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SEPTEMBER 2024

PRODUCTIVITY

And how to revive it

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A Quarterly Publication of the International Monetary Fund
September 2024 | Volume 61 | Number 3

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On the Cover
Cover artist Eiko Ojala depicts productivity as an expanding circle, indicating growth, and in the details shows elements of a productive society.

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Thank you, Maureen

Maureen Burke, F&D's managing editor for the past seven years, is stepping down to pursue other adventures. Under Maureen's editorial leadership, the magazine has gone from strength to strength. She ensured high-quality editing and layout, including most recently a redesign, while combining her professional excellence with strong team spirit. She will be missed.

—Gita Bhatt, editor-in-chief

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FINANCE & DEVELOPMENT
A Quarterly Publication of the International Monetary Fund

Subscriber services, changes of address, and advertising inquiries:

IMF Publications
Finance & Development
PO Box 92780
Washington, DC 20090, USA
E-mail: publications@IMF.org

Postmaster: send changes of address to *Finance & Development*, International Monetary Fund, PO Box 92780, Washington, DC 20090, USA.

The English edition is printed at Dartmouth Printing Company, Hanover, NH.

Finance & Development is published quarterly by the International Monetary Fund, 700 19th Street NW, Washington, DC 20431, in English, Arabic, Chinese, French, Russian, and Spanish.
English edition ISSN 0145-1707

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Editor's Letter

Productivity and Prosperity

"PRODUCTIVITY ISN'T EVERYTHING," Paul Krugman wrote in his 1990 book, *The Age of Diminished Expectations*, "but in the long run it is almost everything."

Productivity is a foundation of prosperity. The only way a country can raise its standard of living sustainably is to produce more with existing or fewer resources. You cannot do that without improving productivity. It's that simple.

Everything else about productivity is surprisingly complex, however. It is difficult to explain, difficult to measure, and, as the past couple decades show, difficult to improve.

We know that productivity must play a more important role in driving sustained growth as our societies age. But there's no consensus on how to reverse the broad slowdown in productivity growth seen across almost all countries over the past 20 years.

Especially vexing is the sluggish growth of what economists call total factor productivity—a way of measuring how efficiently businesses turn capital and labor into output—the part that basically captures innovation and technology.

Slower gains in total factor productivity account for more than half the deceleration in economic growth since the global financial crisis, IMF analysis shows. Another decade of weak productivity growth could seriously erode living standards and threaten financial and social stability.

This issue of F&D brings together leading researchers to help explain the withering of productivity gains, how to counter these trends, and how to spark economic dynamism.

Yale economist Michael Peters sets the stage by delving into the causes of slowing productivity growth in the US. Declining dynamism in the world's largest economy threatens to reverberate around the globe. Greater immigration to offset a shrinking workforce and stronger competition rules to encourage innovation by smaller, younger, hungrier enterprises could be part of the solution, he concludes.

These small companies can drive productivity gains, writes the University of Chicago's Ufuk Akcigit, who explores why increased US spending on research and development isn't necessarily boosting productivity. He shows how small firms are more innovative relative to their size, suggesting that they use R&D resources more efficiently. As companies grow and dominate their markets, they often shift to protecting their market position, rather than fostering innovation.

"There's no consensus on how to reverse the slowdown in productivity growth seen over the past 20 years."

But while innovation is exactly what's needed to revive productivity growth, it is not sufficient on its own. New technologies and digital transformation, notably artificial intelligence, have the potential over time to underpin a major surge in productivity, writes Nobel laureate Michael Spence. For AI to achieve its full economic potential, however, it must be accessible to all sectors of the economy, and to companies large and small, he notes.

Policies matter, too. Here our contributors suggest that measures should encourage more effective reallocation of resources away from low-productivity firms and support smaller businesses and start-ups—not just large incumbents. This could include targeted tax credits, grants for early-stage innovation, workforce retraining, and policies that encourage competition and reduce barriers to entry for new players.

Understanding productivity growth more fully is crucial because it plays such an outsize role in economic growth—which, as Daniel Susskind of King's College London writes, also demands a renewed approach to help improve people's lives. Ultimately, as Nobel laureate Edmund Phelps writes, a productive society should allow people to enjoy "mass flourishing" from the grassroots up.

There is much more to explore in these pages. I hope these articles stimulate fresh thinking and further the debate. F&D

Gita Bhatt, editor-in-chief

Kaleidoscope

A global view, in brief

THE BIG PICTURE: Thirty years ago the IMF opened its first regional center for technical assistance. Hosted in Fiji, the center is critical to greater IMF engagement in the Pacific. The model has since been expanded to 17 locations around the world. *Above, a woman walks past the Grand Pacific Hotel on a cloudy morning in Suva. IMF Photo/Anirban Mahapatra.*

Central Banks Work Best with Independence

CENTRAL BANKS ARE OFTEN criticized for supposedly misusing their independence, and many have faced rising political pressure. Their campaigns to contain inflation by raising policy interest rates created significant political pushback on fears about slower growth, higher unemployment, and diminished fiscal positions, according to Tobias Adrian, IMF financial counsellor and director of the Monetary and Capital Markets Department.

Amid increased calls for more oversight of central banks, Adrian underscored in a June speech to a Bank of Thailand gathering that history shows what's at stake: "The data is clear," he said. "Higher central bank independence is associated with lower inflation."

Because central bank independence is so important to containing price increases and achieving stable economic growth, Adrian and his colleagues developed a global index aimed at helping policymakers strengthen such independence. The IMF also has a tool for central bank balance sheet stress testing, to assess their financial independence.

"While many central banks worldwide are under pressure," Adrian concluded in the speech, "independence pays off in the long run."

> "While many central banks worldwide are under pressure, independence pays off in the long run."
>
> —Tobias Adrian, IMF financial counsellor and director of the Monetary and Capital Markets Department, at a Bank of Thailand gathering in June 2024.

Overheard

"The battle for global economic prosperity will largely be won or lost in middle-income countries."

—Indermit Gill, World Bank chief economist, on the launch of this year's *World Development Report*, on how developing economies can escape the middle-income trap.

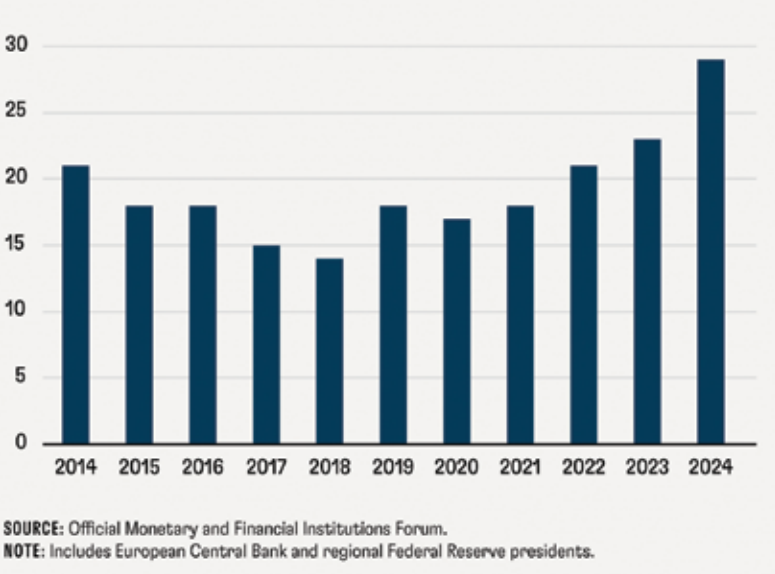
"In principle, industrial policy could be a way of redistributing gains from globalization, but that doesn't look like the way it's being deployed at all. And if we have a whole set of policies that are designed to protect domestic economies, then we're giving up substantial gains from global engagement."

—Catherine Mann, external member of the Bank of England's Monetary Policy Committee, in an interview with IMF Podcasts.

AROUND AND ABOUT: This year Paraguay became the first country in South America to tap the IMF's Resilience and Sustainability Facility. Under the program, the government is committed to expanding its green energy matrix. In July Kristalina Georgieva, IMF managing director, toured the Itaipu hydroelectric dam on the Paraná River. *IMF Photo/Daniel Duarte*

By the numbers

The number of women central bank governors rose to a record 29 this year, according to an index by the Official Monetary and Financial Institutions Forum, a think tank in London.



SOURCE: Official Monetary and Financial Institutions Forum.
NOTE: Includes European Central Bank and regional Federal Reserve presidents.

Back to Basics

Total Factor Productivity

How can economies do more with less?

Robert Zymek

WHETHER WE REALIZE IT OR NOT, we think about productivity all the time. Can I take on another project at work without sacrificing my weekend? Can I save commuting time by working from home? Will this course help me do my job better?

Self-help books on productivity regularly top the sales charts, with recent bestsellers in the United States promising potential readers advice on how to "get more done in less time," "accomplish your goals without stress," or "reclaim your time in a world that demands more."

Macroeconomists think about productivity just as much, and in much the same way. Their focus is the productivity of the whole economy. They refer to this as total factor productivity (TFP).

It's a measure of an economy's ability to generate income from inputs—to do more with less. The inputs in question are the economy's factors of production, primarily the labor supplied by its people ("labor" for short) and its land, machinery, and infrastructure ("capital"). If an economy increases its total income without using more inputs, or if the economy maintains its income level while using fewer inputs, it is said to enjoy higher TFP.

According to the Penn World Tables, the economies with some of the world's highest TFP—countries such as The Netherlands, Norway, Switzerland, and the US—are also among its richest. Considering this association between productive efficiency and economic prosperity, recent trends are worrisome. Recent IMF research shows that TFP growth has slowed around the world since the global financial crisis. In low-income developing countries, it has come to a virtual standstill in recent years.

Living standards

TFP is an important macroeconomic statistic for two reasons. First, improvements in living standards must come from growth in TFP over the long run. This is because living standards are measured as income *per person*—so an economy cannot raise them simply by adding more and more people to its workforce.

Meanwhile, economists have amassed lots of evidence that investments in capital have diminishing returns. This leaves TFP advancement as the only possible source of sustained growth in income per person, as Robert Solow, the late Nobel laureate, first showed in a 1957 paper.

TFP growth is also the answer to those who say that continued economic growth will one day exhaust our planet's finite resources. When TFP improves, it allows us to maintain or increase living standards while conserving resources, including natural resources such as the climate and our biosphere.

The second reason for the importance of TFP in economics is closely related to the first. Large differences in living standards persist across countries. Controlling for differences in national prices, the average person's income in South Sudan, one of the world's poorest countries, was estimated to be less than 1 percent of the average person's in the United States, one of the world's richest, in 2023.

Differences in people's hours worked or their access to capital can explain only a fraction of these cross-country income disparities. The bulk of the disparities—more than 66 percent by one recent estimate—is explained by large cross-country differences in TFP.

This makes it a key concern for policymakers everywhere. For policymakers

DALE CROSBY-CLOSE

in emerging market and developing economies, the central question is how to close the TFP gap with richer countries. Only by doing so will they be able to provide better jobs and a higher standard of living for their people—most critically in Africa's economies that are set to experience strong population growth in the coming decades.

For policymakers in advanced economies, igniting TFP growth is about charting new frontiers of productivity. This is required to make growth sustainable, in the face of both environmental concerns and aging societies. With a shrinking share of working-age adults, which can be only partly offset by immigration, TFP has a vital role to play in maintaining living standards.

Measure of ignorance

How can a country grow more with fewer inputs? There is no straightforward answer to this trillion-dollar economic question. Statistically, TFP is measured as a residual—the part of a country's income that cannot be attributed to factor inputs such as labor and capital, which are easier to quantify. As such it represents a "measure of our ignorance" about what makes some countries rich and others poor.

Over time, economists have chipped away at this residual by identifying at least three variables that are closely related to higher TFP.

First, workforce productivity. TFP is higher in countries where the average worker has more years of schooling, the quality of education and training is better, and the workforce is healthier. These advantages enable the average hour of work to generate more economic value added—in addition to improving the quality of life more broadly.

Second, resource allocation. Even within narrowly defined economic activities, some firms are much more productive than others. It thus matters to an economy's overall productivity if the most productive firms in any given sector are able to attract the bulk of labor and capital. When this is the case, an economy is described as "allocatively efficient." If instead a lot of labor and capital is stuck in relatively unproductive firms, the economy is "allocatively inefficient." This will drag down its TFP.

Third, international trade. Trade incentivizes countries to specialize in industries in which they enjoy a comparative advantage, allowing them to deploy their resources more productively. Access to the global market also offers firms the opportunity to exploit economies of scale, and international competition tends to promote productive firms over their unproductive counterparts.

These three variables suggest a partial blueprint for TFP catch-up by developing economies, where workforces tend to lack access to education and health care, resource misallocation is more prevalent, and barriers to international trade are often higher.

It requires mobilizing financing to improve the public provision of human services, removing taxes and subsidies that distort markets, and lowering barriers to fair competition between firms, as well as opening up to international trade.

Economic studies suggest that this could close some of the TFP gap between rich and poor countries. Yet a large part of this gap continues to elude explanation.

Power of innovation

Moreover, these measures are unlikely to provide much additional TFP growth in advanced economies. They already operate close to the frontier of workforce productivity, allocative efficiency, and trade openness. In these economies, the most likely source of sustained TFP growth is innovation in technology, production processes, and product variety, but there is mounting evidence that the impact of such innovation has slowed in recent decades.

So what can advanced economies do? First, they should "do no harm," by avoiding policy mistakes, such as permitting a decline in market competition, with powerful firms using their monopoly positions to stifle entry and innovation, or reverting to costly trade protectionism. Beyond this, policymakers should craft regulations that tap the possible productivity benefits of recent innovations in green technology, information and communications technology, and artificial intelligence. They should also tackle remaining barriers restricting the opportunity for women and minorities to bring their talents and innovative potential to all sectors of the economy.

The ins and outs of TFP may seem remote from everyday life. But if decades from now humanity suffers less stress and enjoys longer weekends, TFP growth—not self-help books—will likely deserve most of the credit. F&D

"TFP advancement is the only source of sustained growth in income per person, as Robert Solow, the late Nobel laureate, first showed in a 1957 paper."

ROBERT ZYMEK *is an economist in the IMF's Research Department.*

Point of View

We Must Place Our Hope in Multilateralism

Gordon Brown

Only by working together can countries fend off fragmentation and deepening crises

IAIN MASTERTON/ALAMY STOCK PHOTO/PREZENT/ISTOCK

Those who look only to the past or the present are certain to miss the future." These words spoken by President John F. Kennedy six decades ago resonate with renewed urgency today. With every year that passes, the failures of our outdated economic paradigm are exposed and the need for a new one becomes more obvious.

Global challenges that require global solutions are ever present, whether a changing climate or rising cyber threats. And just as we are facing these challenges, the three pillars of the post–Cold War era anchoring the global system—unipolarity, hyperglobalization, and neoliberal economics—are collapsing around us. These seismic shifts are sowing the seeds of a new wave of populist nationalism exemplified by the "America First," "Russia First," "India First," "China First," and often "my country first and only" movements springing up round the world.

First, our unipolar world is giving way to a multipolar world—not a world with many states of equal power but a world of multiple centers of power. Twenty years ago, would President Putin have invaded Ukraine? Would an Israeli prime minister have held out for so long against the advice of a US president? Would Arab leaders have refused to meet a US president when he arrived in the Middle East?

Today, released from what seemed to them like a unipolar straitjacket, countries feel they can afford to hedge their bets, be fence-sitters, and act as "swing states." We have seen this at work in dramatic form in the resistance of half the world—most non-Western countries—to supporting Ukraine in its war against Russia. Today, only 45 countries are imposing sanctions against Russia. Countries feel they can choose to be nonaligned or multi-aligned and can play one big power against another. And as the rising membership of the BRICS group—from 5 to 10, with more members on the way—demonstrates, countries are now forming opportunistic and potentially dangerous liaisons.

Second, we are also moving from the neoliberal world of free-trade economics to a more mercantilist world defined by US "friend-shoring," European "de-risking," and Chinese "self-reliance." With this protectionist shift,

Illustration by Chantal Jahchan

governments are now playing a far more significant role in economic policy—and not principally through higher tariffs but through import and export bans, technology bans, and investment bans, as well as through sanctions.

Last year saw nearly 3,000 trade restrictions implemented globally. The IMF suggests that global losses from increased trade fragmentation could carry a long-term cost of up to 7 percent of global GDP—not to mention a slowdown in cooperation on global issues such as the green transition and AI.

Power-based world order

Third, we have transitioned from free-for-all hyperglobalization to globalization that is more constrained, as security concerns as well as environmental and equity considerations must now be taken into account. Central banks are no longer the only game in town, and a power-based order is replacing a rules-based order. With global trade in services rising, this does not mean deglobalization nor even slowbalization. What we are seeing is the adoption by more than 100 countries of national industrial policies, with over 2,500 protectionist measures recorded in the past year alone.

Purchasing policies based on "just in case" have replaced the familiar formula of "just in time," with resilience and security of supply now preferred to simply getting the lowest price. And as they diversify from their dependence on one producer and adopt "China plus one, two, three, four, or even five" strategies, countries trading with China are relocating their export orders to Vietnam, Bangladesh, Mexico, and others.

