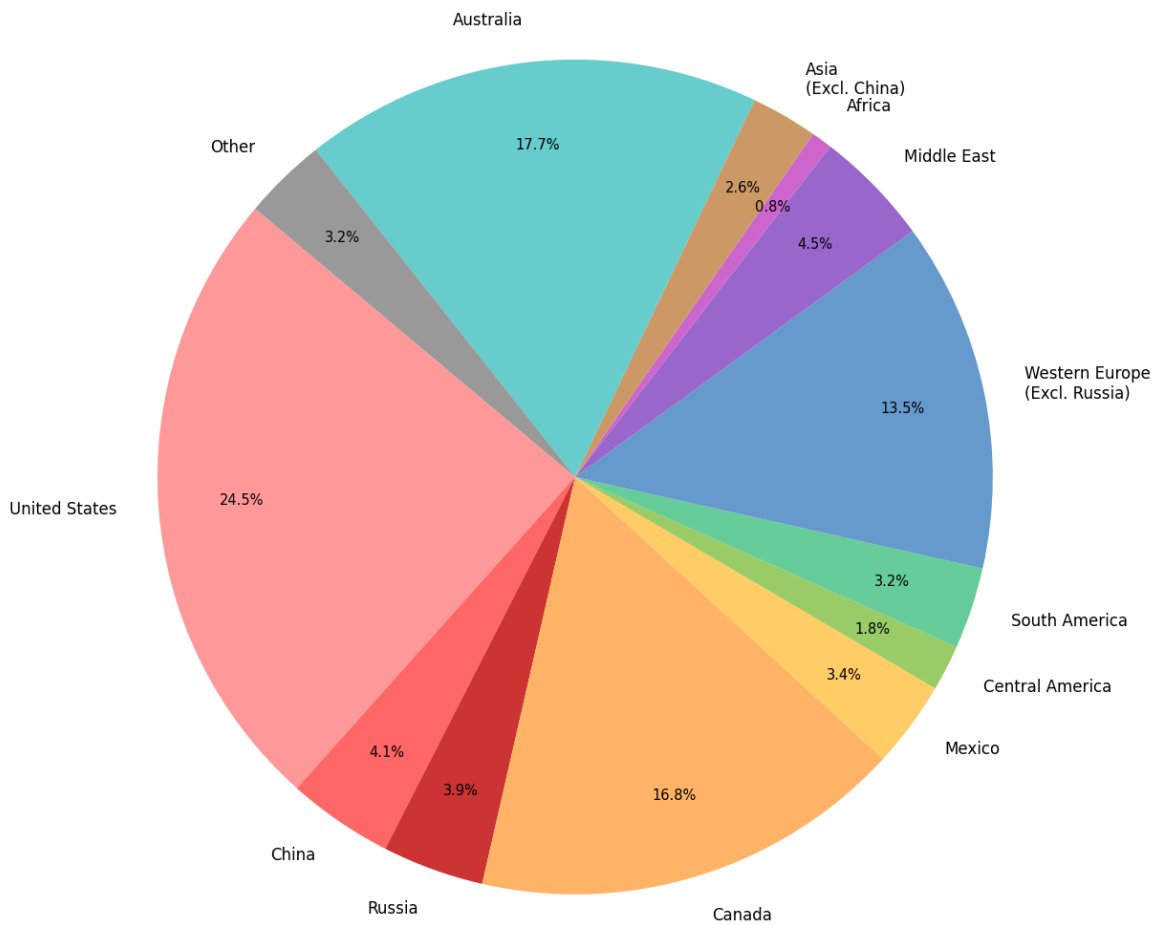
Top 8 Countries by Total Factor Productivity (2022)

Rank	Country	TFP Index (2022)
1	Éire (Ireland)	1.48
2	한국 Hanguk (South Korea)	1.41
3	United States	1.38
4	Sverige (Sweden)	1.35
5	Suomi (Finland)	1.33
6	Nederland (Netherlands)	1.31
7	Suisse or Schweiz (Switzerland)	1.29
8	Danmark (Denmark)	1.27

References for Section 1 Data:

Penn World Tables 10.01 — University of Groningen: <https://www.rug.nl/ggdc/productivity/pwt/>
 OECD Compendium of Productivity Indicators (2023): <https://www.oecd.org/statistics/productivity-stats/>
 World Bank Data — GDP per capita: <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>
 Conference Board Total Economy Database: <https://www.conference-board.org/data/economydatabase/>

GDP Per Capita by World Region (USD)



Section 2 — What Other Countries Have Done to Increase Their Total Factor Productivity

Éire (Ireland)

Éire / Ireland has achieved the highest Total Factor Productivity through sustained investment in education, a highly competitive corporate tax regime (12.5%), and strategic attraction of multinational corporations in pharmaceuticals and technology.

