FOREIGN AFFAIRS

Productivity Is Everything

Why Economic Policy Misses What Really Matters

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For the United States, these are trying times. Americans are overcome with an unshakable sense of economic malaise. The top-line indicators are good: unemployment is low, inflation is declining, and the country remains the richest in the world. Yet in poll after poll, most Americans say they are unhappy with the state of the economy today and its prospects for tomorrow. Only a quarter consider the economy good or excellent. Nearly 80 percent say they are not confident that their children will live better than they do.

Analysts have spent years discussing the country's particular challenges. They have talked about its aging population, which is widening federal budget deficits as entitlement spending collides with an antipathy to tax increases. They have looked at the growing threat of climate change, which requires an overhaul of the U.S. energy sector. They have noted the widening wealth and

income gaps in our changing economy. And they have fretted over foreign autocrats who are menacing U.S. security.

But the public debate too often overlooks a common factor behind all these challenges, one that will shape whether the United States can address them: labor productivity. Commonly measured as the amount of goods and services generated per worker, productivity is the central determinant of a nation's average standard of living and its overall economic success. Growth over time in productivity is why Americans today can consume more goods and services than their grandparents—even as they work fewer hours. Productivity growth fuels rising wages and profits, which generates more fiscal revenue, allowing Washington to build formidable defense capabilities. And productivity growth bolsters the country's soft power, demonstrating the strengths of a democratic, market-oriented society.

From the end of World War II to 1973, U.S. business productivity (outside of farming) grew at a brisk annual rate of 2.8 percent. But over the past half-century, the United States' average annual productivity growth has been much slower. From 1973 to 1995, it slumped to a rate of just 1.4 percent. For the next decade, it rebounded to an average of 3.0 percent. But since 2005, labor productivity has increased only slightly from year to year, at an average of just over 1.5 percent. It bounced around during the pandemic, soaring in one year and falling in the next, and the most recent data is encouraging. But it is too soon to call that change in trend.

These seemingly small annual differences carry massive implications when compounded across decades. For example, the 2015 *Economic Report of the President* calculated that if productivity grew from 1973 to 2013 at the pace it had over the previous 25 years, incomes would have been 58 percent higher in 2013 than they actually were. If these gains were distributed

proportionately, the median household would have earned an additional $30,000 annually.

To be sure, almost all other high-income countries also experienced a post-1973 productivity slowdown. Many had more severe declines: from 2008 to 2024, for example, British productivity has cumulatively grown by just 6.1 percent, or an average of 0.4 percent per year. But the United States' comparative edge does not mean American productivity is growing fast enough. And as productivity growth has decelerated in the United States, it has taken off in China. The growth there has driven China's transformation from an impoverished, isolated nation into Washington's primary economic and geopolitical competitor.

To fully address its domestic woes and global challenges, the United States will need to spark a productivity renaissance. Economists know what won't work. Any initiatives that build barriers to the flow of ideas, capital, and people (beyond what is essential to protect national security) are all doomed to fail. So is trampling on international alliances to fight climate change and pandemics and mindlessly cutting government investment in research to enable growth in entitlement spending. Crowding out private, productivity-enhancing investment by running up the federal debt will not succeed, either.

Knowing what will improve productivity is harder. But economists are aware of policies that tend to be effective: spending on basic research and development, investing in education and training, and engaging with the global economy through immigration and cross-border investment. Such policies will not improve productivity overnight, and the United States will need separate measures to make sure everyone can enjoy a boom—such as resources to support workers whose jobs might be destroyed by generative

artificial intelligence. But if Washington recommits to this trifecta of tools, the United States will likely see faster productivity growth. It could then begin to solve many of the country's most intractable problems.

UPS AND DOWNS

Economists have long recognized the importance of productivity. The more productivity grows, the more income households receive and the higher the level of material well-being they can attain. "Productivity isn't everything," the Nobel economics laureate Paul Krugman wrote in 1990. "But in the long run, it is almost everything."