With global growth estimated to be 2.8 percent by 2030, significantly below historical averages of 3.8 percent, the IMF's *World Economic Outlook* warns that the 2020s could be the worst decade for growth in recent times. More protectionism will only diminish global growth at a time when further cooperation is required to increase trade and boost prosperity. Extreme poverty, which was to be abolished by 2030 under the United Nations Sustainable Development Goals (SDGs), now stands at about 700 million people. At current rates of progress, poverty will still affect 600 million in 2030.

"Popular disappointment with current leaders is reflected in populist nationalism, with voters blaming globalization itself for their fate when the real culprit is our failure to manage globalization well."

In the 1930s, another era of retrenchment, Winston Churchill said that leaders were "resolved to be irresolute, adamant for drift, solid for fluidity, all-powerful to be impotent." Today popular disappointment with current leaders is reflected in populist nationalism, with voters blaming globalization itself for their fate when the real culprit is our failure to manage globalization well.

But policies to play friend against foe, one-off trade and security deals, and transitory alliances will take countries only so far. The economic future of every continent depends more on a stable international system. Even if for different reasons, all continents need a multilateral order: Europe because it depends on trade; developing economies because they cannot fulfill their economic potential without a transfer of resources from developed economies; middle-income countries because they don't want to be forced into a choice between China and the US—China itself cannot become a high-income country without a thriving export market.

America will also benefit from strengthening the multilateral order. It is no longer in a unipolar world where it can hope to succeed through acting unilaterally. Instead, the US is the obvious leader of a multipolar world to be advanced by working through the very multilateral institutions it created.

Stronger multilateralism

The World Trade Organization should put to best use the undoubted skills of its director-general, Ngozi Okonjo-Iweala, to solve trade disputes by conciliation, arbitration, and negotiation, marking a move away from its overly legalistic and now broken judge-based appeal system.

Simultaneously, the IMF should enhance its role in crisis prevention and crisis resolution. Under the strong leadership of Kristalina Georgieva, the IMF should give more priority to its pivotal role as an early-warning system for the world economy, mobilize its $1 trillion lending capacity to offer better insurance against economic shocks, negotiate a much-improved sovereign debt restructuring mechanism, and thus create a more comprehensive global financial safety net.

With 59.1 percent of voting shares in the IMF held by countries representing 13.7 percent of the world's population, while India's and China's combined share is only 9 percent, the IMF must reform its constitution.

The World Bank must become, as its dynamic new president, Ajay Banga, has proposed, a global public goods bank focused on both human capital and envi-

ronmental stewardship. It is estimated that emerging market and developing economies, excluding China, need $3 trillion a year by 2030 to fund climate action and the SDGs, of which $2 trillion should be raised domestically and $1 trillion will have to come from outside.

The Summers-Singh Group of Twenty (G20) report has proposed that multilateral development banks provide an annual increase of $260 billion. Innovative financial mechanisms, including the use of guarantees to de-risk and scale up private sector investment, must be mobilized to boost and complement these efforts. The World Bank and multilateral development banks will need further funds from shareholders through a capital increase.

Given that the membership of the Group of Seven is too narrow to be the steering committee for the world economy, the G20 should become what it was intended to be: the premier forum for global economic cooperation. For that to work, it needs to be more representative through a constituency system, and it should assemble a professional secretariat that can ensure continuity of policy from year to year.

Maintaining hope in challenging times is essential. Kennedy's nuclear test ban treaty in the 1960s, Ronald Reagan's and Mikhail Gorbachev's nuclear arms reductions in the 1980s, multinational efforts to prevent the depletion of the ozone layer in the 1990s, the 2009 G20 summit stabilizing the global economy, and the more recent Paris accord on climate all demonstrate the potential for global cooperation. But success requires visionary leadership and a willingness to work together.

Two paths are before us. One leads toward global fragmentation and deepening crises, while the other will, if we work collectively, bring prosperity, progress, and hope. I choose hope. F&D

GORDON BROWN *is a former prime minister of the United Kingdom.*

This article draws on a speech by the author at the April 2024 PIIE-IMF conference on steering structural change.

Fairy Dust's Economic Possibilities

Zachary Carter

Keynes celebrated the ideals of the Bretton Woods institutions as a victory for the human spirit

One of the most playful addresses delivered by John Maynard Keynes in his 30 years in public life was also one of his last. Speaking among the "veils and beards of Spanish moss" in the late-winter warmth of Savannah, Georgia, Keynes asked his audience of economists, lawyers, and diplomats to consider, for a moment, the fairies from "Sleeping Beauty."

What, Keynes wondered, might be asked of those benevolent sprites at the "christening" of his beloved "twins"—the World Bank and the International Monetary Fund? Keynes hoped for three "appropriate gifts." First, a many-colored coat to serve as "a perpetual reminder that they belong to the whole world." Second, a set of vitamins to give them "energy and a fearless spirit." Finally, the gift of "wisdom, patience, and grave discretion" to win the trust of peoples in need.

Though it may have been lost on his audience, the invocation of "Sleeping Beauty" was more than a flight of fancy for Keynes; it was a literary allusion reinforcing what he understood to be the fundamental purpose of what became known as the Bretton Woods institutions. Prior

ZACHARY CARTER/CHRONICLE/ALAMY STOCK PHOTO/WOOYAA/ISTOCK

Illustration by Chantal Jahchan

to Walt Disney's 1959 screen adaptation, "Sleeping Beauty" was best known as a lush ballet by the Russian composer Tchaikovsky, itself based upon a German story by the Brothers Grimm, who had drawn from a medieval French folktale. No nation could claim "Sleeping Beauty" as its instrument or property—the story's timelessness was a product of its internationalism.

Brotherhood of man

For Keynes, at least, the Fund and the Bank embodied a geopolitical ideal more deeply cherished than any particular technical or administrative point of order. Indeed, he celebrated the Bretton Woods institutions as a victory for the human spirit, even as many of his own proposals were defeated across multiple rounds of negotiation. "As an experiment in international cooperation, the conference has been an outstanding success," he gushed to Richard Hopkins, a British Treasury official, after the 1944 gathering in the mountains of New Hampshire. "We have been learning to work together," he told the conference itself. "If we can so continue, this nightmare, in which most of us here present have spent too much of our lives, will be over. The brotherhood of man will have become more than a phrase."

One of the great intellectual challenges for Keynes across the final 15 years of his life had been communicating to the economics profession that David Ricardo's theory of comparative advantage was not in fact a substitute for this mode of cooperation, reciprocity, and cultural exchange. The global economy did not consist of two commodities, as it did in Ricardo's famous thought experiment, and technological advance had diminished the significance of the efficiency gains to be harvested from trade liberalization. When US Secretary of State Cordell Hull advanced free trade at Bretton Woods as a solution to the war's devastation, Keynes mocked "the lunatic proposals of Mr. Hull." What mattered in the grand scheme of things was not so much the absence of tariffs but the maintenance of balance and the acknowledgment of the different developmental needs of different countries.

"Policy tools appropriate for this century will not simply replicate those of recent decades."

In the late 1940s, those developmental needs included reconstruction of regions devastated by the war and industrialization of poor countries that had been excluded from the explosive growth Europe and the US had enjoyed since the turn of the century. Cheap imports could help countries access what they could not provide for themselves, but tariffs could also help nations develop or repair their war-damaged industrial sectors. No iron law, Keynes believed, could indicate which made more sense under specific circumstances.

Today, the climate crisis has established new developmental needs for even the wealthiest countries. No nation can hope to mitigate the doom bearing down upon the planet without the swift cultivation and deployment of new, clean technology. The policy tools appropriate for this century will not simply replicate those of recent decades. This is particularly true on questions of international trade, where tariffs, state subsidies, and state-owned enterprises—so often maligned by economists as barriers to innovation and competition—will likely be essential for the development of a healthy global market for climate-friendly industry. For the moment at least, green technologies are infant industries that require far more protection than discipline.

Principle and platitude

Keynes's greatest fear for the Fund and the Bank—expressed implicitly in his Savannah speech by reference to the malign fairy Carabosse, and more explicitly in his dispatches home—was that the "twins" would become instruments of US power rather than truly independent international bodies. And ultimately, the Soviet Union's failure to ratify the Bretton Woods accords meant that both the Bank and the Fund were destined for careers on one side of the Cold War. Absent some forms of trade intervention and protection, the directives of Ricardian comparative advantage will always favor early entrants to the green technology space, leaving a few privileged nations to enjoy the full fruit of development. This is a recipe for domination, rather than cooperation.

But the future is what we make it. By helping different nations pursue new technology and expertise through experimentation with a broad economic policy palette, the Bretton Woods institutions can play a transformative role not only in the fight against climate change, but in the furtherance of international harmony. This is a role that only international institutions can play with any hope of success.

Keynes was aware at Savannah that talk of international coordination and cooperation was "pious words exceedingly difficult to fulfill." The difference between high principle and empty platitude is often difficult to discern on paper—only through persistent communication and sincere dedication can great ideals be sustained. And this will be especially true in climate development policy, where universals will be rare and particulars complex. What makes sense for one country or technology will not necessarily apply to others. But if an international institution can survive for 80 years, outlasting both the Cold War and the 20th century, then it is not unreasonable to hope that it might serve as a forum for innovative cooperation across the next 80. "Fairies or no fairies," as Keynes said at Savannah, "let the omens be good." F&D

ZACHARY CARTER *is a nonresident scholar with the Carnegie Endowment for International Peace and author of* The Price of Peace: Money, Democracy, and the Life of John Maynard Keynes.

Mass Flourishing and Economic Dynamism

Edmund Phelps

Regaining modern values can reverse the slowdown in innovation and its rewards

Why do some nations experience mass economic flourishing while others do not? Why did several Western nations—first the United Kingdom, then the United States, France, and Germany—see a remarkable period of innovation, economic growth, and human progress beginning about 1890? And why did innovation stall after about 1970?

My thesis, developed in my 2013 book *Mass Flourishing: How Grassroots Innovation Created Jobs, Challenge, and Change* and tested in its 2020 sequel, *Dynamism: The Values That Drive Innovation, Job Satisfaction, and Economic Growth*, is that the well-performing nations acquired higher levels of dynamism—the desire and capabilities of the nation's people to innovate. The force behind this innovative dynamism that spurred people in large numbers to conceive innovations was the rise and spread of certain modern values: individualism, vitalism, and a desire for self-expression.

Individualism (not to be confused with selfishness) is the desire to have some independence and to make one's own way. It can be traced back to the Renaissance. In the 15th century, the Italian philosopher Giovanni Pico della Mirandola argued that if human beings were created by God in his image, then they must share to some degree God's capacity for creativity. In other words, Pico foresaw a sense of individualism in which people carved out their own development. Martin Luther spread the spirit of individualism during the Reformation with his demand that people read and interpret the Bible for themselves. Other thinkers that championed individualism were Ralph Waldo Emerson, with his concept of self-reliance, and George Eliot, who embodied the spirit of breaking with convention.

Vitalism is the notion that we feel alive when we are taking the initiative to "act on the world," to use the German philosopher Georg Wilhelm Friedrich Hegel's terminology, relishing discovery and ventures into the unknown. A vitalist spirit swept from Italy through France, Spain, and Britain later, during the Age of Discovery from the 15th until the 17th century. This spirit is found in the great sculptor Benvenuto Cellini's work, with his zeal for competition; in Cervantes's *Don Quixote,* when Sancho Panza, stuck in a place without challenges, goes so far as to hallucinate obstacles for a sense of fulfillment; and later by the French philosopher Henri Bergson, who conceived of people energized by the currents of life involving themselves in challenging projects and transforming themselves in a process of "becoming."

Last, self-expression is the gratification that comes from making use of our imagination and creativity—voicing our thoughts or showing our talents. In being *inspired* to imagine and create a new way or new thing, people may reveal a part of who they are.

Modern values

Modern economies formed in nations where modern values arose. These economies were, at their core, driven by the judgment, intuitions, and imagination of a modern people—mostly ordinary people, as I like to say, working in various businesses. Those nations with high dynamism not only had higher rates of innovation but also higher rates of job satisfaction and happiness linked to nonpecuniary rewards such as feelings of achievement, exercising imagination to create new things, and overcoming challenges. Those nations were conducive to mass flourishing.

By contrast, dynamism was scarce and innovation and job satisfaction less abundant in societies where traditional values, such as conformism, fear of taking risks, service to others, and a focus on material rather than experiential gains, prevailed.

Is there evidence to support my theory? Calculations in *Dynamism* by one of my coauthors, Raicho Bojilov, reveal that innovation was consistently abundant in some countries and consistently meager in some others for about a century.

EDMUND PHELPS

"The economic costs to the West caused by the loss of innovation are serious."

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During the post–World War II period of high innovation (comparable to the historically innovative period from the 1870s to World War I), indigenous innovation rates were strikingly high in the US (1.02), the UK (0.76), and Finland (0.55) but strikingly low in Germany (0.42), Italy (0.40), and France (0.32).

Analysis of 20 Organisation for Economic Co-operation and Development countries by another coauthor, Gylfi Zoega, shows that countries with people possessing high-strength doses of modern values—the US, Ireland, Australia, Denmark, and less so Switzerland, Austria, the UK, Finland, and Italy—did have relatively high rates of indigenous innovation, as my theory predicts.

Moreover, Zoega's statistical investigation shows that values matter. He finds that not only does trust matter—a value neither modern nor traditional, I think—but also "the willingness to take the initiative, the desire to achieve on the job, teaching children to be independent, and the acceptance of competition contribute positively to economic performance . . . measured by TFP [total factor productivity] growth, job satisfaction, male labor force participation, and employment." Teaching children to be obedient, however, reduced economic performance.

Unfortunately, the span of spectacular growth has since slowed. Cumulative growth of TFP in the US over 20-year periods went from 0.381 in 1919–39 to 0.446 in 1950–70, then down to 0.243 in 1970–90 and 0.302 in 1990–2010, Bojilov's calculations show.

The slowdown in innovation and growth does not mean there has been no innovation since the 1970s—there have been breakthroughs in artificial intelligence and electric vehicles, for example. However, most of these innovations come from the high-tech Silicon Valley region of California, a small part of the economy. Massachusetts Institute of Technology economist Daron Acemoğlu commented recently that AI would add no more than 1 percent to US economic output over the next decade.

Loss of innovation

The economic costs to the West caused by the loss of innovation are serious. The resulting near stagnation of wage rates is disturbing to workers who grew up believing that their wages would rise enough to provide them with a better standard of living than their parents'. As capital investments run into diminishing returns that are no longer offset by impressive technical progress, much capital formation has been discouraged. As real interest rates sank to lower levels, the price of many assets, such as houses, rose relentlessly from about 1973 to 2019, so fewer people than ever could afford to live in them.

The social costs have been great, too. General Social Survey household data show that reported job satisfaction in the United States has been on a downhill slide since 1972. Anne Case and Angus Deaton in *Deaths of Despair* show data on the outbreak of despair in America, linking it to economic developments.

The decline of innovation and its rewards is attributable largely to deterioration of those modern values that fuel the dynamism of the people, I believe. The horrific rise of the "money culture," to use a term by American philosopher John Dewey, may weaken a nation's dynamism, as I argue in *Mass Flourishing*.

I am heartened that others are taking interest in further developing my ideas on restoring economic dynamism. Melissa Kearney, director of the Aspen Economic Strategy Group, has for example shifted the organization's research focus from resilience to strengthening dynamism.

Regaining these values and reversing the slowdown of innovation will be hard. Economists ought to design an economy high in dynamism where people can experience mass flourishing from the grassroots up. F&D

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Illustration by Chantal Jahchan

DEMOGRAPHIC DECLINE

Falling fertility and aging populations pose significant challenges for many economies

SIGNIFICANT DEMOGRAPHIC shifts are underway in much of the world. Over half of the world's economies, accounting for two-thirds of the global population, now have fertility rates below the replacement fertility level of 2.1 children per woman. Without action, these populations will age and decline over time.

Countries such as Italy, Japan, and Germany are already experiencing the effects of this demographic transition. Lower birth rates result in a smaller working-age population, which in turn affects economic productivity and increases the burden on social support systems. The ratio of retirees to workers is rising, leading to higher costs for pensions and health care, and putting pressure on public finances.

Several countries with declining demographics are experimenting with innovative policy responses. For example, Nordic countries offer generous parental leave and subsidized childcare to encourage higher birth rates. Similarly, Singapore provides financial incentives for families to have more children. In addition, investing in technology and automation, as seen in countries such as Japan, can help enhance productivity despite a shrinking workforce.