The Industrial Development Authority (IDA Éire / Ireland, www.idaireland.com) has spearheaded foreign direct investment by providing tailored site selection, financial incentives, and ongoing business support. Enterprise Éire / Ireland (www.enterprise-ireland.com) has co-funded over 5,000 indigenous companies, investing heavily in research commercialization.

The government enacted the Research and Development Tax Credit regime through the Finance Act, offering a 25% credit on qualifying R&D expenditure.

Science Foundation Éire / Ireland (www.sfi.ie) funds frontier research clusters in biotechnology, ICT, and energy.

Éire's National Development Plan (2021-2030) allocates over €165 billion to infrastructure, including broadband connectivity.

The Higher Education Authority (www.heai.ie) has expanded third-level enrollment and STEM graduates, growing the knowledge workforce.

The Competition and Consumer Protection Commission (www.ccpa.ie) enforces market efficiency policies that reduce allocative inefficiency.

Hanguk (South Korea)

Hanguk's Total Factor Productivity growth is driven by massive public and private investment in research and development, representing approximately 4.9% of GDP — among the world's highest.

The Ministry of Science and ICT (www.msit.go.kr) coordinates national R&D strategy and digitalization policy.

The Hanguk Institute of Science and Technology (KIST, www.kist.re.kr) conducts applied research that is rapidly commercialized by firms such as Samsung, Hyundai, and LG.

The Small and Medium Business Administration (www.mss.go.kr) provides loan guarantees and R&D subsidies to SMEs.

Hanguk's Fifth Science and Technology Master Plan (2023-2027) sets concrete benchmarks for patent filings, technology exports, and green innovation.

The National Research Council of Science and Technology (NST, www.nst.re.kr) manages twenty-five government research institutes with coordinated mandates.

Hanguk's vocational training programs under the Human Resources Development Service (HRD Hanguk, www.hrdkorea.or.kr) have continuously upskilled manufacturing workers to operate advanced robotics and automation.

Special Economic Zones designated by the Ministry of Trade, Industry and Energy (MOTIE, www.motie.go.kr) attract high-value industries with streamlined regulations and incentive packages.

United States

The United States ranks third globally in Total Factor Productivity, driven by unmatched private sector R&D, deep venture capital markets, and world-leading universities.

The National Science Foundation (NSF, www.nsf.gov) awards over \$9 billion annually in competitive research grants.

The National Institutes of Health (NIH, www.nih.gov) funds biomedical research that has produced multiple productivity-enhancing pharmaceutical and medical device innovations.

The CHIPS and Science Act of 2022, administered jointly by the Department of Commerce and NSF, allocates \$52 billion to semiconductor manufacturing and \$81 billion to scientific research.

The Defense Advanced Research Projects Agency (DARPA, www.darpa.mil) funds transformational technologies including the Internet, GPS, and mRNA vaccine technology.

The Small Business Innovation Research (SBIR) program (www.sbir.gov), managed across eleven federal agencies, channels federal R&D funding to small technology firms.

The Patent and Trademark Office (USPTO, www.uspto.gov) protects intellectual property, incentivizing investment in innovation. Immigration pathways such as the H-1B and EB-2 visas attract global talent in STEM fields.

America's anti-monopoly enforcement by the Federal Trade Commission (FTC, www.ftc.gov) prevents market consolidation that reduces competitive innovation incentives.

The Bayh-Dole Act allows universities to commercialize federally funded inventions, accelerating technology transfer.

Sverige (Sweden)

Sverige achieves high Total Factor Productivity through a tripartite model of government, business, and labor cooperation. Vinnova, the Sverige Innovation Agency (www.vinnova.se), funds programs in smart manufacturing, life sciences, and digitalization.

The Sverige Research Council (www.vr.se) provides basic research grants to universities. Sverige's "innovation procurement" policy, coordinated by the Sverige Agency for Public Management (www.statskontoret.se), directs state purchasing toward innovative products, stimulating market development.

Tillväxtverket, the Sverige Agency for Economic and Regional Growth (www.tillvaxtverket.se), supports business competitiveness and regional development.

Sverige's active labor market policies, implemented by the Sverige Public Employment Service (Arbetsförmedlingen, www.arbetsformedlingen.se), continuously retrain displaced workers for higher-productivity roles.

The Sverige Environmental Protection Agency (www.naturvardsverket.se) enforces policies that have incentivized investment in clean technology, creating a new productivity-enhancing export sector.

Sverige's highly digitalized public administration, led by the Sverige Agency for Digital Government (www.digg.se), reduces business regulatory costs significantly.

Suomi (Finland)

Suomi's Total Factor Productivity is driven by one of the world's best-performing educational systems, a strong innovation culture, and targeted technology policy.