So how does a country raise productivity? Output per worker can increase in one of two basic ways. The first is by boosting the amount of capital available to each worker, such as property, plants, and equipment. The second is through innovation: the discovery both of new goods and services and of more efficient ways to produce existing goods and services. Innovation in turn is spurred by forces such as investments in education (which boosts workers' skills), spending on research and development, and exposure to global competition through international trade, investment, and immigration. Both governments and companies can improve productivity through R & D spending, but scholars have consistently found that the social returns to such outlays exceed the private returns to those performing the R & D, thanks to positive externalities—such as new ideas in one industry sparking innovations in another. This means that markets alone will underinvest in R & D, a problem that can be remedied by government spending.

Academic research has clearly established that innovation has driven most of the United States' productivity growth over the past century. A seminal study by the Nobel economics laureate Robert Solow analyzed the rise in

real gross domestic product per person in the United States from 1909 to 1949 and concluded that about one-eighth of the total increase came from increased capital per working hour, whereas the rest came from technological change. Another, more recent study that examined the period from 1948 to 2013 found that 80 percent of the growth in U.S. per capita GDP was created by the development of innovative ideas.

The economic history of the United States is in many ways the story of these productivity trends. In 1800, most Americans worked in agriculture, where long, grueling hours were the norm. In that year, for example, it took a farmer 344 hours to produce 100 bushels of corn. A century later, it took less than half as long—just 147 hours. By 1980, it took only three. The reasons for this accelerating efficiency were innovations and fresh ideas, including new techniques for cultivating richer land, better machinery, and labor-saving practices. These gains quickly extended to the economy at large. As agriculture became less demanding, the sector required fewer workers, enabling erstwhile farmers to work in a spectrum of other trades, including the high-technology industries of each generation, such as textiles, telegraphs, and telecommunications.

The country also benefited greatly from improved education, high levels of immigration, influxes of foreign capital, and expanding market competition. Consider the first factor. The United States pioneered high school for the masses, thanks to a grassroots "high school movement," as it was called, that was largely funded by taxpayers. In 1910, a high school diploma was a rarity in the United States, the province of elites destined to be ministers, doctors, or lawyers. In 1910, barely nine percent of all American 18-year-olds graduated from high school, and 19 percent of Americans between 15 and 18 were enrolled in high school. But by 1940, the median 18-year-old had a high school diploma, and nearly three-quarters of 14-to-17-year-olds were

in high school. This concerted expansion of secondary education boosted productivity, which grew very rapidly over the 1920s and 1930s. It also helped narrow the earnings gap between the best-paid and worst-paid workers.

The growth in productivity hardly ended there. As the United States emerged as a global superpower at the end of World War II, American policymakers made a series of choices related to public R & D, education and training, and global engagement that together helped drive strong continued growth. In an effort to compete with the Soviet Union politically and economically, the U.S. government dramatically expanded direct spending on R & D in critical areas, including defense technologies, nuclear energy, medicine, and basic sciences. After the Soviets launched Sputnik in 1957, setting off the space race, U.S. spending on R & D surged even higher, peaking in 1965 at 11.7 percent of the federal budget and 2.2 percent of American GDP. The Servicemen's Readjustment Act of 1944, commonly known as the GI Bill, provided returning veterans with funds for college education and other training. In its first seven years, approximately eight million veterans received educational benefits. From 1940 to 1950, the number of degrees awarded by U.S. colleges and universities more than doubled. And the United States helped design and launch three global institutions—the International Monetary Fund, the World Bank, and the General Agreement on Tariffs and Trade—to build stable, competitive, and open global commerce. The result was a golden era of American productivity.

And then, in the mid-1970s, U.S. productivity growth collapsed. Some reasons were external and unexpected, such as the unprecedented oil-price shocks of 1974 and 1979. But others were internal and predictable. By 1973, federal R & D spending had fallen to 6.9 percent of the federal budget; by 1995, it was down to 4.5 percent. By 2019, R & D constituted just 2.8

percent of all federal spending and just 0.6 percent of GDP, the lowest in over six decades. The United States continues to invest more in R & D than any other country, but the level of spending is still far below where it once was and where it should be.