In contrast, areas such as sub-Saharan Africa have high fertility rates, which presents its own set of challenges, including the need to invest in education and healthcare and create jobs to support a young and growing population. However, countries in these regions can also leverage their youthful demographics to support economic growth. F&D

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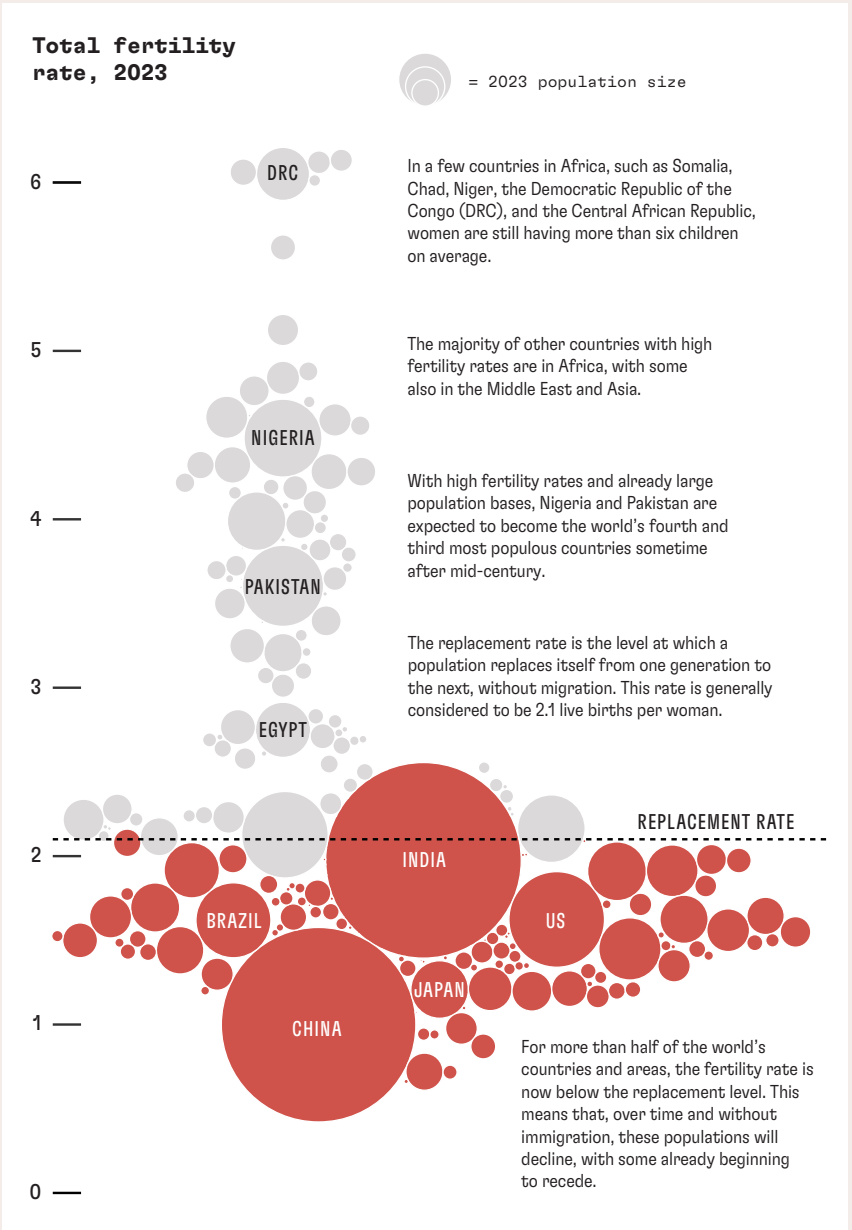
Baby bust

In over half of the world's countries and areas, which account for about two-thirds of the global population, fertility rates are now below 2.1 children per woman on average.

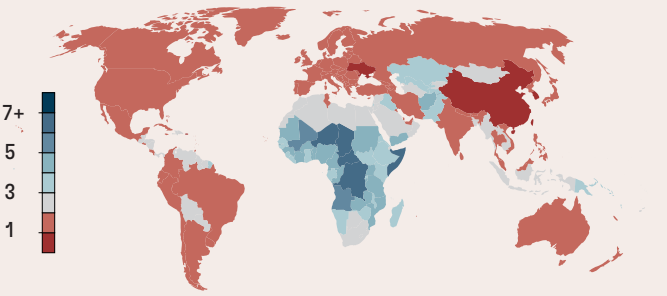


SOURCE: United Nations, World Population Prospects (2024).
NOTE: Not all countries and areas included in the dataset are visible due to small population sizes.

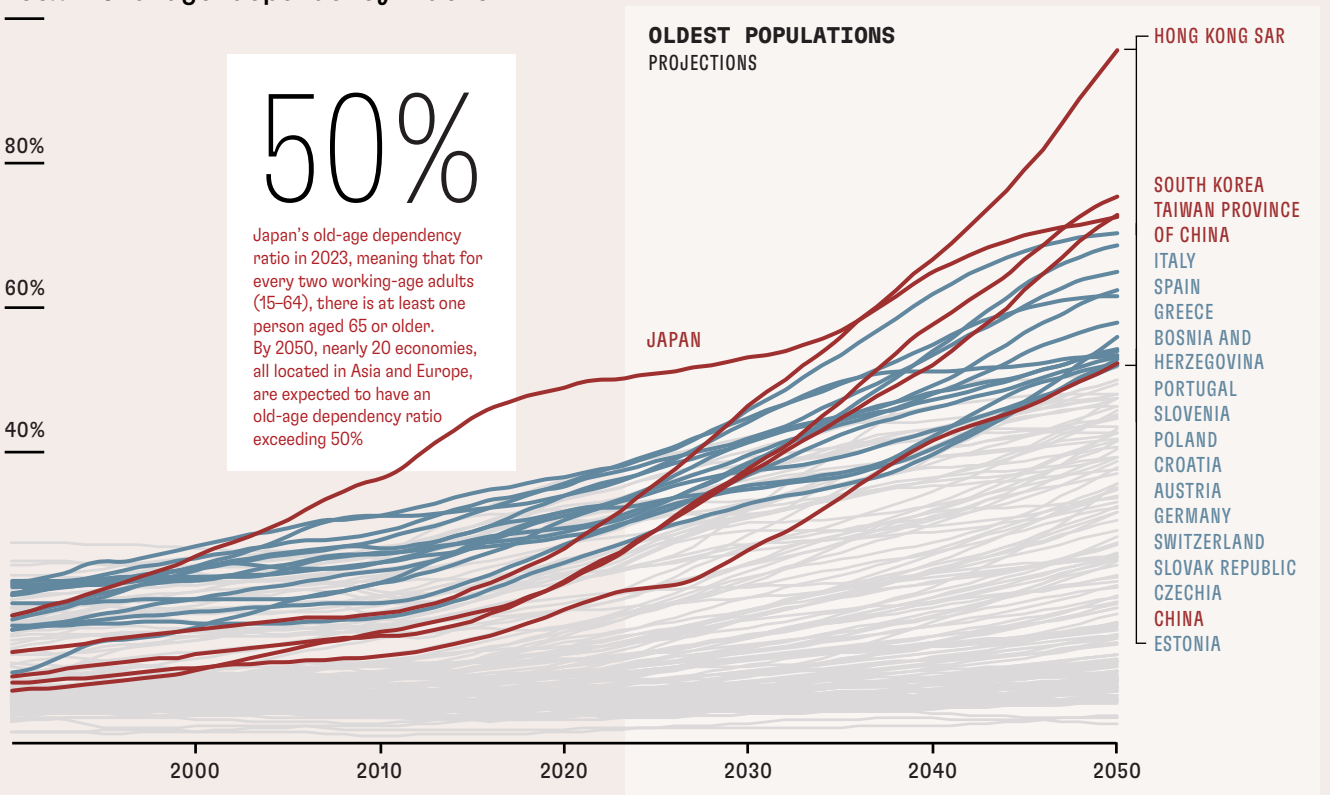
Elderly uptick

As global fertility rates fall—though remaining high in Africa, where the population is surging—many economies face unprecedented demographic shifts. By 2050, the number of people 65 and older will double to 1.6 billion, making population pyramids increasingly top-heavy. This shift will test the sustainability of free health care systems and generous public pensions, as fewer workers support more retirees.

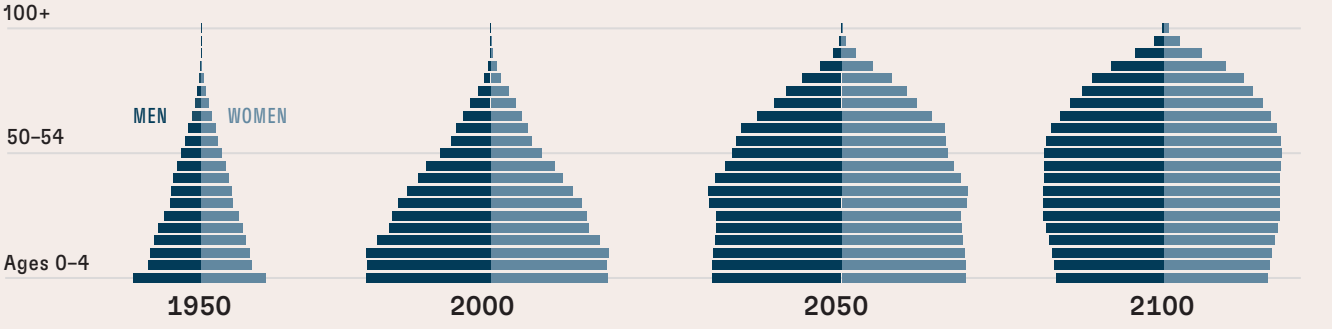
Total fertility rate, 2023



100%: Old-age dependency ratio



Global population pyramids



SOURCE: United Nations, World Population Prospects (2024).
NOTE: Medium-fertility scenario. Only countries and areas with a population of least 1 million shown in line chart. The boundaries, colors, denominations, and any other information shown on the map do not imply, on the part of the IMF, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

AMERICA MUST REDISCOVER

Michael Peters

Slower productivity growth in the world's largest economy threatens to reverberate around the globe

Illustration by Eiko Ojala

ITS DYNAMISM

The US economy has a multitrillion-dollar problem. It's the dramatic slowdown in productivity growth over the past couple of decades. Between 1947 and 2005, labor productivity in the US grew at an average annual rate of 2.3 percent. But after 2005, the rate fell to 1.3 percent. Such seemingly small differences have astonishingly large consequences: if economic output for each hour worked had kept expanding at 2.3 percent between 2005 and 2018, the American economy would have produced $11 trillion more in goods and services than it did, according to the US Bureau of Labor Statistics.

This is part of a broad-based trend across advanced economies. Productivity growth in Europe has been even slower than in the US. As a consequence, Europe has fallen significantly behind the US in terms of GDP per capita. Productivity is a key driver of economic expansion. Its anemic performance in the world's largest economy threatens to send ripples around the globe and into developing economies, where growth is key to lifting millions of people out of poverty.

What's behind the stubborn stall in productivity growth in the US and other advanced economies? Research points to two developments. One is that the rapid deployment of advanced information technologies helped big established businesses at the expense of smaller start-up companies. Another is falling population growth and changing demographics, which reduced the speed of new business creation. Together, those factors led to a decline in *creative destruction,* an important element of innovation as identified by the early 20th century economist Joseph Schumpeter. This sapped dynamism from the US economy.

There are two key measures of productivity growth, which are closely related. The first is labor productivity, or the simple computation of real output per hour of work. The second is total factor productivity (TFP), which also takes into account changes in capital intensity and capacity utilization.

Labor productivity and TFP have evolved in tandem since the 1940s (see Chart 1). Labor productivity gains slowed from the range of 3–3.5 percent a year in the 1960s and 1970s to about 2 percent in the 1980s. In the late 1990s and early 2000s, the US economy experienced a sizable but temporary productivity boom as productivity growth rebounded to 3 percent. Since about 2003, productivity gains have been lackluster, with labor productivity slowing to an average growth rate of less than 1.5 percent in the decade after the Great Recession. Recent economic shocks such as COVID-19 and surging energy prices since the war in Ukraine had a notable impact on employment and inflation dynamics. However, productivity growth has been relatively unaffected and has remained low. Changes in TFP closely mirror the fluctuations in labor productivity growth. While labor productivity growth always exceeds that of TFP because of increases in capital intensity, falling TFP growth drives the decline in labor productivity gains.

"Large incumbent businesses seem to be shielded more and more from competition."

Understanding the causes of the slowdown is crucial because of the high economic stakes. It's also vital for determining whether governments and central banks have effective policy tools to address the issue or whether they must prepare for a prolonged period of lower growth.

Creative destruction

Recent research suggests that changes in the process of creative destruction and reallocation across businesses might hold the key to understanding the productivity slowdown. Aggregate TFP reflects the economy's state of technology and the efficiency of resource allocation. Intuitively, aggregate productivity can be low either because the technologies enterprises use are inefficient or because some businesses may have access to productive techniques, but market imperfections prevent them from displacing less efficient competitors. Productivity growth can stem from the arrival of new and better technologies or from reallocation of resources from unproductive to productive companies.

There is growing evidence that the US economy is not as dynamic as it used to be. A key aspect of business dynamism is new business formation. It is often measured by the entry rate, or the share of enterprises that started operating in a given year. The entry rate fell from 13 percent in 1980 to 8 percent in 2018, according to the US Census Bureau. In addition, US enterprises became substantially larger, with the average number of employees rising from 20 in 1980 to 24 by 2018. Older and bigger companies thus account for a much larger share of economic activity than they used to. These trends indicate significantly declining dynamism in the US economy over almost four decades.

This raises two critical questions. First, why does a decline in business dynamism correlate with a slowdown in productivity growth? Second, what are the fundamental factors driving these trends?

Proximate causes

The link between productive churn, business-to-business reallocation, and aggregate growth lies at the heart of Schumpeter's famous concept of creative destruction, in which new enterprises develop innovative technologies aiming to displace incumbent producers and take their market share. Aggregate productivity growth and markers of business dynamism such as churning and turnover at the company level are therefore two sides of the same coin.

From that perspective, the slowing formation of new businesses and the expanding role of older, bigger companies are exactly what one would expect in times of low productivity growth. The falling entry rate is an indication that the arrival of new technologies might be slowing. And given that entrants are of course younger and, on average, smaller than incumbent businesses, a decline in the entry rate naturally leads to an increase in business size and a rise in concentration.

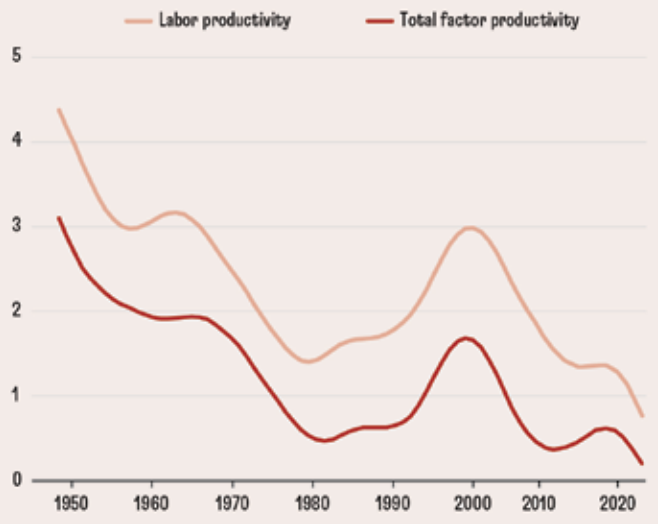
A large and growing body of research provides additional evidence. First, the rise in corporate concentration has been shown to go hand in hand with expanding market power. The average markup by publicly traded US companies surged from about 20 percent in 1980 to 60

CHART 1

Productivity slowdown

US productivity gains have declined continuously since about 2005.

(growth rate, percent)



SOURCE: US Census Bureau, Business Dynamics Statistics.

percent today. Large incumbent businesses thus seem to be shielded more and more from competition, allowing them to jack up prices and widen profit margins.

A second line of research shows the flip side of rising corporate market power: the weakening of workers' bargaining position. Since 1980, labor's share of the US economy has fallen by about 5 percentage points. The plunge was faster in industries that experienced more concentration, where large superstar firms such as Google, Apple, Amazon, and Walmart grew the most—as documented by the Massachusetts Institute of Technology's David Autor and his research partners.

Third, there has been a secular decline in business-to-business reallocation since the late 1980s, as shown in a series of papers by John Haltiwanger and other researchers. This suggests that the process of workers moving from declining to expanding businesses is not as fluid and dynamic as it once was.

These patterns are consistent with the view that creative destruction has been decreasing and that business dynamism and aggregate productivity growth fell as a consequence. If incumbent businesses face less competition from entrants, they have an easier time building a dominant market position. This allows them to expand markups, profit margins, and (eventually) corporate valuations. Because higher profits cut into the share of output paid to workers, a shrinkage in labor's share of the economy will ensue, especially in the most concentrated industries.

Fundamental causes

Even if one were convinced that the productivity slowdown and the decline in business dynamism were driven by a fall in creative destruction, the main question is, Why? Answering this question is particularly important for policymakers seeking clues as to what they can do to reverse these trends.

Researchers have considered four broad explanations:

- The advent of information technology and resulting economies of scale
- Changes in the process of knowledge diffusion
- Demographics and falling population growth
- Changes in policies, such as regulatory entry costs or tax incentives for research and development

While these explanations are not mutually exclusive—and presumably are all relevant in the real world—it is useful to discuss them separately.

IT and economies of scale: In discussing the productivity dynamics of the 1980s and 1990s, the advent of IT is the elephant in the room. Could the availability of such technologies have caused the decline in dynamism and the peculiar boom-bust shape of productivity growth? Two recent papers argue that the answer is yes and that economies of scale play an important role. French economist Philippe Aghion and his research collaborators (2023) posit that advanced IT makes it easier for businesses to scale their operations across multiple product markets. The London School of Economics' Maarten De Ridder (2024) argues that IT allows enterprises to reduce their marginal costs of production at the expense of higher fixed costs.