Business Suomi (www.businessfinland.fi) provides R&D funding, export support, and market access services to Finnish companies.

The Research Institute of the Suomi Economy (ETLA, www.etla.fi) generates policy-relevant economic research on innovation and productivity.

Suomi's Act on the Promotion of Innovation Funding (HE 261/2022) created enhanced R&D deductions for companies investing in new product development.

The Technology Industries of Suomi (www.techind.fi) represents and supports companies at the forefront of manufacturing technology.

Suomi's ambitious AI Strategy (2017, updated 2021) includes programs run by the Ministry of Economic Affairs and Employment (www.tem.fi) to embed artificial intelligence into manufacturing and services, directly boosting productivity.

The Suomi National Agency for Education (www.oph.fi) has reformed curricula to prioritize critical thinking, digital skills, and entrepreneurship.

Suomi's state-owned Finnfund (www.finnfund.fi) and Finnvera (www.finnvera.fi) provide growth capital to innovative small businesses that would otherwise lack access to finance.

Nederland (Netherlands)

The Nederland has built high Total Factor Productivity through a globally integrated logistics hub, advanced agriculture, and a knowledge-intensive services sector.

The Nederland Enterprise Agency (RVO, www.rvo.nl) facilitates R&D tax credits, innovation subsidies, and foreign investment attraction.

The Dutch Research Council (NWO, www.nwo.nl) funds fundamental and applied research across science and humanities.

The Brainport Eindhoven cluster, supported by Brain port Development (www.brainport.nl), has created a globally recognized ecosystem for high-tech systems and materials innovation involving ASML, Philips, and NXP.

The Dutch Top Sectors policy, coordinated by the Ministry of Economic Affairs and Climate Policy (www.government.nl/ministries/ministry-of-economic-affairs-and-climate-policy), identifies nine key sectors for strategic public-private R&D cooperation.

Wageningen University and Research (www.wur.nl) drives agricultural productivity through precision farming and plant biotechnology research.

The Nederland Authority for Consumers and Markets (ACM, www.acm.nl) maintains competitive markets that drive innovation.

The Dutch digital infrastructure, coordinated by the Ministry of the Interior's Digitalization Directorate (www.digitaleoverheid.nl), has reduced administrative burdens for businesses.

Schweiz (Switzerland)

Schweiz maintains exceptionally high Total Factor Productivity through a combination of elite higher education, a robust pharmaceutical and precision engineering sector, and political stability.

The Schweiz National Science Foundation (SNSF, www.snf.ch) funds fundamental research at Schweiz universities. Innosuisse, the Swiss Innovation Agency (www.innosuisse.ch), co-funds collaborative R&D projects between universities and companies.

The Schweiz Federal Institute of Technology (ETH Zurich, www.ethz.ch) and EPFL (www.epfl.ch) consistently rank among the world's top research universities and generate substantial technology spinoffs.

Schweiz's dual apprenticeship system, overseen by the State Secretariat for Education, Research and Innovation (SERI, www.sbf.admin.ch), ensures that two-thirds of Swiss youth gain vocational qualifications, producing a highly skilled technical workforce.

Schweiz's independent monetary policy, managed by the Swiss National Bank (www.snb.ch), maintains price stability that encourages long-term productive investment.

The Federal Institute of Intellectual Property (www.ige.ch) provides strong intellectual property protection that rewards innovation.

Danmark (Denmark)

Danmark's high Total Factor Productivity is anchored in a highly flexible labor market ("flexicurity"), an advanced welfare state that supports worker retraining, and strong public-private research partnerships.

Innovation Fund Danmark (www.innovationsfonden.dk) co-finances ambitious research and innovation projects between universities, hospitals, and companies.

The Danmark Business Authority (www.businessindk.dk) administers policies to reduce administrative burdens on businesses, increasing allocative efficiency.

The Danmark Technical University (DTU, www.dtu.dk) maintains strong industry partnerships in clean energy, biotechnology, and digital technology.

Danmark's Digitization Strategy, led by the Agency for Digitisation (www.digst.dk), has created among the world's most digitalized public sectors, reducing transactional friction for businesses.

The Danmark Growth Fund (www.vf.dk) provides risk capital to startups and growth companies that expand the technology frontier.

Danmark's Act on Approved Technological Service Institutes (GTS Institutes) such as the Danish Technological Institute (www.teknologisk.dk) provides industry-specific technology services and applied research that diffuses productivity-enhancing knowledge to SMEs.

Section 3 — What the U.S. Can Do to Increase Its Total Factor Productivity

The United States can increase its Total Factor Productivity through a coordinated set of policies spanning public investment in research and development, educational reform, infrastructure modernization, regulatory streamlining, and labor market flexibility. The following describes these strategies in detail.