Meanwhile, the United States' educational improvements slowed markedly as secondary schools struggled to boost performance and college tuition marched steadily higher. The global economy, for its part, became more fragmented as the post–World War II stability of fixed exchange rates fell apart. The U.S. government began cutting back on trade agreements and erecting barriers to outside commerce, such as the export restraints slapped on Japanese motor vehicles in the 1980s.

Productivity growth did begin to rebound in 1995, but this unexpected surge was largely the product of one industry: information technology. Research has documented that information technology firms' deepening global engagement through trade, investment, and immigration helped foster the sector's jump in productivity. These gains quickly spread throughout the economy at large as companies in other industries, such as retail, invested heavily in new and lower-cost IT products and reorganized to realize the benefits. The Information Technology Agreement, signed in 1996 by 29 countries, helped facilitate this takeoff by eliminating tariffs on IT. As a result, worker incomes grew quickly across all skill categories, temporarily halting the rise in inequality. Federal tax revenues surged—a major reason why, from 1998 to 2001, the United States ran its first budget surpluses in decades.

But after ten years, this productivity boom faded. This was, in part, because the tariff cuts of the Information Technology Agreement reached their planned end, and countries could not strike a fresh agreement that

eliminated tariffs for newer IT inventions or products. In the nearly two decades since 2005, productivity growth has again slumped, to an annual average of slightly over 1.5 percent. The end of the boom is part of why both income inequality and fiscal deficits have been rising. Pandemic innovations such as remote work have sparked hope for a productivity resurgence, with many companies reporting big gains from such new work arrangements. But many other businesses have reported slowed productivity from these very same practices—and are thus sharply curtailing them.

The collapse in productivity growth has hampered not only prosperity at home but also U.S. competitiveness internationally—especially against China, whose productivity explosion over the past two generations has transformed the nation's economic and military might. From the People's Republic of China's founding in 1949 until the death of its first chairman, Mao Zedong, in 1976, China experienced almost no growth in productivity because of the state's tight control over all economic decisions. But when Chinese leader Deng Xiaoping began to liberalize the economy in 1978, productivity spiked. The share of industrial output produced by state firms fell from 80 percent in 1978 to less than 30 percent by 2016. Foreign direct investment in China by Western multinational companies surged. So did China's exports in the other direction. At the same time, Beijing launched massive public investments in education and research, much as the United States had after World War II. China's total R & D expenditures rose from about $9 billion in 2000 to $293 billion in 2018—the second-largest national total in the world, after that of the United States.

The productivity effects of all these policy changes were profound. A recent World Bank study calculated that from 1979 to 2019, Chinese productivity grew at an annual average of nearly 7.5 percent. In 1980, China's total GDP was only $191 billion, or 1.7 percent of total world output. Its GDP per

person was only about $195, one of the lowest in the world. Forty years later, however, Chinese GDP reached a remarkable $14.7 trillion—17.4 percent of the world's total. GDP per capita rose to $10,408, solidifying the country's middle-income status.

China's productivity growth has clearly slowed in recent years. One reason is the rapid aging of the country's population. Another is Chinese President Xi Jinping's broad reassertion of state control over the economy in key areas such as banking. But this year and next, China's productivity is forecast to grow by about four percent—more than double the rate forecast for the United States. The country continues to innovate and expand its productivity in many key sectors. In clean technology, Chinese companies dominate the global market for electric vehicles, batteries, and solar power. And through its 2013 Belt and Road Initiative and its 2020 Regional Comprehensive Economic Partnership, Beijing has been pushing to build a new global framework for international trade and investment outside the U.S.-led system. Washington, meanwhile, continues to turn more protectionist.