What these explanations have in common is that the adoption of such technologies is particularly valuable for productive companies. This implies that such businesses took advantage of IT developments in the late 1980s and early 1990s, and the economy experienced an initial productivity boom. More surprisingly, the researchers argue that the existence of these megabusinesses can have dynamic costs in the long run. If new businesses (such as a new IT start-up) expect that they will have a hard time competing with existing enterprises that produce at scale (such as Amazon, Microsoft, or Google), their incentives to enter the market shrink. As a result, overall growth and creative destruction can decline, and incumbent companies benefit by charging higher markups.

Changes in knowledge diffusion: A separate strand of research suggests that the process of knowledge diffusion among businesses has changed in fundamental ways. In particular, the argument goes, in recent decades technologically lagging companies had a harder time adopting technologies of competitors at the productivity frontier. This change could be technological in nature: companies such as Google or Apple may be so technologically advanced that adoption simply becomes

impossible for smaller rivals. At the same time, it could also have legal origins, as large businesses increasingly engage in defensive patenting to protect their technological lead by creating a dense, overlapping thicket of patents. Consistent with this hypothesis, Ufuk Akcigit and Sina Ates (2023) document a substantial rise in the concentration of patenting among superstar firms and estimate that changes in technological adoption can explain why dynamism has declined, why incumbent enterprises enjoy noncompetitive rents, and why productivity growth has fallen.

Slowing population growth: While those explanations link changes in creative destruction and slower productivity growth firmly to changes in the technological environment, some recent papers advance an entirely different explanation. These researchers argue that both the slowdown in productivity gains and the decline in dynamism reflect falling US population growth.

Expansion of the US population has plunged since the 1960s and has reached a historic low in recent years. That falling population growth should lead to falling productivity growth is the hallmark of most theories of economic expansion. My colleague Conor Walsh and I showed in 2021 that slowing population growth also reduces creative destruction and business dynamism by causing a decline in the entry of new businesses. Other researchers have compiled direct empirical evidence on the relationship between population growth, the rate of new business formation, and the resulting process of business dynamics.

Policy changes: Finally, one could think of many changes in policies that could have triggered a decline in business creation and consequently a decline in growth, creative destruction, and dynamism. Examples are changes in regulation, such as licensing requirements; R&D subsidies that benefit incumbents rather than potential entrants; and changes in corporate taxes.

While such policies might be important for specific industries, it seems unlikely that they would offer a significant explanation at the aggregate level. Recent research shows that the observed changes in such policies cannot quantitatively account for the productivity slowdown and the decline in dynamism. More important, the productivity slowdown and the decline in dynamism are not exclusively US phenomena. They also occurred to varying degrees in most developed economies.

Occam's razor

The 14th century principle of Occam's razor—that the simplest explanation is the most likely—suggests focusing on changes that occurred globally rather than policy changes specific to the US. The development of advanced information technology and declines in population growth fit that bill and are most likely to have played an important role in the drop in business dynamism and the slowdown in productivity growth.

Those developments also highlight the potential for specific policies to counter these trends. With respect to changes in demographics, policymakers around the world are already acutely aware of the rising costs of aging populations. While this debate centers mostly on concerns about fiscal sustainability, the economic consequences could be much more pronounced if falling population growth indeed leads to falling productivity growth. Given the limited success of policies to reverse declining fertility, the main policy lever available in the short to medium term is likely to be immigration policy.

By contrast, the policy options related to the ramifications of the IT boom are more specific and arguably directly related to antitrust enforcement. If information technologies indeed caused the increase in concentration, with adverse consequences for productivity growth, the rise in market power harms consumers not only through higher prices but also through slower innovation and growth. This, of course, raises the stakes of competition policy because how to counter the growth slowdown is, quite literally, a trillion-dollar question for policymakers. F&D

"How to counter the growth slowdown is, quite literally, a trillion-dollar question for policymakers."

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AI'S PROMISE FOR THE GLOBAL ECONOMY

Michael Spence

If properly used, it could significantly accelerate economic growth and help productivity growth rebound

The postpandemic global economy is beset by slower growth, the most persistent inflation in decades, limited progress on sustainability, and high borrowing costs weighing on investment, including the massive investments needed for the energy transition. Perhaps the strongest headwind, though, is sluggish productivity growth since the global financial crisis.

AI is our best chance at relaxing the supply-side constraints that have contributed to slowing growth, new inflationary pressures, rising costs of capital, fiscal distress and declining fiscal space, and challenges in meeting sustainability goals. And the reason is that AI has the potential not only to reverse the downward productivity trend, but over time to produce a major sustained surge in productivity.

Of course it will take time. Roy Amara's law applies here as in past episodes of technological transformation: we tend to overestimate the short-run impacts and underestimate the longer-term ones. My best guess (and it is just a guess, based on current patterns of investment) is that we may start to see meaningful impacts in labor productivity by the end of this decade.

All these things result from the collision of three powerful forces.

The first is shocks, including war, pandemic, climate change, geopolitical tensions, resurgent nationalism, and growing focus on national

security in the conduct of international economic policy. These increasingly severe and frequent disruptions are shifting global supply networks toward greater diversification and resilience. But that is an expensive pressure and a contributor to inflationary pressures.

For example, Apple is steering more manufacturing to India, which now produces 15 percent of iPhones. Meanwhile, only South Korea and Taiwan Province of China make (as opposed to design) the most advanced semiconductors, an unsustainable arrangement from a national security perspective.

Diversification of sourcing is reinforced by policy initiatives aimed at bringing important supply chains back home, or at least to friendly countries, while denying adversaries access to goods, technology, and capital. Some of these protectionist policies are to protect domestic workers from foreign competition.

The result is a rapid postpandemic fragmentation of global supply networks that were more cohesive in the postwar years. Supply chains then largely followed economic criteria: efficiency and comparative advantage. Now, it's impossible to maximize resilience and minimize costs at the same time, and we are no longer minimizing costs. Among many factors, this structural shift has contributed to inflationary pressures.

Secular trends

Even as pandemic supply-chain strains eased, a second set of colliding forces is embodied in secular trends that further reduce the economy's supply elasticity and raise costs. These include declining productivity, especially in advanced economies.

These trends also include aging populations in economies that account for more than 75 percent of global output. Declining fertility rates and increasing longevity are slowing the growth of—or even shrinking—the labor force, leaving fewer workers caring for more seniors. Depending on social security systems, this creates fiscal stress at a time when central bank interest rates remain elevated. It's striking that many advanced economies have labor shortages in high-employment sectors. Amid robust aggregate demand, this has impeded growth and added to inflationary pressures, especially in the US. Germany has experienced similar labor supply issues.

The pandemic impact included an increase in sovereign debt levels in a wide range of economies. Global sovereign debt now exceeds global gross domestic product and continues to rise beyond this threshold in the United States, where the ratio is now 120 percent. Europe's ratio is 88.6 percent, with Greece, Italy, Spain, France, Belgium, and Portugal above the average (in the cases of Greece and Italy, by a lot). China's sovereign debt looks lower, except when you count the debt of state-owned enterprises, which form a significant part of the corporate sector. This is partially explained by massive and successful pandemic spending to prevent human suffering, business closures, and damage to personal and corporate balance sheets. One reason demand remained resilient as interest rates rose is exactly because the balance sheet damage that occurred during the global financial crisis was much less in the pandemic economy.

Driverless delivery vehicles drive on a street in Ordos, Inner Mongolia, China, in June 2024.

Finally, in this second category, the powerful multidecade deflationary force associated with emerging market economy growth and the introduction of large increments of productive capacity into the global economy, especially but not exclusively in China, is fading.

Development economists refer to this as the "Lewis turning point." That's the stage of growth at which the underemployed and underused labor in an emerging market economy's traditional sectors

CFOTO/FUTURE PUBLISHING VIA GETTY IMAGES

"The potential gains from AI are set to impact science and technology research, from biology to physics and materials science, and to play a key role in the energy transition."

is largely used up and absorbed by urbanization and better-connected parts of the economy.

Productivity deserves special attention. US productivity growth averaged 1.68 percent from 1998 to 2007, a period during which many Americans got internet access and, later, mobile phones. Productivity growth then slowed to 0.38 percent from 2010 to 2019.

This decline was economy-wide. Productivity growth for the tradable goods and services sectors, which tend to be more productive despite employing less than a quarter of workers, fell from 4.27 percent to 1.23 percent. The large and less productive nontradable services sectors declined from 0.73 percent to effectively zero.

A startling fact is that despite this recent pattern of subdued productivity growth, the US has been a star performer relative to other advanced economies, including all of Europe. In Europe, lagging growth and productivity are attributable in part to less rapid and effective adoption and deployment of digital technologies, and to underdeveloped tech sectors relative to the US and China.

Measured productivity edged up during the pandemic, largely because less productive industries were partially shuttered, while higher-productivity sectors shifted to remote work. We will need more data to know whether this pickup will endure, but similar patterns are visible in other developed economies.

The combined effect of these two sets of forces is a relatively rapid shift from demand-constrained to supply-constrained growth. Growth is subdued. Inflation endures. Real interest rates remain elevated. Many economists, including me, believe that the structural conditions I've described mean borrowing costs are likely to remain elevated, and certainly higher than during the decade following the global financial crisis. That will likely cause important changes in the investment world, including by keeping the cost of capital and discount rates higher and depressing valuations.

It is worth noting that investors disagree and change their minds on the likely path of interest rates. For example, expectations last year for the Federal Reserve to make seven quarter-point

interest rate cuts this year were quickly dashed. Markets are now discounting one to two cuts. Expectations may evolve further toward higher-for-longer rates, and structural conditions point that way.

Technological revolutions

This brings us to the third set of colliding forces: science and technology. There are at least three revolutionary transformations underway. One is the multidecade digital transformation, now accelerated by breakthroughs in AI. The second is a revolution in biomedical and life sciences. The third is the technologies that underpin the transition to sustainable energy.

All three enjoy ample investment. Accelerating progress is driven not only by breakthroughs, but also by the availability of a host of powerful tools that are experiencing declining costs and increased accessibility. Solar costs have plunged in the past decade. Other advances have proliferated, from advanced semiconductors to DNA sequencing to three-dimensional models of hundreds of millions of proteins available for free in a public database.

Developing technologies like these and deploying them for productive uses will spur major structural changes for the world's economies. We can't predict the full scope of what these changes portend, but the effects are sure to be significant.

Emerging technology can produce a sustained surge in productivity, as I argued last year in an article on the potential of generative AI (with James Manyika of Google). This is consistent with other estimates, like that of the McKinsey Global Institute.

Generative AI is the first AI with a humanlike capacity to operate in multiple domains and to detect and switch domains based only on conversational prompts. It can talk about inflation, write computer code, do some mathematics—though this is a work in progress. Superhuman pattern recognition ability makes it a powerful digital assistant. Rather than full automation, the better model is machine-human collaboration, or what is sometimes called "augmentation."

Geoffrey Hinton, a pioneer of modern neural network AI, has a special understanding of the implications. He uses the example of an experienced doctor. While she/he may have treated thousands of patients, medical AI can review and absorb hundreds of thousands. That can make it helpful to the experienced doctor, and even more so for those who are less seasoned. This is consistent with studies of AI applications in other areas, like customer service, where AI digital assistants, trained on past interactions, produced large productivity gains overall and even greater benefits for less experienced agents.

"Despite the shocks and secular headwinds, we have the talent and tools to foster growth, inclusion, and sustainability in the global economy."

AI is general-purpose technology that has applications across the entire economy, by sector and type of work. This is important, because only general-purpose technologies can produce an economy-wide productivity surge.

AI applications are already being built into personal devices such as phones, thanks in part to advanced semiconductors.

That said, challenges need to be overcome to achieve the potential. One is implementing regulation to prevent misuse of the technology and data. That risk-mitigation regulatory agenda is in process across the globe.

Another is overcoming automation bias, or what Erik Brynjolfsson calls the Turing Trap, the strong tendency to view this technology as full automation and thus a replacement for humans.

This is a common view in the media, business, and policy discussions. The widespread concern about dramatic declines in employment reflects this.

Probably the most important policy issue concerns potential gains. For AI to achieve full economic impact over time, it must be accessible to all sectors of the economy, and to companies large and small. There is little doubt that the massive investments undertaken in industries like technology and finance will have a major impact, but the applications need to get to large employment sectors that tend to lag—like government, health care, construction, and hospitality. Pre-AI studies of digital adoption indicate that this broad diffusion pattern is not guaranteed, that left entirely to market forces divergence is possible or even likely.

Policies for accessibility, diffusion, and skills to help realize the full potential of AI are currently weak in comparison with the intense focus on risk mitigation and misuse. Expanding the former without abandoning the latter is an important element of policy rebalancing. This is not to advocate government's picking winners or national champions. On the contrary, effective competition policy should be part of the policy portfolio. In addition, part of the focus needs to be on sectors and businesses that may lag in discovery and adoption, small and medium enterprises for instance. And since jobs will change with AI collaborators, retraining and new skills acquisition deserve priority attention.

Challenges to overcome

The potential gains from AI go well beyond countering postpandemic productivity and growth challenges. They are set to impact science and technology research, from biology to physics and materials science, and to play a key role in the energy transition.

Talent, computing power, and rapidly expanding electricity demand are the main barriers to building increasingly powerful generative AI models. Availability of data is not a major constraint. The internet has ample training data. Of course, there is AI that is not in the generative AI category that is powerful and important. AlphaFold, an AI system that predicts three-dimensional structures of proteins, is an example. For this application you need specialized biology data and expert input on how protein folding works.

It is also true that the mega-platforms that are driving the development of generative AI have business models that rely on personal data and very precise targeting. But to train large language models and the like, you do not need personalized and sensitive data.

The systems powerful enough to train models with billions of parameters reside largely in cloud computing systems in the private sector, mostly in the US and China. That, plus the competition for talent, puts science and academia at a disadvantage. Expanding computing infrastructure to a broad community of researchers and innovators is an important policy step needed to democratize building an open community with a good balance between academic and private innovation. Achieving that balance will support widespread diffusion.

Europe risks falling behind the United States and China in developing and applying AI for three reasons. One is the European Union's relative underfunding of basic research. The second is that it lags in computing power to support research. The third is a failure to fully leverage the large scale of the European economy. With high fixed development costs and relatively low variable costs in digital and AI, scale is a huge advantage in determining return on investment. European capital markets remain fragmented; service market integration is incomplete and hampered by fragmented regulation at the national level. Whether this situation persists or there is a change of direction after the recent European Parliament elections remains to be seen. Two reports to the European Commission—one from Enrico Letta and a forthcoming one from Mario Draghi—advocate elevated investment in digital technology.

China is an AI powerhouse. India, with its strong roots in digital technology, a large and growing internal market, and deep reservoirs of engineering human capital, is likely to be a growing force.

The rest of the emerging market economies may benefit greatly from AI applications, but for the next few years at least, they will be largely consumers of advanced AI technology generated mostly in the US and China.

AI will drive large-scale structural change and disruption for decades. While some will lose jobs via automation or rapid productivity growth, and others will be hired for jobs that are new and created by the technology, it's the workers in the middle who will be most impacted. Here jobs will not necessarily vanish, but they will change. It will be a disruptive process requiring different skills and a lot of organizational change. Both the private and public sectors have important roles in smoothing the transitions.

With policy support to accelerate diffusion across the entire economy, AI could significantly accelerate economic growth and help productivity growth rebound. And if it relaxes the supply-side constraints that are part of the inflation story, indirectly it could lower real interest rates and the cost of capital over time. In a world that requires trillions of dollars of investment to change the equation for energy efficiency and the green transition, that would help. And in the aging part of the global economy, it would help the younger working population support the older group without undue sacrifice.

Despite the shocks and secular headwinds to growth, we do have the talent and tools to foster growth, inclusion, and sustainability in the global economy—but only if we have the will to use them aggressively but wisely. F&D

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ELIMINATING THE PRODUCTIVITY DRAG

Nan Li and Diaa Noureldin

Reforms to address misallocation of resources can boost productivity enough to revive stagnating global growth

PHOTO BY PUNIT PARANJPE/AFP VIA GETTY IMAGES

The global economy has been struggling to regain its footing since the 2008–09 global financial crisis. Forecasts for medium-term growth continue to be downgraded. Advanced economies have seen a deterioration in growth since the early 2000s, and emerging markets experienced similar challenges after the financial crisis.

Our recent study suggests that without timely policy interventions or breakthroughs in technology and its adoption, global growth could stagnate at just 2.8 percent by the end of the decade. That is a significant drop of 1 percentage point from prepandemic levels.

But this outcome is not preordained. Currently, the United States leads the world among our sample countries in allocative efficiency, a measure of how well an economy's resources are distributed to its most productive uses.

We calculate that if less efficient countries could narrow their gap with the United States by just 15 percent, it would boost productivity and stimulate investment, adding about 1.2 percentage points to annual global growth. Structural reforms addressing regulatory barriers, labor market rigidity, and access to financing are key to achieving this.

The benefits of economic growth are well known. Growth leads to improved living standards, more tax revenue for public services, and increased investment in new technologies and businesses, including needed investment to combat climate change and the transition to renewable energy. This is why higher productivity is so important.

In recent years, productivity growth—output increases that are not attributable to growth in inputs such as labor and capital—has markedly decelerated, accounting for more than half of the decline in global growth. In advanced economies, annual productivity growth plunged from 1.4 percent during 1995–2000 to just 0.4 percent after the pandemic. Emerging market economies saw a drop from 2.5 percent during 2001–07 to 0.8 percent. The situation is even grimmer for low-income countries, where productivity growth nose-dived from 2 percent during 2001–07 to nearly zero after the pandemic.