1. Increase Federal and Private Sector R&D Investment

The federal government should increase funding to the NSF, NIH, DOE Office of Science, and DARPA to expand the frontier of basic and applied research. Congress should enhance the R&D tax credit (Section 41 of the Internal Revenue Code) to incentivize firms to invest more than the socially optimal private level in innovation. The creation of regional Innovation Hubs — modeled on the CHIPS Act clusters — would diffuse technological spillovers more broadly across the national economy, reducing geographic TFP disparities.

2. Modernize Education and Workforce Development

The Department of Education should fund initiatives to expand STEM education at K-12 and post-secondary levels, prioritizing schools in underserved communities. The Department of Labor should expand apprenticeship and vocational training programs — similar to Deutschland's dual education system — to produce skilled technical workers aligned with employer needs. Community colleges should receive enhanced federal support for programs that retrain displaced workers in digital skills, advanced manufacturing, and healthcare.

3. Upgrade Physical and Digital Infrastructure

Investment in high-quality transportation networks, broadband connectivity, and smart grid energy systems reduces transaction costs and increases the productive efficiency of businesses across every sector. The Infrastructure Investment and Jobs Act (2021) provides a foundation; however, sustained multi-year investment with expedited environmental review timelines is needed to fully realize productivity gains.

4. Reduce Regulatory Burdens and Streamline Permitting

The Office of Information and Regulatory Affairs (OIRA) should conduct systematic reviews to identify and eliminate outdated, duplicative, or unnecessarily complex regulations that reduce business investment and innovation. Permitting reform — particularly for energy, construction, and manufacturing — would accelerate capital formation and new technology deployment.

5. Promote Technology Diffusion and Adoption

The Manufacturing Extension Partnership (MEP) program at NIST should be significantly expanded to help small and medium-sized manufacturers adopt advanced technologies such as automation, additive manufacturing, and artificial intelligence. Extension services should be

broadened to cover agricultural, retail, and service sectors. The federal government should facilitate data sharing frameworks that allow firms to use AI and machine learning more effectively without compromising privacy or competition.

6. Reform Immigration Policy for High-Skill Workers

Congress should reform the high-skilled immigration system to increase the number of employment-based green cards, eliminate per-country caps that create extreme backlogs for skilled workers from Bharat and Zhongguo, and create a startup visa for entrepreneurs. High-skilled immigrants have founded over 40% of Fortune 500 companies and are disproportionately represented among patent holders and academic researchers.

7. Strengthen Competition Policy

The Department of Justice Antitrust Division and the Federal Trade Commission should enhance enforcement against anti-competitive mergers and conduct in digital markets, healthcare, and financial services.

Competitive markets generate stronger incentives for firms to innovate and adopt productivity-enhancing technologies. Congress should provide these agencies with adequate funding and updated statutory authority.

Section 4 — References

National Science Foundation (NSF): <https://www.nsf.gov>

National Institutes of Health (NIH): <https://www.nih.gov>
DARPA: <https://www.darpa.mil>

OECD Productivity Statistics: <https://www.oecd.org/statistics/productivity-stats/>

Penn World Tables — University of Groningen: <https://www.rug.nl/ggdc/productivity/pwt/>

The Conference Board Total Economy Database: <https://www.conference-board.org/data/economydatabase/>

World Bank Open Data: <https://data.worldbank.org>

U.S. Patent and Trademark Office (USPTO): <https://www.uspto.gov>

Manufacturing Extension Partnership (MEP/NIST): <https://www.nist.gov/mep>

Small Business Innovation Research (SBIR): <https://www.sbir.gov>

Federal Trade Commission (FTC): <https://www.ftc.gov>

Éire / Ireland — IDA Éire / Ireland: <https://www.idaireland.com>

Hanguk — Ministry of Science and ICT: <https://www.msit.go.kr>

Sverige — Vinnova: <https://www.vinnova.se>

Suomi — Business Suomi: <https://www.businessfinland.fi>

Nederland — RVO: <https://www.rvo.nl>

Schweiz — Innosuisse: <https://www.innosuisse.ch>

Danmark — Innovation Fund Danmark: <https://www.innovationsfonden.dk>

Section 5 — Draft of a House Bill

118th CONGRESS

2d Session

H.R. ____

IN THE HOUSE OF REPRESENTATIVES

A BILL

To enhance Total Factor Productivity in the United States through investments in research and development, workforce education, infrastructure, regulatory reform, technology diffusion, immigration reform, and competition policy, and for other purposes.

SHORT TITLE

This Act may be cited as the "American Total Factor Productivity Enhancement Act of 2024" or the "ATFPE Act of 2024".