A PRO-PRODUCTIVITY AGENDA

It is wishful thinking to expect that fast productivity growth will suddenly, and sustainably, return to the United States. Some have forecast faster productivity growth, based on the uptick in productivity in recent quarters, for reasons that may include the initial effects of generative AI. But other sensible forecasters also believe productivity will continue to grow slowly. For example, in its latest long-term budget outlook, the Congressional Budget Office projects annual U.S. productivity growth of just 1.4 percent from 2024 through 2054.

But Americans should not have to settle for that low figure. And they don't need to: countries can summon the will to invest in tomorrow even during

their most difficult todays, and the United States can find new ways to raise productivity growth to address internal and external challenges. Rising labor productivity is the best way to generate the resources needed to reduce poverty, restore the vitality of the U.S. middle class, avoid intergenerational strife, and rejuvenate the world's belief in market democracies over autocracies. Washington must therefore make it a top priority to create the conditions for faster and more sustained productivity growth.

To begin, the United States should spend more on research and development—the heart of innovation and thus of productivity growth. Washington should at least triple public funding of basic R & D from today's total of 0.7 percent of GDP to the post–World War II high-water mark of 2.2 percent. This spending should be spread across agencies, including the National Science Foundation, which spans several economic sectors, and the National Institutes of Health, which focuses on health care, one of the United States' lowest-productivity industries. The CHIPS and Science Act of 2022 was a step in the right direction, insofar as it provided $11 billion for new R & D related to semiconductors through both existing and newly created federal agencies and centers. But both this measure and the Inflation Reduction Act focused too much on existing technologies and companies rather than on foundational research at the frontiers of science and engineering. And $11 billion was far too little: 2.2 percent of 2023 GDP would have been $609.9 billion.

The government should also spend more on early childhood education programs. Today, there are about 25 million children in the United States ages five and under. It should provide every one of them with $4,000 worth of high-quality early childhood programming by making an additional annual $100 billion investment. That price tag may seem high, but recent research shows that enormous private and social gains result from investing

in children's potential. A series of studies by the Nobel economics laureate James Heckman and other researchers, for example, looked at two early childhood interventions in North Carolina and concluded that the benefits were seven times as large as the costs.

There is, however, a major economic obstacle to these new federal investments: the country's ballooning deficit. Despite near-full employment over much of 2024, that year's federal deficit hit $1.8 trillion. Interest outlays in the current fiscal year are forecast to be at least as large as the total defense budget. Federal debt as a share of GDP stands at 98 percent—a near-historic high—and without a change in policy will rise inexorably. This is one of several reasons that interest rates on U.S. Treasury debt have surged to levels not seen in decades. To reduce the likelihood that rising interest rates will crowd out productivity-boosting investments, increased federal R & D spending must be fully paid for. The government could do so by reversing the 2017 tax cuts for individuals and households rather than extending them (as the White House and Congress seem poised to do). To be fiscally prudent, the government should not lighten taxes on capital as a means of trying to boost productivity.

To elevate productivity in fiscal discussions, the federal budget process should also require that the Congressional Budget Office and the White House Office of Management and Budget consistently assess productivity when evaluating major pieces of legislation. When the CBO and the OMB have evaluated productivity in the past, they have done so in suspect ways. They have, for example, bought into the idea that cuts in tax rates would generate surges in productivity and thus incomes so large that total tax revenues would rise. This proved not to be the case.

Today's legislative scoring should instead consider productivity effects that are well grounded in academic research. Neither the CBO nor the OMB, for example, properly accounts for how much highly talented immigrants boost innovation and thus productivity—which increases tax revenues. Policymakers should require both bodies to account for productivity effects that are well known from existing peer-reviewed research.