What drives productivity

Higher productivity means more output from the same amount of input. Two main factors drive productivity growth: within-firm improvements and economy-wide allocative efficiency.

Within-firm productivity gains are achieved through better technology, improved management practices, and innovative processes. Companies that adopt state-of-the-art technologies and attract top talent can significantly enhance their productivity. For example, a tech company that invests in cutting-edge research and development can create new products or improve existing ones, thereby expanding its market share and increasing its competitiveness.

The problem is, returns on investment in R&D are diminishing. For instance, in the semiconductor industry, more researchers are needed to double the density of chips. This trend also spans various sectors, including information and communications technology, where rapid gains have notably plateaued since the early 2000s. Therefore, it is imperative to look to other sources of enhanced productivity to sustain economic growth.

That brings us to the second major factor driving productivity growth, allocative efficiency. *Economy-wide allocative efficiency* is about how well an economy's resources are distributed across businesses for their most productive uses. Imagine an economy as a large farm. If the best land is used for growing the highest-value crops, the farm will be more productive overall. In the same way, if an economy's resources flow to the most innovative and efficient companies, those enterprises can grow and drive economic progress. This process ensures that the best businesses thrive, while less efficient ones exit the market.

Addressing misallocation

Unfortunately, misallocation of capital and labor across companies within sectors has increased. This misallocation of resources has been dragging down productivity growth by an average of 0.6 percentage point annually. Without this increase in misallocation, productivity growth could have been 50 percent higher.

The rise in misallocation stems primarily from uneven productivity growth among companies, hampered in many countries by economic frictions that prevent efficient reallocation of resources. Structural frictions, such as regulatory barriers, rigid labor markets, financing constraints, and lack of trade openness tend to be associated with higher misallocation.

Our study finds that two-thirds of the observed misallocation is attributable to persistent structural issues. This suggests that targeted policy interventions, addressing these inefficiencies, could substantially boost productivity and foster growth (see Chart 1).

One policy that supports this goal is the reduction of barriers to market entry and increasing competition. For example, India in 1991 embarked on wide-ranging economic reforms that included

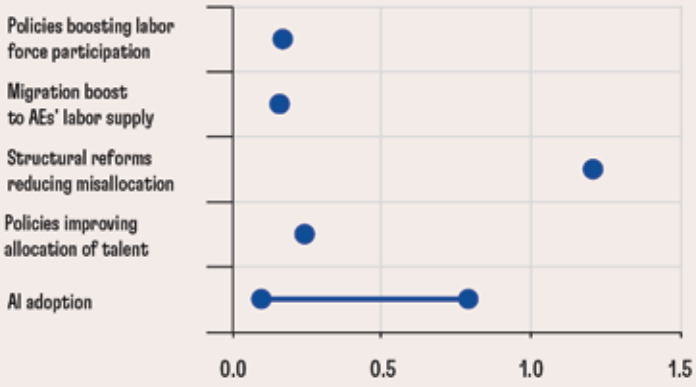
Laborers work at a construction site in Mumbai, India, in January 2022.

CHART 1

Scenario impacts

Structural reforms to allocate resources more efficiently are key to restoring global growth to historical averages.

Impact of various factors on global medium-term growth
(relative to baseline, percentage points)



SOURCES: IMF, *World Economic Outlook*, Chapter 3, April 2024; and IMF staff calculations.
NOTE: Scenarios include policy interventions—aimed at increasing labor force participation, supporting advanced economies' (AEs') labor supply through migration, reducing misallocation, and improving talent allocation in emerging market and developing economies—and scenarios in which AI is widely adopted.

deregulating significant sectors of the economy. The removal of compulsory industrial licensing, also known as the "License Raj," allowed for greater private sector participation and competition. This reform reduced entry barriers and capacity constraints, enabling more efficient allocation of resources.

Another effective approach is liberalization of financial markets, which enables businesses to access the funding they need to grow and innovate. This allows firms with high productivity potential to obtain the necessary capital to expand, rather than being constrained by financial limitations.

Equally important is reducing labor market rigidities to foster a dynamic and adaptable workforce. For example, in Brazil, stringent labor market regulations in the past have driven up costs for formal sector employers, resulting in a significant share of employment in the less productive informal sector. By making it easier for workers to move to where they are most needed, countries can better match labor supply with demand, thereby enhancing overall productivity.

Addressing other institutional barriers that hinder efficient resource allocation is crucial for long-term growth. Issues such as corruption and weak property rights must be tackled through effective governance and institutional reforms. Improving the regulatory framework and ensuring transparent and fair market practices can create a more dynamic and productive economic landscape.

Emerging technologies, such as artificial intelligence, supercomputer chips, biotechnology, and green technologies, have the potential to lift productivity and boost economic growth. For example, AI can optimize supply chains, reduce operational costs, and improve customer service, all of which contribute to higher productivity. In health care, AI-driven diagnostics and personalized medicine are revolutionizing patient care, making it more efficient and effective. Similarly, in manufacturing, AI-powered automation is increasing production speeds and reducing errors, leading to significant cost savings and productivity gains.

Governments should foster an innovation and adoption ecosystem that supports creativity and minimizes frictions in reallocation of research resources. Technological advances are pivotal in enhancing productivity because they allow firms to operate more efficiently and compete effectively in the global market.

A thought experiment

Here is a straightforward yet illuminating thought experiment: What if every country could close its policy gaps with the best-performing economy in terms of labor market flexibility, financial market liberalization, trade liberalization, and the regulation of certain product markets?

If other countries were to narrow their policy gaps with the United States by just 15 percent—an ambitious yet achievable target given historical reform measures—the drag on annual productivity growth from allocative inefficiency could be eliminated, reversing the decline in productivity and boosting growth.

The global economy stands at a pivotal moment. The path forward requires decisive action to enhance productivity through better resource allocation and technological adoption. Historical lessons and many analyses converge on the same point: effective policy interventions can halt and reverse the trend of declining growth. By creating environments where the most productive businesses can thrive and by leveraging the potential of emerging technologies, countries can set the stage for a new era of economic prosperity. F&D

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This article draws on Chapter 3 of the IMF's April 2024 *World Economic Outlook*.

A Multifaceted Challenge

Brazil

A leading emerging market economy, Brazil is progressing to the world's technological frontier as it becomes more integrated with global markets and implements reforms. Worker productivity has increased since a 2017 labor reform, which led to a decline in litigation cases and the costs associated with them. Implementation of a 2023 value-added tax reform is expected to improve resource allocation, particularly in manufacturing, boost investment, and increase formal-sector activities, raising economic growth by 0.3-0.5 percentage points per year. Greater hydrocarbon output is expected to lift medium-term growth. This will improve Brazil's prospects of raising its income closer to that of advanced economies. Investment in green growth opportunities could lift economic potential further.

China

Rapid transformation and integration into global markets drove decades of unparalleled economic performance. But growth has slowed in recent years and is projected to decelerate further amid an aging population and declining productivity growth. The allocation of capital and labor across companies has become less efficient in the service sector, which accounts for more than half of value added. Less productive services companies corner too large a share of the market, while more productive businesses remain too small because they struggle to attract new capital and labor to grow. China should prioritize reforms to improve allocative efficiency. Reforming state-owned enterprises, removing protectionist barriers, and further opening up to international trade in services could boost growth potential.

Euro Area

Europe's productivity growth has lagged the United States since the 1990s, and its companies have failed to match the innovative success of their competitor across the Atlantic. Without a truly integrated market for goods, services, labor, and capital, businesses cannot explore economies of scale or grow as much as their US peers. This is especially true of disruptive start-ups. Inefficient insolvency frameworks slow the exit of unproductive companies, hinder resource allocation, and reduce competitive pressure, including for the adoption of new technologies. An aging population, skills mismatches, and other labor challenges discourage the job churn needed to support productivity growth. A stronger single market would improve competition and allocative efficiency.

Japan

Japan's total factor productivity growth recovered from a decades-long slowdown in the 2010s as companies tried to overcome the constraints imposed by an aging population and tight labor markets by investing in software and digitalization. However, the recovery didn't last, and productivity growth soon slowed again. Despite being one of the world's top spenders on research and development as a share of GDP, Japan has not made sufficient technological breakthroughs to restore productivity to historical levels. In addition, a widening gap between high- and low-productivity companies holds back allocative efficiency: poor-performing companies continue operating for years before they finally close and exit markets. This imposes a drag on economy-wide productivity growth.

THE INNOVATION PARADOX

Ufuk Akcigit

Increased R&D spending isn't necessarily boosting US productivity as industrial giants focus on defending their turf

Clouds surround the tops of buildings in downtown Chicago in 2018.

Investing more in research and development, we've long assumed, is a surefire way to spur innovation, increase productivity, and fuel job creation and economic growth. And yet, as the US dramatically expanded R&D spending over the past four decades, the opposite happened. Innovation, productivity gains, and economic expansion slowed. What went wrong?

Real-world data show that there's more nuance to encouraging innovation than simply throwing money at it. Giant enterprises came to dominate vast swaths of the American economy, crowding out more innovative smaller businesses and start-ups. Across sectors, the biggest players prioritized strategic moves to defend their businesses rather than seeking genuine innovation, and as a result the economy missed potential growth opportunities, according to recent research.

Such findings suggest it's time to rethink and better focus the American approach to ensuring innovation and economic growth. Policymakers need to encourage not only R&D but also the more effective allocation of resources. A look at how US innovation changed over the past few decades suggests how they can do that.

ISTOCK/PEETERV

Double-edged sword

In the 1980s, total US R&D investment represented 2.2 percent of GDP. Today, that figure is 3.4 percent, according to the National Science Foundation (see Chart 1). Private R&D spending by businesses more than doubled, to 2.5 percent of GDP from 1.1 percent.

Based on conventional economic models, that kind of increase in R&D spending should have led to accelerated economic growth rather than the slowdown that actually occurred. Productivity growth between 1960 and 1985 averaged 1.3 percent. Over the subsequent three and a half decades, gains in productivity fell below that average, except for a brief uptick in the early 2000s, and annual growth has generally been declining.

To understand how conventional analysis so badly missed the mark, we need to move away from aggregate data and examine the structure and distribution of R&D spending in the US using high-quality microdata on businesses, inventors, and innovations.

The Census Bureau's Nathan Goldschlag and I conducted extensive studies to understand the factors behind the productivity paradox. We found a significant shift in the US landscape of innovation. Over the past two decades, the proportion of the population involved in patent production nearly doubled, while productivity growth fell by half.

The explanation may lie in how R&D spending is allocated. In earlier research, Harvard's William Kerr and I found that small businesses are more innovative relative to their size, suggesting they use R&D resources more efficiently. As companies grow and dominate their markets, they often shift their focus from innovation to protecting their market position.

In a more recent study, Salome Baslandze, Francesca Lotti, and I showed using Italian data that larger enterprises tend to innovate less and instead engage in activities that limit competition. One such activity is hiring local politicians. As businesses climb the ranks among the largest 20 players in their industry, they hire more politicians, while their patent production declines. This highlights what we call a leadership paradox, where leading companies plow resources into maintaining dominance rather than fostering innovation.

This shift in focus among big businesses might be a pivotal factor in the US productivity slowdown. As dominant players prioritize strategic moves over genuine innovation, the economy as a whole is almost certainly missing out on potential growth opportunities. Understanding this dynamic is crucial for policymakers seeking to effectively encourage true innovation and drive economic growth.

Over the past two decades, there has been

a notable reallocation of innovative resources toward large, established companies, Goldschlag and I documented in 2022. At the beginning of this century, roughly 48 percent of American inventors worked for these big incumbent companies—those that are more than 20 years old and employ more than 1,000 workers. By 2015, that figure had surged to 58 percent, marking a significant shift in where the nation's innovative talent is concentrated.

At first glance, this shift might not seem problematic. After all, the big companies might have the resources to support extensive R&D. However, research shows a concerning trend: inventors that move to large firms become less innovative compared with inventors that move to young firms.

Innovation-stifling hiring

A specific practice identified in our research is innovation-stifling hiring. This occurs when big, established enterprises hire key employees from younger competitors, often by offering higher salaries. However, instead of using these new employees to drive innovation, the big businesses may place them in roles that do not fully leverage their skills. As a result, these individuals become less innovative, and the overall innovative capacity of the economy suffers.

After 2000, there was a notable increase in the wage premium offered by established companies, compared with salaries paid by younger businesses. The pay differential widened by 20 percent, prompting many innovators to switch jobs and join larger, well-established companies (see Chart 2). However, these inventors' innovativeness dropped by 6 percent compared with that of their peers who joined younger employers.

One interpretation of this practice could be that it serves as a strategic move by large enterprises to neutralize potential competitive threats. By hiring away top talent from rivals, these companies not only weaken their competitors but also prevent these individuals from contributing to potentially disruptive innovations elsewhere. This strategy may benefit the hiring business in the short term, but it poses a long-term risk to the economy's overall innovation and growth.

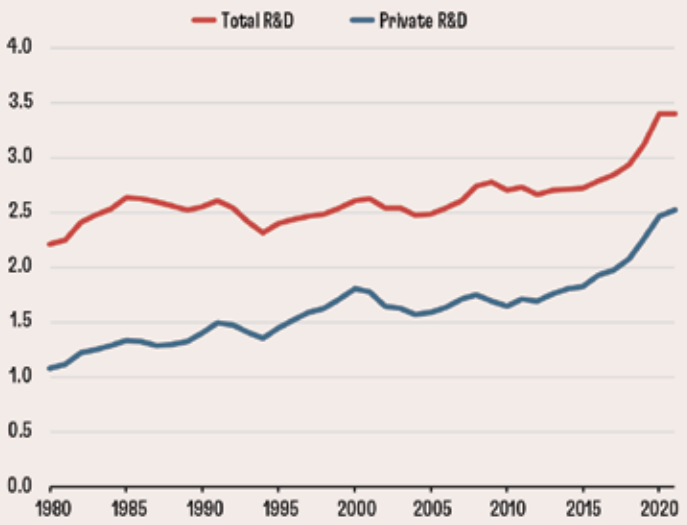
This suggests that while the US has been increasing overall R&D spending relative to GDP, the shift of inventive talent toward large, old businesses has not led to the expected boost in productivity. These industrial incumbents often prioritize maintaining their market dominance over pushing the boundaries of innovation. This defensive stance means that even though more resources are being funneled into R&D, they are not being used as effectively as they could be in smaller, more agile companies.

CHART 1

Research and development

R&D investment in the US has increased since the 1980s, but this hasn't led to improved productivity.

(R&D as share of GDP, percent)



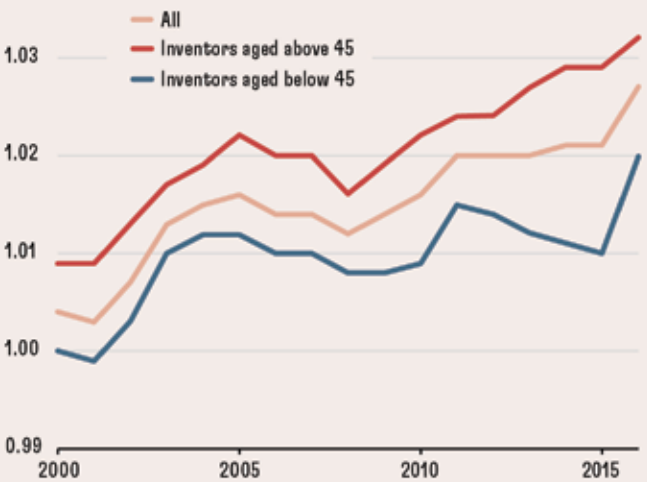
SOURCE: National Science Foundation.

CHART 2

Wage premium

Widening pay differentials have led many innovators to join larger, well-established companies.

(incumbent earnings premia)



SOURCE: Akcigit, Ufuk and Nathan Goldschlag. 2024. "Understanding the Innovation Puzzle: Firm Size, Inventors, and Industrial Policy." University of Chicago Working Paper.

Consequently, the US economy is not benefiting from growth in productivity spurred by R&D spending. This underscores the importance of not just the amount of R&D investment but also where and how it is allocated. To truly harness the power of innovation, policies and incentives need to shift to encourage more dynamic, risk-taking behavior, particularly among smaller enterprises and start-ups. This could lead to the kind of productivity gains the US needs.

Perverse incentives

The debate around the role of industrial policy in the US has intensified, with a renewed emphasis on strong industrial strategies. Reflecting on past experiences can offer valuable insights. The Federal Reserve's Sina Ates and I examined market competition trends in the US over the past several decades. Since the early 1980s, there's been a noticeable increase in market concentration and a decline in business dynamism, we found.

This period aligns with the 1981 introduction of the R&D tax credit, a component of President Ronald Reagan's sweeping Economic Recovery Tax Act. The credit was intended to encourage businesses to invest in research and development. Minnesota was the first state to adopt a similar state-level R&D tax credit, in 1982, and many other states followed, expecting to promote innovation and economic growth.

Which companies are most likely to take advantage of the R&D tax credit? Our research with Goldschlag shows that large businesses are much more likely to benefit than smaller ones. The policy—perhaps unintentionally—favors big companies, encouraging them to dominate in R&D spending.