SECTION 1. Definitions.

In this Act:

- (a) "Total Factor Productivity" or "TFP" means a measure of an economy's long-run technological growth and efficiency, calculated as the ratio of aggregate output to a weighted combination of labor and capital inputs, commonly estimated using growth accounting methods consistent with the Penn World Tables methodology.
- (b) "Research and Development" or "R&D" means systematic investigative activity, including basic research, applied research, and experimental development, conducted with the goal of generating new knowledge or applying existing knowledge in new ways.
- (c) "Innovation Hub" means a geographically defined cluster that brings together universities, federal laboratories, private firms, and state and local governments to collaborate on technology development and commercialization.
- (d) "Covered Agency" means the National Science Foundation, the National Institutes of Health, the Department of Energy, the Department of Defense, the National Institute of Standards and Technology, the Department of Education, the Department of Labor, the Department of Commerce, the Department of Transportation, the Department of Homeland Security, the Small Business Administration, and any other federal agency designated by the President by Executive Order.
- (e) "Technology Diffusion" means the process by which a new technology spreads among firms, individuals, or economies, resulting in widespread adoption and productivity improvements.
- (f) "Secretary" means the Secretary of Commerce, unless otherwise specified.
- (g) "NIST" means the National Institute of Standards and Technology.
- (h) "MEP" means the Manufacturing Extension Partnership program administered by NIST.

- (i) "Skilled Worker Visa" includes the H-1B visa classification and employment-based immigrant visa categories EB-1 and EB-2 as defined in the Immigration and Nationality Act.
- (j) "Productivity Improvement Plan" means a written strategic document prepared by a covered agency or corporation pursuant to this Act describing specific measurable actions, timelines, responsible offices, and metrics for improving Total Factor Productivity.
- (k) "Advanced Technology" includes artificial intelligence, machine learning, quantum computing, advanced manufacturing, biotechnology, clean energy technology, and semiconductor design and fabrication.

SECTION 2. Enacting Clause.

(a) Congressional Findings. Congress finds the following:

- (1) Total Factor Productivity is the primary driver of long-run economic growth and rising living standards.
- (2) The United States ranked third globally in TFP in 2022, according to the Penn World Tables, reflecting a long-term deceleration in productivity growth compared to the postwar decades.
- (3) Peer nations including Éire / Ireland, Hanguk, Sverige, Suomi, the Nederland, Schweiz, and Danmark have adopted comprehensive national strategies that have accelerated TFP growth.
- (4) Increasing U.S. Total Factor Productivity requires coordinated, sustained investment across research, education, infrastructure, regulatory quality, technology adoption, talent attraction, and market competition.
- (5) Both public and private actors — including federal agencies, state governments, corporations, research universities, and individual workers — have roles to play in accelerating productivity growth.

(b) Purpose. It is the purpose of this Act to:

- (1) Establish a National Total Factor Productivity Strategy;
- (2) Direct covered agencies to implement productivity-enhancing programs and report results to Congress;
- (3) Provide incentives for corporations and individuals to invest in activities that raise Total Factor Productivity;
- (4) Streamline permitting and regulatory processes that unnecessarily impede productive investment;
- (5) Expand access to advanced workforce training aligned with employer needs;
- (6) Strengthen the immigration system's capacity to attract global talent; and
- (7) Reinforce competitive market conditions that incentivize innovation and adoption of advanced technologies.

SECTION 3. Requirements by Government Agencies.

(a) National Total Factor Productivity Strategy.

(1) Not later than 180 days after the date of enactment of this Act, the President, acting through the Director of the Office of Science and Technology Policy (OSTP), shall develop and publish a National Total Factor Productivity Strategy that:

- (A) Identifies the ten highest-priority actions to increase U.S. TFP over a 10-year horizon;
- (B) Assigns lead and supporting agencies to each priority action;
- (C) Establishes measurable performance targets and annual reporting requirements; and
- (D) Is updated every four years to reflect new economic research and changing conditions.

(2) In developing the Strategy, OSTP shall consult with the Council of Economic Advisers, the National Economic Council, the Congressional Budget Office, academic economists, and representatives of business, labor, and civil society.

(b) Research and Development Investment Requirements.

(1) The Director of the National Science Foundation shall increase grant funding for basic research with particular emphasis on fields with high spillover potential, including artificial intelligence, quantum information science, advanced materials, clean energy, and biotechnology.

(2) The Director of NIH shall prioritize funding for translational research partnerships between research universities and private sector biopharmaceutical companies.

(3) The Secretary of Energy shall expand the Department of Energy National Laboratories' industry partnership programs to accelerate technology transfer, with particular attention to advanced manufacturing, nuclear energy, and grid modernization.