Once they do, every major piece of legislation should receive a productivity impact statement from the two offices. Any legislation that would slow productivity growth should be required to articulate a clear goal that offsets that cost. If Washington wants to force TikTok to sever its ties with China, for example, it must identify legitimate national security concerns that would outweigh how new cross-border restrictions might dull innovation. If it wants to subsidize certain clean energy companies, the goal must be to quicken the transition away from fossil fuels, which would offset the cost to free-market competition. And if Congress decides to provide better housing to low-income families, it should be in service of narrowing inequality, which would make it worth doing even if the process of building new housing is inefficient.

MISSED CONNECTIONS

It will, of course, be difficult to score different bills and rules for productivity growth. The research into what specific decisions can spur productivity is not always straightforward. Economists have long known, for example, that market competition spurs innovation, and the Biden administration was more aggressive in exerting its antitrust power. Yet the productivity effects of this attempt remain unclear.

But it is clear that increased global connections via trade, investment, and immigration boost the productivity of countries and their companies. And it

is not hard to understand why. An economy behind walls must generate its own ideas, technologies, and techniques, whereas one that is open can tap into innovations developed around the world. A country that imposes significant barriers to trade with other parts of the world must rely more on its own investment in new ideas and opportunities, whereas globalized states can tap into savings abroad. And isolated countries must produce their own goods and services, including ones they are not well equipped to provide; connected countries can specialize in their strengths.

Traditionally, the United States has been a model of how globalization boosts productivity. Although the U.S. affiliates of foreign multinational enterprises make up less than one percent of U.S. companies, they accounted for 12 percent of the country's business spending on research and development, 16 percent of investment in plants and equipment, and 23 percent of total exports of goods in 2022. All these innovative activities contribute to the success of businesses and to high-productivity, high-paying jobs. In 2022, foreign companies employed over 8.3 million U.S. workers—of which 34 percent were in manufacturing, compared with 9.5 percent of all U.S. private-sector jobs today. Compensation at these companies averaged $89,296 per worker, about 22 percent above the private-sector average.

The United States has also gained from letting in large numbers of immigrants, who have in turn made outsize contributions to innovation. Migrants, for example, make up only about 14 percent of the U.S. population, but they constitute roughly 38 percent of the country's resident Nobel Prize winners in chemistry, medicine, and physics and 36 percent of its resident Nobel winners in all categories over the past two decades. They make up 24 percent of all the U.S.-based MacArthur Foundation "genius" award winners since 2000. Jensen Huang, the co-founder of Nvidia, the

company whose chips lie at the heart of the AI boom, was born in Taiwan and moved to the United States at age nine.

But now, the United States is turning its back on the world. It has taken existing walls to foreign investment and raised them higher, expanding the breadth and intensity of reviews for outside investors looking to acquire U.S. companies. The country is also contemplating creating a committee that would oversee and potentially limit investments abroad by U.S. companies. And U.S. President Donald Trump has threatened a wide variety of new import restrictions, including a universal tariff of ten or 20 percent on all imported goods and 60 percent on all imports from China. Any such protections will dampen productivity, including by disrupting global supply networks and allowing U.S. companies to raise prices.

Washington is also pursuing more restrictive immigration policies. Trump has proposed mass deportations of less-skilled workers, which would wreak havoc in service industries such as hotels and restaurants. His plans for limiting the immigration of highly skilled workers could also do serious damage. During the 2024 campaign, he voiced support for providing work authorization to all foreign-born students who graduate from a U.S. college or university. Yet his first administration made it much more difficult for highly skilled immigrants to renew their visas.

These plans are particularly troubling given that current immigration limits are already depriving the United States of millions of talented workers. In April 2023 alone, the U.S. Customs and Immigration Service received a record 758,994 eligible applications for just 85,000 H-1B visas, the primary visas given to college-educated immigrants. The restrictions' effect is worsened by the growing efforts of other states to attract the world's talent. In July 2023, for example, the Canadian government created a program to

provide work authorization to up to 10,000 H-1B visa holders in the United States who had recently been laid off. It was a wise maneuver: because H-1B visas are tied to employers, holders who lose their jobs face deportation. It took Canada less than two days to fill all the slots.