When we combine this observation with the innovation-stifling hiring practices of large businesses, a pattern emerges. Can policy be linked to more of these practices? It seems the answer is yes. Our research provides direct evidence that businesses actively claiming R&D tax credits are more likely to engage in such practices. These enterprises often offer higher salaries to inventors, and the inventors become less innovative after joining. This suggests that innovation subsidies, while intended to encourage research and development, might inadvertently reduce overall innovation by creating different incentives for market leaders compared with smaller, younger rivals.

The evidence suggests that while the US is investing more in R&D, the concentration of resources among large businesses has led to diminishing returns in terms of productivity growth. This outcome challenges the assumption that simply expanding R&D spending will automatically lead to economic growth. Instead, it highlights the need for a more nuanced approach to industrial policy—one that not only incentivizes R&D but also encourages the effective reallocation of resources.

To foster a more dynamic and innovative economy, the US needs to design policies that support not just large incumbents but also smaller businesses and start-ups, which often have a greater capacity for disruptive innovation. This could include targeted tax credits for small businesses, grants for early-stage innovation, and policies that encourage competition and reduce barriers to entry for new players.

While the US has significantly increased R&D spending over a sustained period, the benefits haven't been evenly distributed, contributing to the slowdown in productivity growth. Policymakers need to reconsider the use of traditional industrial policies, which may have led to reduced competition and slower productivity gains. It's not just about the total amount spent on R&D but also how it's allocated. By creating a more inclusive innovation ecosystem, the US can better tap its innovative talent, boosting economic growth and securing future prosperity. F&D

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The Census Bureau has ensured appropriate use of confidential data and reviewed for compliance with disclosure-avoidance rules (Project 7083300: CBDRB-FY24-CES007-01).

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REMOTE WORK'S GROWTH GIFT

Nicholas Bloom

Working from home is powering productivity and economic growth

Economics is famous for being the dismal science. Sadly, recent work highlighting the slowdown in productivity growth stretching back to the 1950s is no exception. But I take a more cheerful view because of the great productivity gains promised by the pandemic-induced jump in working from home.

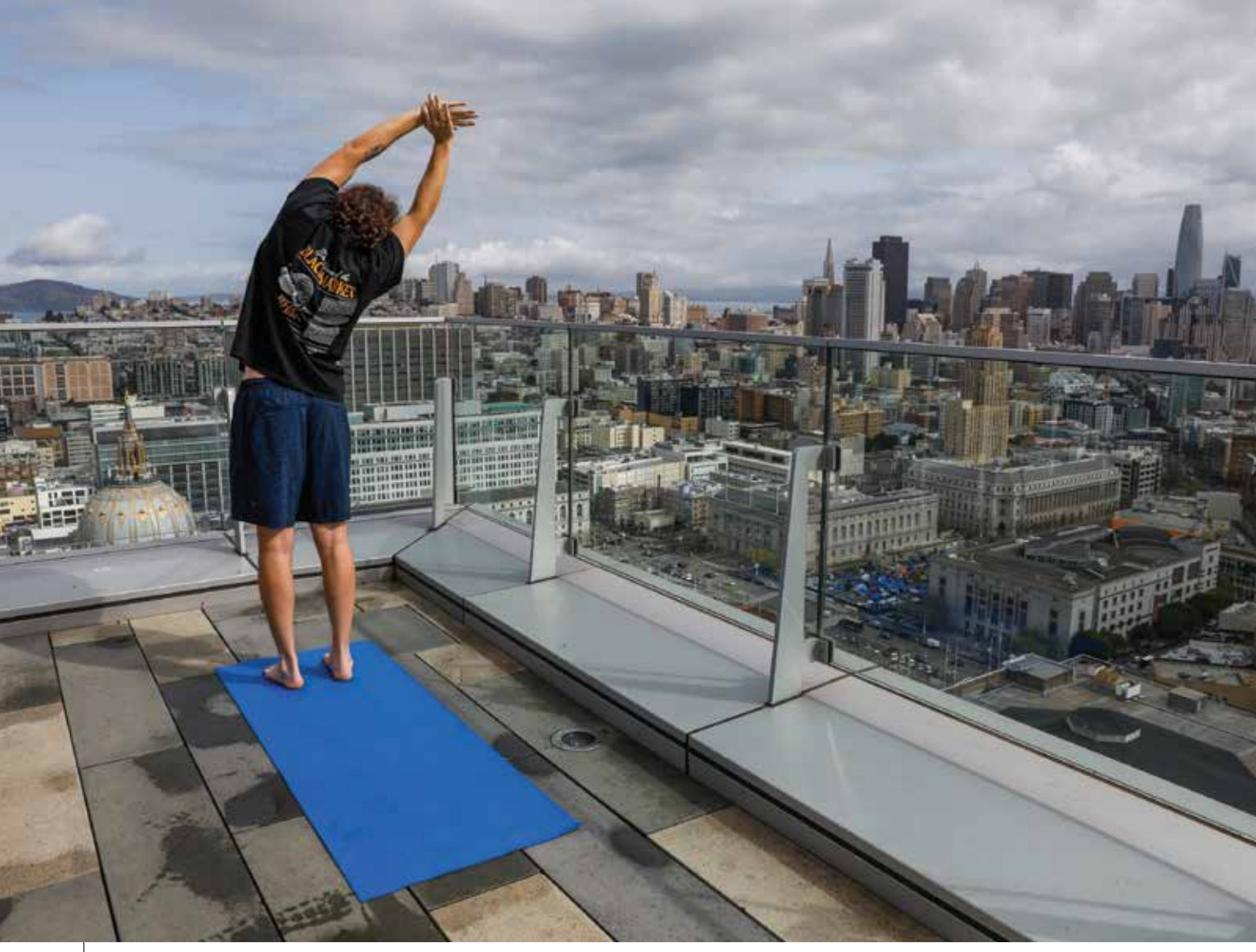
Working from home (WFH) increased about tenfold following the outbreak of the pandemic and has settled in at about five times its prepandemic level (see Chart 1). This could counter slowing productivity and deliver a surge in economic growth over the next few decades. If AI yields additional output, the era of slow growth could be over.

The decomposition of economic growth by Nobel laureate Robert Solow, one of the most famous economists of all time, guides my analysis. Solow's 1957 classic paper highlights how growth comes from both the increase in factor inputs like labor and capital and from raw productivity growth. I hang my analysis on his framework by highlighting in turn how each of these factors will promote faster growth.

Labor

The easiest way to see labor's impact is the survey evidence from across the United States, Europe, and Asia that shows hybrid work is worth about an 8 percent increase in salary. Hybrid work is the typical pattern for office workers, managers, and other professionals, involving usually two or three days a week away from the office. To understand why employees would consider this to be worth 8 percent of their salary, note that typical workers spend about 45 hours a week in the office, yet they spend close to another 8 hours a week commuting. So working from home three days a week saves them about five hours a week, about 10 percent of their total weekly work and commute time.

Most people really dislike commuting, and so place even greater value on this time savings. See, for example, another famous paper, by the Nobel Prize winner Daniel Kahneman. This research



GABRIELLE LURIE/THE SAN FRANCISCO CHRONICLE VIA GETTY IMAGES

Yoga on the roof of an apartment building in San Francisco, California, in March 2021.

found that commuting is the most detested activity in the day, disliked even more than work itself. This makes it easy to understand why the average employee values working from home so much—with its ability to save hours of painful weekly commuting, alongside the flexibility of being able to live farther from work.

This value of working from home has a powerful impact on labor supply. In the global economy there are tens of millions of people who are on the edge of the workforce. So small changes in the attractiveness of work can bring many millions of them into employment. This marginal labor force includes those with childcare or eldercare responsibilities, those close to retirement, and some folks in rural areas.

One example of this WFH impact on labor supply is the approximately 2 million more employees with a disability who are working in the US following the pandemic. These increases in disability employment have occurred primarily in high-WFH occupations. Employees with a disability benefit in two ways: first, by avoiding long commutes and second, by the ability to control their work environment at home.

Another example is prime-age female employment in the US, which has risen about 2 percent faster than prime-age male employment since the pandemic. Women's larger role in childcare could be driving this rise in female labor force participation via WFH, according to recent research.

Collectively these effects could increase labor supply by several percent.

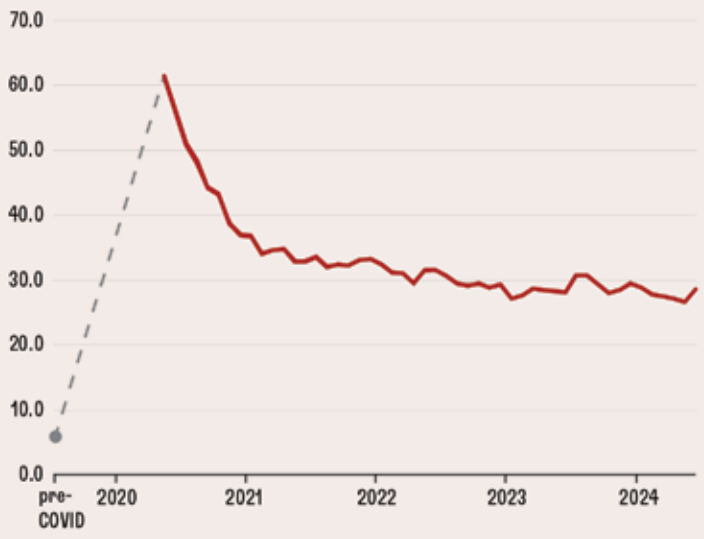
Of course, this calculation takes the current population as given. In the longer run, WFH could also increase fertility rates. One story I've heard repeatedly from talking to hundreds of employees and managers is how working remotely makes it easier to parent. This is perhaps most salient in East Asia, where long workdays, punishing commutes, and intense parenting pressures have led to rapidly dropping fertility. If parents are able to work two or three days a week at home, particularly with flexible schedules that allow them to share parenting responsibilities, this could increase

CHART 1

Remote trend

Working from home in the US has stabilized at about 25 percent of days.

(US full days worked from home, percent)



SOURCE: Barrero, Jose Maria, Nicholas Bloom, and Steven J. Davis. 2021. "Why Working from Home Will Stick." National Bureau of Economic Research Working Paper 28731, Cambridge, MA.

CHART 2

Patent shift

Patents related to technologies that support working from home surged following the pandemic.

(share of new US patent applications supporting working from home)

SOURCES: US Patent and Trademark Office new patent application files. Data to May 12, 2024. Details in Bloom, Nicholas, Steven J. Davis, and Yulia Zhestkova. 2021. "COVID-19 Shifted Patent Applications toward Technologies That Support Working from Home." *AEA Papers and Proceedings* 111: 263–66.

birth rates. Preliminary analysis based on US survey data suggests perhaps 0.3 to 0.5 more desired children per couple when both work from home one day or more a week.

Capital

The beneficial impact of WFH on capital comes from the longer-term release of office space for other uses, like residential and retail. If employees are based at home two or three days a week, society needs less office space, and that space can be used for other activities. It also reduces commuting traffic, curbing the need for additional transportation infrastructure. More intensive use of our home capital—the space and equipment in our houses and apartments—can allow society to save on the use of transportation and office capital, which can be redeployed to other uses. In major city centers about half of the land is covered in office space, and given that office occupancy is now 50 percent below prepandemic levels, there is great potential for office space reduction.

Recent data on driving speeds show that traffic is now moving about 2 or 3 miles per hour faster during the morning commute, which reduces the need for additional transportation infrastructure and saves the typical commuter a few minutes a day.

Over the longer term, allowing employees to work partially or fully remotely also opens up currently underused land for housing, effectively increasing the usable land supply. Many major cities are heavily congested because most employees do not want to live more than a one-hour commute from the center. If they are required at work only a couple of days a week, longer commutes become possible, opening up space farther outside city centers for housing use.

Collectively, these capital contributions could also raise output a few percent over the coming decades.

Productivity

Classic firm and individual micro studies typically find that hybrid work, the usual pattern for about 30 percent of the US, European, and Asian labor forces, has a roughly flat impact on productivity. WFH benefits workers by saving them from exhausting commutes and typically provides a quieter working environment. But by reducing time at the office, it can also reduce employees' ability to learn, to innovate, and to communicate. These positive and negative effects roughly offset each other, generating no net productivity impact of hybrid WFH, research suggests.

The impact of fully remote working, which has been adopted by about 10 percent of employees, is highly dependent on how well it's managed. Some

studies that examined fully remote working during the early days of the pandemic found large negative impacts, potentially because of the chaos of the early lockdowns. Other studies found large positive impacts, typically in more self-directed activities, such as call center or data entry work with well-managed firms.

In summary, the impact of fully remote work is perhaps neutral, because firms tend to adopt it only when such work arrangements match the work activity—often tasks such as coding or IT support, carried out by trained employees in a managed environment. But while the micro productivity impacts on any individual firm may be neutral, the huge power of labor market inclusion means that the aggregate macro impact is likely to be positive.

To explain the benefits of labor market inclusion, consider that fully in-person jobs can be filled only by nearby employees. A human resources or information technology position in New York can, for example, be filled only by a local resident. Even if there are people in Bulgaria, Brazil, or Belize who would be a better fit, they cannot do the job if they are not there in person. But as soon as positions can be filled remotely, employers go from taking the best local employee to taking the best regional employee for hybrid and the best global employee for fully remote work.

Recent studies of work discrimination and reallocation highlight how expanding labor markets to a wider pool of potential employees can have massive productivity benefits. Going from 10 to 10,000 qualified candidates for a position allows a far more productive match, particularly if AI can help screen applicants. Remote work enables global matching between employees and firms, boosting labor productivity.

An additional macro productivity benefit from working from home is its positive impact on pollution from transportation. The WFH surge has curbed commuting traffic volumes across the US and Europe by an estimated 10 percent. This has reduced pollution, particularly emissions of low-level heavy particulates. Health studies have linked pollution to cognitive and productivity damage. Lowering pollution not only improves our quality of life but can also increase growth.

Positive feedback loop

A positive feedback loop—from working from home to faster growth and back—boosts these impacts. A long history of market-size effects in economics highlights how firms strive to innovate to serve larger, more lucrative markets. When you go from 5 million to 50 million people working from home every day, major hardware and software companies, start-ups, and funders take notice. This leads to an acceleration of new technologies to serve those markets, improving their productivity and growth.

That feedback loop has already begun. The share of new patent applications at the US Patent and Trademark Office that repeatedly use "remote work," "working from home," or similar words was flat until 2020 but has started to rise (see Chart 2). This highlights the improvement in technologies. Better cameras, screens, and software and technologies such as augmented and virtual reality and holograms will increase the productivity of hybrid and remote work in the future. This will generate a positive feedback loop between growth and working from home.

One critique of the boom in working from home is the damage to city centers. It's true that retail spending has fallen in city centers, but this activity has relocated to the suburbs, and overall consumption expenditure has resumed its prepandemic trend. Perhaps more problematic is the large reduction in valuations of commercial office space. Although this represents a loss of valuation for investors in the office sector, the release of city center space for residential use will in the long run make downtown living more affordable. The cost of living in the city rose dramatically in the 1990s and 2000s, pricing many middle- and lower-income employees out of city centers. This is especially problematic as many of these workers provide essential services, such as firefighting, policing, teaching, health care, food, transportation, and other work that can only be done in person. Cutting the amount of space for office use in city centers and converting it to residential use would make housing more affordable for these essential workers.

The 2020 surge in working from home has helped offset the prepandemic productivity slowdown overall and is boosting present and future growth. Being an economist usually means balancing winners and losers. Analyzing changes in technology, trade, prices, and regulations usually has mixed effects, with large groups of winners and losers. When it comes to working from home, the winners massively outweigh the losers. Firms, employees, and society in general have all reaped huge benefits. In my lifetime as an economist I have never seen a change that is so broadly beneficial.