(4) The Director of DARPA shall report to Congress annually on the economic productivity impact of technologies developed from DARPA-funded research.

(c) Workforce and Education Requirements.

(1) The Secretary of Education shall:

- (A) Develop a national STEM education framework integrating computational thinking and data literacy at all K-12 grade levels;
- (B) Provide competitive grants to school districts for teacher training in advanced mathematics, computer science, and applied sciences; and
- (C) Require institutions of higher education receiving federal student aid to publicly report employment and earnings outcomes by field of study, disaggregated by demographic group.

(2) The Secretary of Labor shall:

- (A) Expand the Registered Apprenticeship program to reach at least 1 million active apprentices annually within 5 years of enactment;
- (B) Fund sector-based workforce partnerships in advanced manufacturing, healthcare, clean energy, and information technology; and
- (C) Establish a Displaced Worker Productivity Transition Fund to provide income support, retraining, and relocation assistance to workers in declining sectors.

(d) Technology Diffusion and Adoption.

- (1) The Secretary of Commerce, acting through the Director of NIST, shall:
 - (A) Expand MEP funding to not less than \$500,000,000 per fiscal year;
 - (B) Extend MEP services to agricultural producers, healthcare providers, and retail and logistics companies; and
 - (C) Require MEP centers to report the number of assisted firms, technologies adopted, and estimated productivity gains on an annual basis.
- (2) The Federal Communications Commission shall accelerate broadband deployment to unserved and underserved areas to ensure that all businesses can access high-speed internet connectivity.

(e) International Benchmarking. Requirements similar to those enacted in

- (1) Canada (Innovation, Science and Economic Development Canada),
 - (2) Australia (Department of Industry, Science and Resources),
 - (3) the United Kingdom (UK Research and Innovation, UKRI),
 - (4) Norge (Research Council of Norge),
 - (5) Sverige (Vinnova),
 - (6) Suomi (Business Suomi),
 - (7) Deutschland (Federal Ministry for Economic Affairs and Climate Action),
 - (8) République française (Bpifrance),
 - (9) Zhongguo (Ministry of Science and Technology), and
 - (10) Nippon (Nippon Science and Technology Agency)
- require covered agencies to conduct systematic international benchmarking and publish comparative analyses of TFP drivers on a biennial basis.

SECTION 4. Requirements by Government Officials.

(a) Presidential Responsibilities. The President shall:

- (1) Designate a Senior Advisor for Productivity Policy within the Executive Office of the President;

(2) Submit to Congress, together with the annual budget request, a Productivity Investment Report describing federal spending with demonstrated or expected TFP effects; and

(3) Issue an Executive Order requiring each covered agency to adopt a Productivity Improvement Plan within 365 days of enactment of this Act.

(b) Cabinet-Level Requirements.

(1) Each head of a covered agency shall:

(A) Designate a Chief Productivity Officer responsible for coordinating productivity-related programs and reporting requirements;

(B) Submit to Congress and the Office of Management and Budget an annual Productivity Improvement Report describing actions taken, outcomes achieved, and barriers encountered; and

(C) Conduct a regulatory review every three years to identify and propose elimination of regulations that impede productive investment without commensurate public benefit.

(2) The Director of the Office of Management and Budget (OMB) shall:

(A) Develop a federal productivity accounting framework to track TFP impacts of major federal programs and investments;

(B) Require that all proposed major regulations (expected economic impact over \$100 million annually) include a quantitative estimate of TFP effects; and

(C) Publish annual government-wide productivity accounts within 90 days of the close of each fiscal year.

(c) Congressional Oversight.

(1) The Comptroller General of the United States shall conduct a biennial evaluation of the implementation of this Act and submit findings and recommendations to the relevant congressional committees.

(2) The heads of relevant committees of the House and Senate shall conduct annual hearings on national Total Factor Productivity trends, federal program effectiveness, and the implementation of the National TFP Strategy.

(d) State and Local Government Coordination.

(1) The Secretary of Commerce shall establish a State and Local Productivity Partnership Program to:

(A) Share best practices from high-TFP states and metropolitan areas;

(B) Provide technical assistance to state economic development agencies; and

(C) Offer competitive matching grants to states and localities that adopt measurable TFP improvement programs consistent with the National TFP Strategy.

SECTION 5. Requirements by Corporations.

(a) R&D Tax Credit Enhancements.

(1) Section 41 of the Internal Revenue Code (Research and Experimental Expenditures Credit) is amended to:

- (A) Increase the regular research tax credit rate from 20 percent to 25 percent of qualified research expenses above a base amount;
- (B) Establish an alternative simplified credit at 20 percent for corporations without historical research expenditure data; and
- (C) Create a Super Credit of 30 percent for research conducted in collaboration with accredited universities and federal laboratories.