STRUCTURAL ADJUSTMENT

U.S. protectionism, however, did not come from left field. It came about because for far too long, policymakers had failed to adequately address the reality that the benefits of globalization do not accrue to every American worker, company, and community. Some people and places in the United States have instead lost jobs, income, and wealth as a result of globalization. Consequently, they have lost the sense of dignity and purpose that comes through work—and lost their trust and belief in the country.

Perhaps the biggest example of this phenomenon is what economists call "the China shock," generated by China's surge of labor-intensive exports into the global economy. Scholars have estimated that between 1997 and 2011, U.S. imports of Chinese goods destroyed as many as two million U.S. jobs across all industries, nearly half of those in manufacturing. The federal government did too little to help these kinds of workers, their families, and their communities. The places most affected by these layoffs have been particularly likely to embrace protectionist candidates, even though, on the whole, protectionism makes for poor economic policy.

To stop the backlash, the United States must figure out a better way to aid workers and communities buffeted by the dynamic forces of globalization and innovation. In fact, doing so is becoming more urgent than ever. As serious as the China shock was in the early years of this century, it might end up being a rounding error in comparison with the scope and speed of job destruction that generative AI could unleash. One recent Goldman

Sachs study estimated that two-thirds of all U.S. occupations are already vulnerable to some form of automation through AI. That estimate could prove too high, and not all these jobs might disappear completely. Many might survive and even become more productive and higher-paying as AI empowers workers to shift to higher-value tasks; in fact, generative AI could end up supercharging productivity growth across the American economy. But widespread, fast job destruction as part of accelerating productivity growth is very much a possibility. In April 2024, the CEO of the Indian-based IT powerhouse Tata Consultancy Services predicted that generative AI could kill off nearly all the world's call centers in about one year.

For the United States, high rates of job destruction—even if accompanied by faster productivity growth—could be devastating politically. It is hubris to assume that Americans, who have grown quite wary of the risks and costs of economic churn, will embrace what generative AI might unleash. Large majorities of Americans are already voicing concerns about the effects of AI on the labor market, including the effect of autonomous vehicles or having AI involved in health care. In the 2023 joint Hollywood strike by the Screen Actors Guild and the Writers Guild of America, the first such joint action since Ronald Reagan was the president of SAG in 1960, a central demand from union leaders was limits on studios' use of AI.

If millions of workers are laid off as the AI innovations widen, no one should be surprised if discontent emerges among American families and communities, as it did with the China shock. When too many Americans feel left out of economic dynamism, they lose trust, faith, and a sense of commitment to any sort of national good. Just as the Luddites resisted the use of new machinery in the early nineteenth century, Americans might refuse to use AI or clamor for restrictions on its deployment.

Washington will thus have to ensure that the productivity gains of artificial intelligence redound to the public at large and commit to ensuring that displaced workers can access new opportunities. One place to start might be giving a $10,000 tax credit for workers displaced by generative AI that they can use to retrain for other jobs. U.S. officials might also slow the rate of generative AI adoption by implementing an automation tax on companies that replace jobs with algorithms. Such a tax would give workers and policymakers alike more time to plan and adjust, and it would provide new revenue for the retraining tax credit. At a minimum, policymakers should rework the current U.S. tax code so that it does not encourage automation by taxing labor at a markedly higher rate than capital investments in technology. Similarly, they could rebalance the mix of incentives between investments in machines, computers, and software and investments in human capital. The market forces for implementing and scaling AI may be dramatically stronger and faster than the ones that galvanized earlier productivity innovations, so policymakers need to respond in kind.

The recent uptick is no doubt encouraging. But it is too soon to say whether this is an actual trend, and no magic wand can conjure faster productivity growth. What is clear is that investments in R & D, in human beings, and in global engagement have a clear record of success. Policymakers should take heed because strong productivity growth will do more than anything else to address the daunting array of internal and external challenges facing the United States. Ultimately, it will allow Americans to live in a more vibrant country and a safer world.