This leaves me in the unusual place of being an optimistic "dismal scientist." But it's a place I'm happy to be as I write this while working from home. F&D

DATA

8%

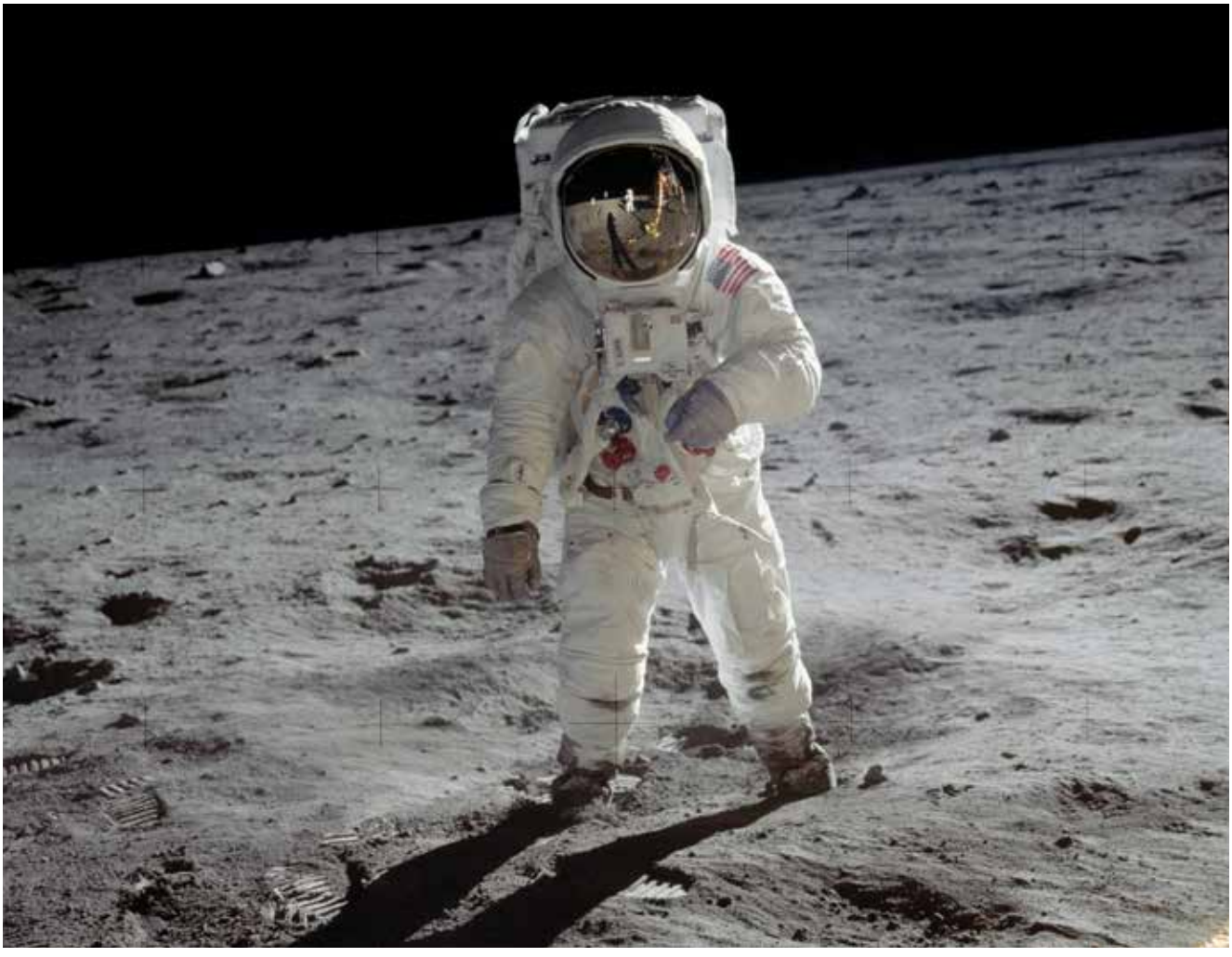
Hybrid work is worth about an 8 percent increase in salary, surveys from the United States, Europe, and Asia show.

NICHOLAS BLOOM *is the William D. Eberle Professor of Economics at Stanford University.*

POLICY WITH A PURPOSE

Mariana Mazzucato

Modern industrial policy should shape markets, not just fix their failures



NASA

The climate crisis is intensifying, with temperatures set to rise at least 1.5 degrees Celsius above preindustrial levels this century. Global warming is inflicting terrible destruction—much of it irreversible—on planet, people, and economies. And we are nowhere near reaching the climate finance flows of at least $5.4 trillion a year by 2030 needed to stave off the worst effects of a hotter planet.

It's worth stating the obvious: the crisis is not an accident but the direct result of how we have designed our economies—particularly public and private institutions and their relationships. This means that we have agency—the power to redesign them to put planet and people first. But to do so we must move beyond fixing markets and the related notion of "financing gaps" toward shaping markets and paying attention to finance's quality not just quantity. We must design policies that tilt economies toward achieving ambitious goals with strong direction while leaving open the question of how to reach those goals. Simply "leveling the playing field" and transferring money won't do.

This requires new economic thinking and a modern approach to industrial policy. Governments must recognize that economic growth is worth striving for only if it's sustainable and inclusive. Growth has a rate but also a direction. To tackle climate change, we must attend to both. Without growth, there are no jobs; without direction, jobs may contribute to global warming and exploit workers. It's the role of governments, as stewards of the public interest, to direct growth and shape markets for a fairer net-zero future.

What does this mean? It means redesigned policies and contracts; it means new partnerships between public and private sectors; it means building instruments and institutions that are fit for purpose; and it means investment in public services.

Mission-led approach

In the past, governments that pursued industrial policies attempted to build national champions by picking winners from among sectors or technologies, often with mixed results. Modern industrial strategy should be different. Instead of picking winners, it should "pick the willing" by setting clear missions—such as solving the climate crisis or strengthening pandemic preparedness—and then shaping economies and markets to accomplish them (Mazzucato 2021).

All sectors, not just a chosen few, must transform and innovate. Just as NASA's 1960s mission to the moon involved not only the aerospace industry but also investment in, for instance, nutrition and materials, so today's climate missions require all sectors to innovate. It means changing how we eat, how we move, how we build. A mission-oriented industrial strategy can catalyze this transformation.

Some leaders who have adopted a mission-oriented approach to industrial policy make the mistake of identifying growth itself as the mission. But stronger macroeconomic performance, as measured by GDP, productivity, or job creation, should be understood rather as the result of all well-designed missions.

Because governments *can* both spur growth and steer it by adopting a mission-oriented approach. An initial public investment can have an amplified impact on GDP through spillover benefits and multiplier effects. It can catalyze innovation and "crowd in" private investment across multiple sectors—particularly important in countries where companies invest little in research and development (Mazzucato 2018). This can spark new solutions to our most pressing problems, such as reaching net zero. But these growth-promoting spillovers will be realized only if public-private collaboration is designed sensibly, to prioritize the common good.

Currently, governments and companies alike are failing to make the necessary pivots to combat global warming. The world spent $7 trillion subsidizing fossil fuels in 2022. The 20 biggest fossil-fuel firms are expected to invest $932 billion developing new oil and gas fields by the end of 2030.

Unless governments change their approach, it's clear that many companies will continue to put windfall profits ahead of investing in productive economic activities or transforming their practices to align with climate goals. And they will continue to contribute to a widening gap between the richest and poorest. S&P 500 companies transferred $795.2 billion to shareholders last year through stock buybacks—about half of that figure coming from the 20 biggest firms. Five of the world's largest listed energy companies transferred $104 billion through buybacks and dividends in 2023. Meanwhile, the share of total income going to workers has declined by 6 percentage points since 1980.

Contract conditions

The terms and conditions governments write into contracts structuring public-private collaboration are a powerful instrument for change. Governments should make access to public funds and other benefits (grants, loans, equity investments,

Astronaut Buzz Aldrin walks on the surface of the moon during the Apollo 11 mission in 1969.

tax benefits, procurement deals, regulatory provisions, intellectual property rights, for instance) conditional on companies aligning their behavior with mission goals. The resurgence of industrial policy—with billions of dollars in public funds flowing to the private sector—is an opportunity to forge a new social contract between the public and private sectors, and between capital and labor.

These conditions must be thoughtfully designed and calibrated to maximize public value but not so specific that they snuff out innovation (Mazzucato and Rodrik 2023). Developers could, for example, be told to follow ambitious net-zero building requirements. But how they do this—through passive house design, tall-timber construction, modular housing, sourcing low-carbon concrete, or other approaches—should be left open.

Conditionalities can take many forms. They can direct firms toward socially desirable goals, such as net-zero emissions, affordable access to the resulting products and services, profit sharing, or reinvestment of profits in productive activities such as R&D rather than unproductive ones like shareholder buybacks.

Conditionalities are underused, but they are not new. The French government's COVID-19 bailout of Air France was conditional on the carrier's curbing emissions per passenger and reducing domestic flights. Germany's national development bank, KfW, provides low-interest loans through its energy-efficient refurbishment program only to companies that agree to decarbonize. It establishes accountability and incentives by providing debt relief of up to 25 percent for buildings that meet the requisite energy standards—the higher the energy efficiency, the greater the relief.

In the US, companies can access funding under the Creating Helpful Incentives to Produce Semiconductors (CHIPS) and Science Act, a key prong of the Biden administration's industrial strategy, only if they commit to climate and workforce development plans. They must also provide accessible childcare, pay certain workers prevailing wages, invest in communities in consultation with local stakeholders, and share a portion of profits above an agreed threshold for funding of $150 million or more. Stock buybacks are excluded from CHIPS funding, and the legislation discourages them for five years.

These are important provisions that—contrary to criticism by skeptics who liken this approach to an "everything bagel"—have not stopped businesses from applying. This critique might have legs if there were too many hard-to-meet provisions. But intelligent design is a feature of any good product—and if more flavors on a bagel taste good and don't cost more, then this is the way to go.

A more justified criticism is that the conditionalities in CHIPS may not go far enough—they allow for significant flexibility with precise commitments negotiated case by case behind closed doors. Labor unions have pushed for funding to be conditional on higher labor standards.

Strategic public finance

Strategic public procurement is another powerful tool. Global public procurement budgets total about $13 trillion a year, accounting for 20–40 percent of national public spending in Organisation for Economic Co-operation and Development countries. Procurement can create new market opportunities and incentivize innovation and investment in line with government priorities. However, public procurement has traditionally focused on efficiency, fairness, cost reduction, risk management, and preventing corruption. It explains why procurement functions are often placed within legal and finance teams rather than policy strategy teams.

New procurement models emphasize outcomes, innovation, social value, or local production. Brazil, for instance, is redesigning procurement to support industrial strategy goals. The US Buy Clean Initiative promotes low-carbon, American-made construction materials in federal projects.

In addition to demand-side policies like procurement, mission-oriented industrial strategies require patient long-term financing directed toward specific ends (Mazzucato 2023). Raising and structuring this type of financing rely on the state's willingness to take on risk. Public financial institutions, such as development banks, should be lenders of first not last resort. They have vast assets: national development banks (NDBs) have $20.2 trillion under management and multilateral development banks (MDBs) a further $2.2 trillion. Together this amounts to about 10–12 percent of global financing. They must be ready to provide countercyclical financing, fund capital development projects, and act as venture capitalists, catalyzing investments aimed at solving specific challenges.

"Economic growth is worth striving for only if it's sustainable and inclusive."

A mission-oriented approach can strengthen connections between NDBs and MDBs, influencing their loan conditions to require that private companies transform production. Loans from Germany's KfW to the national steel sector were conditional on companies lowering the material content of production. This is why Germany has green steel today. If all public banks united to promote sustainability, we could achieve a true Sustainable Development Goal multiplier, as advocated by the United Nations.

More broadly, mission-oriented industrial strategy will struggle for success unless there is a stable and connected national innovation ecosystem. Public institutions should fund innovation and shape it at each stage, from research, to commercialization, to scaling up. Dynamic systems of innovation—centered around outcome-oriented financing, tools, and institutions—can spread knowledge and innovation throughout the economy. Public policy tools and institutions should align with missions (the vertical component of new industrial strategy, in place of sectors in the old) and invest in the broader ecosystem (the horizontal component).

Public sector dynamism

The shift to new industrial strategy requires parallel investment in government capabilities (Kattel and Mazzucato 2018). Closed-minded perceptions of the state's role, cuts to public sector employment, and overreliance on big consulting firms have left many governments ill equipped to implement mission-oriented industrial policy (Mazzucato and Collington 2023). Investment in the teams responsible for rolling out industrial policy, at all levels of government—and attention to the design of the institutions where they are embedded and the tools they have access to—is key to better delivery of this approach's transformative promise.

Industrial policy requires a competent, confident, entrepreneurial, and dynamic public sector—one equipped to take risks, experiment, and collaborate with the private sector on ambitious goals yet open to how those goals are achieved. It must work across ministerial domains (climate is not only for the energy department, just as well-being is not only for the health department). This calls for a fundamentally different approach.

It also requires changes to government institutions to enable new ways of working. "Govlabs" such as Chile's Laboratorio de Gobierno are examples of some countries' safe spaces for civil servants to take risks, collaborate, and learn—allowing them to experiment with different approaches to policy instruments, such as mission-oriented procurement, and then scale them up.

Governments can also develop capabilities to measure the multiplicative effects of industrial policy. Static measures, such as cost-benefit analyses and macroeconomic indicators like GDP, fail to capture the broader impact of mission-oriented industrial strategies. A dashboard of economic, social, and environmental indicators is more effective.

Social and environmental indicators should reflect mission goals and core values. Economic indicators should include spillover and multiplier benefits, alongside standard metrics such as job creation and patent filing. These indicators should be tools for learning and accountability, not missions themselves. Some government ministries, such as the UK Treasury, are updating public spending guidance to establish clear cross-departmental objectives.

Carrying on as usual is not an option. The challenges we face—the climate crisis ranking high among them—are too great. But countries must also resist the temptation to slide into green protectionism by prioritizing their own carbon-neutral development over global cooperation that prioritizes equity and progress toward global climate goals. The US Inflation Reduction Act has driven Europe to prioritize decarbonization of its own industries but is draining financing from emerging economies that climate change harms the most. This is worrisome. It makes it more important to design national industrial strategies carefully and consider the implications for international development, trade, and supply chains so that we tackle our gravest global challenges in a coordinated way.

Modern industrial policy has great potential to put countries on a different path, but only if it orients investment, innovation, growth, and productivity around bold climate and inclusion goals. It must drive a global green race to the top, not to the bottom. F&D

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WE MUST CHANGE THE NATURE OF GROWTH

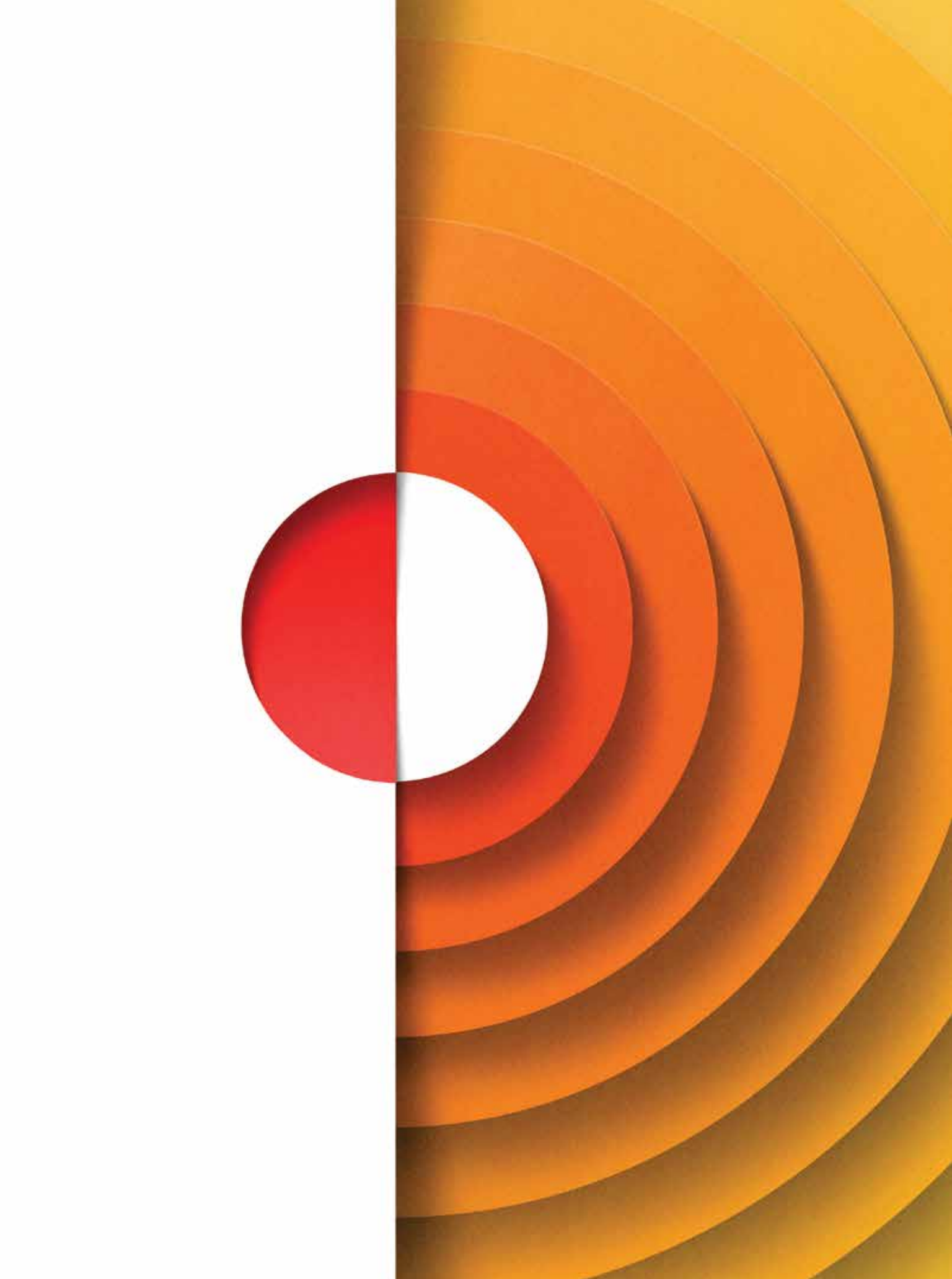
Daniel Susskind

The pursuit of economic growth is one of our most treasured ideas, but it's also one of the most dangerous

One of the few things politicians agree on is that we need more economic growth. Almost every country sputtered into the 21st century: Japan and Germany in the mid-1990s, the United States and United Kingdom in the mid-2000s, China from the mid-2010s. After two decades of successive crises, most economies are sluggish shadows of former selves, and leaders have thrust growth to the top of their priorities.