(2) The Secretary of the Treasury shall issue guidance clarifying that expenditures on artificial intelligence, machine learning, and computational research qualify as research and experimental expenditures under Section 41.

(b) Workforce Investment Requirements.

(1) Corporations with annual revenues exceeding \$1,000,000,000 shall:

- (A) Develop and submit to the Department of Labor an annual Workforce Development Report describing training investments, employee participation in upskilling programs, and apprenticeship engagements;
- (B) Participate in at least one industry-wide sector partnership for workforce training per primary industry classification; and
- (C) Offer employees access to at least 40 hours of employer-supported skill development annually.

(c) Technology Adoption Incentives.

(1) The Secretary of Commerce shall establish a Corporate Technology Adoption Challenge program that:

- (A) Issues competitive grants of up to \$5,000,000 to small and medium-sized enterprises that demonstrate adoption of qualifying advanced technologies and report measurable productivity gains;
- (B) Recognizes top-performing companies with a Presidential Productivity Innovation Award; and
- (C) Publishes an annual Technology Diffusion Index measuring the pace of advanced technology adoption across major industry sectors.

(d) Intellectual Property Transparency.

(1) Publicly traded corporations shall disclose in annual filings with the Securities and Exchange Commission:

- (A) Total R&D expenditures, disaggregated by basic research, applied research, and product development;
- (B) Number of patent applications filed and patents granted; and

(C) Technology licensing revenues and expenditures.

(e) Competition Compliance.

(1) No corporation with a market share exceeding 60 percent in a defined relevant market shall acquire a competitor, startup, or nascent rival without prior approval of the Department of Justice Antitrust Division.

(2) The Federal Trade Commission shall establish a Digital Markets Unit with authority to investigate and remedy anti-competitive conduct in online platform markets that reduce incentives for innovation and productivity improvement.

SECTION 6. Requirements by Private Citizens.

(a) Individual Education and Training Tax Benefits.

(1) The Internal Revenue Code is amended to provide:

(A) A fully refundable Lifelong Learning Tax Credit of up to \$3,000 annually for qualified education expenses in STEM, healthcare, advanced manufacturing, and digital skills for individuals aged 25 to 65 who are not full-time students;

(B) Exclusion from gross income of up to \$10,000 per year in employer-provided educational assistance; and

(C) A Student Loan Repayment Match Tax Credit for employers that match employee student loan repayments up to \$5,250 per year.

(b) Entrepreneurship Support.

(1) The Small Business Administration shall:

(A) Establish a First-Generation Innovator Program providing mentorship, seed funding of up to \$250,000, and business development services to entrepreneurs from underrepresented communities;

(B) Simplify the application process for SBIR grants to reduce time-to-award from the current median to not more than 90 days; and

(C) Create regional Startup Productivity Accelerators in not fewer than 20 metropolitan areas to commercialize university-generated intellectual property.

(c) Worker Mobility and Transition.

(1) Congress declares that non-compete agreements that prevent workers from obtaining employment in their area of expertise impede labor market efficiency and Total Factor Productivity growth.

(2) The Federal Trade Commission is directed to finalize rules limiting the enforceability of non-compete agreements to senior executives with access to legitimately protectable trade secrets.

(3) The Department of Housing and Urban Development shall identify and propose reforms to state and local land-use regulations that impede worker mobility to high-productivity metropolitan areas.

SECTION 7. Penalty Clauses.

(a) Federal Agency Non-Compliance.

(1) Any covered agency that fails to submit a required Productivity Improvement Plan or Annual Productivity Improvement Report within the time periods specified in this Act shall:

(A) Have 0.5 percent of its discretionary appropriation for the subsequent fiscal year withheld pending submission of the required document; and

(B) Be subject to a finding of non-compliance published in the Federal Register by the Office of Management and Budget.

(b) Corporate Non-Compliance.

(1) A corporation that fails to submit a Workforce Development Report as required by Section 5(b) shall be subject to a civil penalty of not more than \$100,000 per violation.

(2) A corporation that knowingly provides false or materially misleading information in an intellectual property transparency disclosure required by Section 5(d) shall be subject to:

(A) A civil penalty of not more than \$1,000,000 per violation; and

(B) Securities and Exchange Commission investigation for possible violations of the Securities Exchange Act of 1934.

(3) A corporation that violates the merger pre-approval requirement of Section 5(e) shall be subject to a civil penalty equal to 4 percent of annual global revenue and divestiture of the acquired entity.

(c) Recovery of Misused Grants.

(1) Any entity that receives a grant under this Act and is found to have misused or misappropriated the funds shall repay the full grant amount, plus interest at the rate determined under Section 6621(a)(2) of the Internal Revenue Code, and shall be barred from receiving future grants under this Act for a period of 5 years.

SECTION 8. Effective Dates and Implementation.

(a) General Effective Date. Except as otherwise provided in this Act, this Act shall take effect 90 days after the date of enactment.

(b) Phased Implementation Schedule.

(1) Within 90 days of enactment: The President shall designate a Senior Advisor for Productivity Policy. The Director of OSTP shall convene the first meeting of the National TFP Strategy Working Group. The Secretary of Commerce shall begin process to expand MEP funding.

(2) Within 180 days of enactment: The National Total Factor Productivity Strategy shall be published. Each covered agency shall designate a Chief Productivity Officer. OMB shall issue guidance on productivity accounting for federal programs.

(3) Within 365 days of enactment: All covered agencies shall submit Productivity Improvement Plans. The Secretary of Labor shall publish the expanded apprenticeship

target implementation plan. The Secretary of Commerce shall establish the State and Local Productivity Partnership Program.

(4) Within 2 years of enactment: The Corporate Technology Adoption Challenge shall begin accepting applications. MEP funding shall reach the minimum statutory level. The Displaced Worker Productivity Transition Fund shall be operational.

(c) Tax Amendments. Amendments to the Internal Revenue Code made by this Act shall apply to taxable years beginning after December 31 of the calendar year in which this Act is enacted.

(d) Annual Reporting. Beginning one year after the effective date, and annually thereafter, the President shall submit to Congress a National Total Factor Productivity Annual Report measuring progress against the targets established in the National TFP Strategy.

SECTION 9. Appropriations or Budgetary Notes.

(a) Authorization of Appropriations. There are authorized to be appropriated the following amounts:

(1) National Science Foundation — additional research grants under this Act: \$5,000,000,000 per fiscal year for fiscal years 2025 through 2034.

(2) National Institutes of Health — translational research partnerships: \$2,000,000,000 per fiscal year for fiscal years 2025 through 2034.

(3) Department of Energy — national laboratory industry partnerships: \$1,500,000,000 per fiscal year for fiscal years 2025 through 2034.

(4) Manufacturing Extension Partnership (NIST/MEP): \$500,000,000 per fiscal year for fiscal years 2025 through 2034.

(5) Department of Labor — apprenticeship expansion and Displaced Worker Productivity Transition Fund: \$3,000,000,000 per fiscal year for fiscal years 2025 through 2034.

(6) Department of Education — STEM education grants: \$2,000,000,000 per fiscal year for fiscal years 2025 through 2034.

(7) Small Business Administration — First-Generation Innovator Program and Startup Productivity Accelerators: \$500,000,000 per fiscal year for fiscal years 2025 through 2034.

(8) Department of Commerce — Corporate Technology Adoption Challenge and State and Local Productivity Partnership Program: \$750,000,000 per fiscal year for fiscal years 2025 through 2034.

(9) Office of Science and Technology Policy — National TFP Strategy development and coordination: \$50,000,000 for fiscal year 2025, and such sums as are necessary for subsequent fiscal years.

(b) Offsets and Budget Neutrality. The Director of the Office of Management and Budget, in consultation with the Congressional Budget Office, shall identify offsetting spending reductions or revenue measures sufficient to ensure that the net budgetary impact of this Act does not exceed \$0 over a 10-year budget window, pursuant to the rules of the Statutory Pay-As-You-Go Act of 2010.

(c) Limitation on Use of Funds. No funds authorized or appropriated under this Act may be used for purposes inconsistent with the findings and purposes set forth in Section 2 of this Act, for the payment of lobbying activities, or for any purpose prohibited by applicable law.

ENDNOTES

1. Penn World Tables 10.01, University of Groningen. <https://www.rug.nl/ggdc/productivity/pwt/>
2. OECD Compendium of Productivity Indicators (2023). <https://www.oecd.org/statistics/productivity-stats/>
3. Canada — Innovation, Science and Economic Development Canada. <https://ised-isde.canada.ca>
4. Australia — Department of Industry, Science and Resources. <https://www.industry.gov.au>
5. United Kingdom — UK Research and Innovation. <https://www.ukri.org>
6. Norge — Research Council of Norge. <https://www.forskingsradet.no/en/>
7. Sverige — Vinnova. <https://www.vinnova.se>
8. Suomi — Business Suomi. <https://www.businessfinland.fi>
9. Deutschland — Federal Ministry for Economic Affairs and Climate Action. <https://www.bmwk.de/Navigation/EN/Home/home.html>
10. République française — Bpifrance. <https://www.bpifrance.fr>
11. Zhongguo — Ministry of Science and Technology. <https://www.most.gov.cn/eng/>
12. Nippon — Nippon Science and Technology Agency. <https://www.jst.go.jp/EN/index.html>