We have been building up to this moment. Over the past few decades, the pursuit of growth has relentlessly emerged as one of the defining activities of our common life. Our collective success is determined by how much we can produce in a given period. The fortunes of our political leaders depend overwhelmingly on the rise or fall of one number: gross domestic product (GDP).

Illustration by Eiko Ojala



Yet we seldom stop to ask how this all-conquering ascent happened and, most important, whether it's a good thing. Because there's a big problem. When we look at the most serious challenges our planet faces today—from climate change and the destruction of the environment to the creation of powerful technologies like AI whose disruptive effects we cannot yet properly control—growth's fingerprints are everywhere. Yes, it may be one of our most treasured ideas. But it's turning into one of the most dangerous, too.

New obsession

Our obsession with growth gives the impression that it must have an illustrious history, that great thinkers once debated its worth and elevated it to the unrivaled position it now holds. But it does not. It's an extremely new preoccupation. For most of humanity's 300,000-year history, life was stagnant. Whether a Stone Age hunter-gatherer or an 18th century farm laborer, you would have lived a similar economic life, stuck in a relentless struggle for subsistence.

Most classical economists would have found it unimaginable to actively pursue growth as a policy priority. The field's founding fathers—Adam Smith, David Ricardo, John Stuart Mill—all took for granted the prospect of an impending "stationary state" when any period of material flourishing would come to an inevitable end. And even if the idea had occurred to those early thinkers, it would have been impossible in practice: reliable measures of the size of the economy emerged only in the 1940s.

Those classical figures were not alone in neglecting growth. Almost no politician, policymaker, economist—not anyone—talked about the pursuit of growth before the 1950s. So why did the idea of growth, ignored for so long, see a sudden surge in popularity in the mid-20th century? One of the most important reasons was war.

A basic question when waging war is how large a slice of the economic pie can be redirected toward conflict. Yet at the start of World War II, that information was not available. And so in Britain up stepped the great economist John Maynard Keynes to design the first reliable measure, alongside the efforts of an American economist, Simon Kuznets. But GDP is not the same thing as growth: the former is a snapshot of how much the economy produces in a given period; the latter involves increasing that output over time. So how did GDP growth come to matter so much? Again, the answer lies in war—albeit of a different type.

As World War II ended, the Cold War began. There was no grand theater where the main adversaries clashed head-on. None of the numbers of traditional conflict—territory gained, soldiers lost, weapons destroyed—were available to tell who was winning. In their absence, other measures took on significance. The most important was economic: how rapidly the US and Soviet economies were growing.

For the most part, the Cold War was defined by preparation for a grand potential conflict, by the conspicuous accumulation and demonstration of military might. To that end, growth was critical: if a country's economy were larger, it could spend more on the military. At the same time, outgrowing the enemy came to be seen as the definitive way to convince citizens that their side had the upper hand in the broader battle of ideas: the market system versus central planning. An era of "growthmanship" was underway.

Growth dilemma

As the 20th century unfolded, the demands of war faded. Yet the pursuit of growth stubbornly persisted. For growth, it turned out, was also associated with almost every measure of human flourishing. Growth freed billions from the struggle for subsistence, with extreme poverty dropping from 8 in 10 people in 1820 to just 1 in 10 today. It made the average human life longer and healthier—turning obesity, rather than famine, into the rich world's main problem. And it dragged humankind out of ignorance and superstition: 9 in 10 were illiterate in 1820, but 9 in 10 are literate today.

The list of growth's benefits goes on. But politicians and policymakers found it particularly useful. To begin with, it helped pay for grand postwar ambitions: the New Deal, social insurance, five-year plans. Then it promised to make day-to-day politics far easier. Everyone, it seemed, could benefit from it. And growth also made it seemingly possible to escape the conflicts and disagreements that so often plague society. The process becomes, in the words of one economist, "both the pot of gold and the rainbow."

The promise of growth was—and still is—undeniable. But this led to complacency. Political leaders, economists, and many others, blinded by the ways growth appeared to make life better, started to believe that growth was not only good but came at little or no cost. "In the West, although growth has its price," declared one British economist to a gathering of eminent scientists in the early 1960s, "that price may not be so terribly high after all." How wrong that turned out to be.

The relentless pursuit of growth has come at a huge price, with destructive consequences we do not yet fully understand. That price is often put

"Growth does not come from using more and more finite resources, but from discovering more and more productive ways of using those finite resources."

in environmental terms: that we are growing our way toward an ecological catastrophe, that the past eight years have been the hottest eight years in human history, and that climate change is now a climate emergency. But growth is also related to many of the other big concerns people have about the future.

The growth-promoting technologies we have relied on have also been inequality-creating: making humankind more prosperous, but more divided as well. They have been work-threatening and politics-undermining: AI and other technologies are disrupting labor markets and political life in ways it's not clear we can control. And they have been community-disrupting: bolstering some industries but destroying others and decimating traditional sources of shared meaning.

Growth now presents us with a dilemma. It is associated with many of our greatest triumphs, but also many of our greatest problems. The promise of growth pulls us toward pursuing ever more of it, but its price pushes us powerfully away from that chase. It's as if we cannot go on—and yet we must.

Degrowth's folly

The "degrowth" movement proposes a radical response: if growth is the problem, then less growth—or even no growth or negative growth—is the solution. This proposal, which started among a handful of ecologically minded academics a few decades ago, has spread and now draws support from leading environmentalists and activists.

Degrowthers get one thing right: we cannot continue on our current growth path. If anything, environmentalists underestimate the damage growth has done given all the additional problems it presents. That said, degrowthers also make several mistakes.

The movement builds on a misunderstanding of how economic growth really works. The mistake is reflected in the slogan "infinite growth is not possible on a finite planet." But this is wrong—it is possible. The problem is that this way of thinking is rooted in an old-fashioned view of economic activity: one that pictures the economy as a material world where what really matters are the things that can be seen and touched, such as farm equipment or factory machines.

This material focus is a distraction. Growth does not come from using more and more finite resources, but from discovering more and more *productive* ways of using those finite resources. In other words, it comes not from the tangible world of objects, but from the intangible world of ideas. And the universe of those intangible ideas is unimaginably vast: as good as infinite. In other words, our finite planet is not the constraint that matters when thinking about the future of economic growth.

Moreover, degrowth shows us how catastrophic it would be to abandon the pursuit of growth altogether. Freezing GDP per capita at current levels would, as others have noted, require either abandoning 800 million people to extreme poverty or slashing the income of the other 7.1 billion—to say nothing of forgoing all the other benefits of higher living standards.

Powerful ideas

The starting point must be that we need more growth. Without it, we don't stand a chance of meeting our most basic ambitions for society—from eradicating poverty to providing good health care for all—never mind the grander hopes we ought to have for the future. It's deeply unimaginative to believe that the present moment is some sort of economic peak, and that humankind ought to press pause on growth—not simply for the next 10 years, or even 10,000 years, but for all time. So how do we get more growth?

Politicians' confident assuredness when they talk about what's required belies the little we know. Nevertheless, we can draw one critical lesson: growth comes from technological progress, driven by discovering new ideas about the world. Asking, How do we generate more growth? is the same as asking, How do we generate more ideas? In my view, there are four things to be done.

For a start, we must reform our intellectual property regime, which all too often protects the status quo, coddling those who discovered ideas in the past at the expense of those who want to use and reuse them in the future. It is antiquated: the Berne

Convention, for instance, the main international agreement that coordinates copyright law, hasn't changed for over half a century. And it threatens to squander the opportunities of new technologies, like generative AI. It provides too much protection for the material these systems are trained on—and without which they cannot function—and too little for the extraordinary material they create.

Then we must invest far more in R&D, whose trends and levels are discouraging. In France, The Netherlands, and the UK, for example, R&D expenditure as a share of GDP has collapsed since the mid-20th century; in the US, the measure has stagnated at late-1960s levels for decades. Even the efforts of the global leader, Israel, which invests 5.4 percent of GDP in R&D each year, look modest compared with investments made by leading companies: Alphabet, Huawei, and Meta all spend more than 15 percent of their revenue on R&D. A country is not a company, but the contrast reveals something about their priorities. No country can expect a steady stream of new ideas unless it puts serious resources into their discovery.

But we must go further. Reducing inequality and helping people into idea-generating parts of the economy are critical. The US could, for instance, quadruple innovation if racial minorities, women, and children from low-income families invented at the same rate as white men from high-income families. There are many compelling moral arguments against inequality. But from an economic standpoint, it's also just extraordinarily inefficient: a world where some people aren't able to discover and share the ideas they otherwise might is diminished economically as well as culturally.

And finally and most radically, we must use new technologies themselves to help us discover ideas. DeepMind's AlphaFold is a good example. In 2020 it solved the "protein folding" problem and can now calculate the 3D shape of millions of proteins in minutes. (A human researcher would spend their entire PhD to do just one protein.) This will transform our understanding of diseases, and our capacity to treat them, in years to come. We need far more of this technology-based idea discovery.

Existential opportunity

These interventions are our best bet for discovering more ideas and generating more growth. But alone they won't solve the growth dilemma. In fact, simply plowing on in pursuit of more material prosperity at any price will make it worse. We must use every tool at our disposal to change the nature of growth and make it less destructive of the many other things we might value—from a fairer society to a healthier planet.

How might this be done? Consider what has happened with growth and the climate. In 2008 the British economist Nicholas Stern, author of the *Stern Review,* concluded that it would cost 2 percent of GDP to reduce carbon emissions by 80 percent. In short, there was a serious trade-off between growth and the climate: the price for protecting the latter was very high. But by 2020 the UK's Climate Change Committee found that the cost of *eliminating* emissions had fallen to just 0.5 percent of GDP. The trade-off had collapsed. Why? Because the accumulation of two decades of major interventions—taxes and subsidies, rules and regulations, social norms—created a strong incentive for people to develop clean rather than dirty technologies. It ushered in a technological revolution, with a 200-fold fall in the price of solar technology the most striking example.

The practical consequence is that growth is greener than ever. More countries can grow while reducing emissions at the same time. This would have been hard to imagine only 15 years ago. And there is a general insight: by radically reshaping the economic incentives people face, we can not only encourage the development of new technologies to drive growth but also shape the *types* of technologies we develop.

This, then, is the great task of the present: to redirect technological progress toward the other ends we care about—to grow the economy but also make the world fairer, greener, less dependent on disruptive technologies, and more respectful of place. We must do all we can to ensure that the incentives people face do not simply reflect their narrow concerns as consumers in a market but their deeper concerns as citizens in a society.

We live in an age when almost every day brings stories of new existential risks and deflating reminders of our supposed incapacity to deal with them. But I see it differently: we have an existential opportunity.

We have a chance for moral renewal, a way to pay more attention to other valuable ends that we have neglected until now, and a way to achieve that ambition by redirecting technological progress and changing the nature of growth. We have the power to make life better in ways we cannot now imagine. Nothing, in my view, could be more important. F&D

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Creating Value for Taxpayers

Kamya Chandra, Tanushka Vaid, and Pramod Varma

DIGITAL PUBLIC INFRASTRUCTURE CAN DRIVE A SUSTAINABLE INCREASE IN REVENUE COLLECTION AND BUILD TRUST IN GOVERNMENT

Countries all over the world are facing an uphill battle to help citizens protect themselves against economic shocks caused by climate change, global geopolitical fractures, and pandemics while also supporting inclusive and climate-resilient growth. For governments in developing economies, these battles are harder, and the options fewer.

The IMF estimates that low-income developing countries need $3 trillion annually through 2030 to finance their development goals and the climate transition. And with global debt projected to reach 100 percent of GDP before the end of this decade, borrowing to finance these investments may not be the soundest choice. Given that these countries have an untapped tax potential of 8–9 percent of GDP, collecting more revenue through taxation is a better solution.

Yet increasing tax revenue is a major challenge in poorer countries. A large share of the population works

A gardener at Govardhan Ecovillage in Maharashtra, India, in 2022.

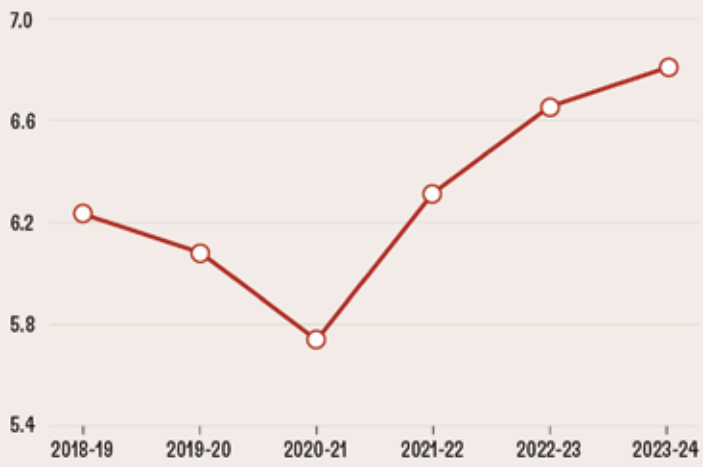
GODONG/UNIVERSAL IMAGES GROUP VIA GETTY IMAGES

CHART 1

Rise in revenue

Monies collected from India's goods and services tax have increased markedly since 2018.

(ratio of gross goods and services tax revenue to GDP, percent)



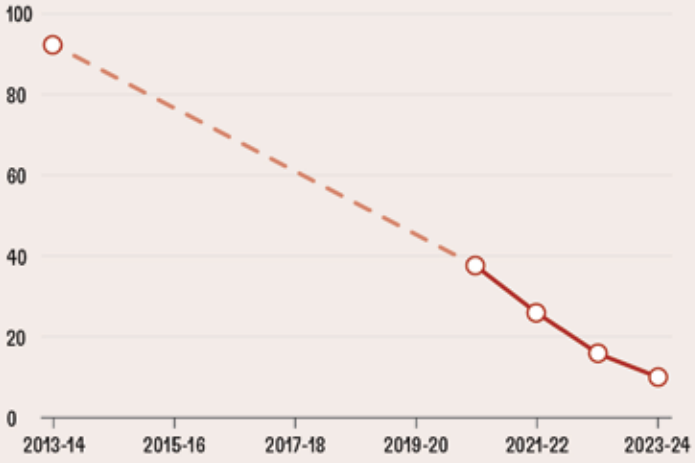
SOURCE: Indian Department of Revenue.
NOTE: The Indian tax year is April 1–March 31.

CHART 2

Increased efficiency

India's adoption of digital public infrastructure has helped reduce the country's income tax return processing time.

(income tax return average processing time, days)



SOURCE: Indian Department of Revenue.
NOTE: The Indian tax year is April 1–March 31.

in difficult-to-tax activities such as small-holder farming and as informal service providers, such as street vendors. It is difficult for the government to track these earnings because they are largely cash-based. These workers often believe that joining the formal sector will only bring them greater tax liability and limited benefits. They prefer to keep businesses small and informal.

To grow their industries, governments often resort to offering tax exemptions to large corporations, which erodes the corporate tax base and strengthens vested interests. Consequently, such countries rely mainly on taxes on goods and services, which place a heavier burden on the poor. Moreover, revenue collection is too often characterized by enforcement that is weak for the rich and punitive for the working class and the poor.

Delivering value

We propose a different and more sustainable approach to increasing domestic revenue in developing economies. This approach is founded on the belief that how governments drive increases in tax collection is integral to how much tax they can collect. The approach is based on strengthening the social contract and encouraging individuals and businesses to formalize their economic activities, with early lessons from India.

A recent World Bank report—supported by funding from the Bill and Melinda Gates Foundation—presents a tax administration framework in which governments augment their efforts to improve enforcement with efforts to build trust by generating social value for their citizens. Generating value as a tax reform strategy is especially important in poorer countries, where trust in tax authorities is limited, compliance is poor, and political support for taxation is low.

The report, "Innovations in Tax Compliance: Building Trust, Navigating Politics, and Tailoring Reform," examines how tax reform has traditionally sought to strengthen enforcement by detecting tax evasion better and imposing higher penalties. It proposes an alternative approach that places greater emphasis on fostering trust between taxpayers and governments by delivering value to people—in other words, taxpayers derive some benefit in exchange for paying taxes. If being part of the formal economy delivers value to individuals, they will be more inclined to formalize their businesses and pay appropriate taxes.

India's case

Well-designed digital public infrastructure can help deliver value and thus drive growth in tax collection, India's experience shows. Digital public infra-

structure is an approach to providing services and economic opportunities to citizens by combining interoperable, open-access, and reusable building blocks into a network of digital systems. It can be compared to roads and other physical infrastructure that connect people and give them access to goods and services. Digital public infrastructure combines innovative technology with strong policy frameworks and incentives for private market participation. Data security, privacy, and consent are at its heart.

Individuals and businesses may resist filing taxes because they see it as a costly compliance burden. Staying out of the system—by using cash for informal transactions or not disclosing assets—is often more convenient than joining the formal economy. Digital public infrastructure can turn this thinking on its head and thereby unlock durable increases in tax collection. We identify three steps that can help governments collect more revenue from and broaden the tax base.

First, introduce digitally verifiable assets and credentials that make it less desirable to operate outside the formal economy and tax system. For instance, Aadhaar, in India, provides unique and verifiable digital identification numbers. Among other things, this has enabled individuals and businesses to open bank accounts. It has also reduced public spending by making social benefit payments seamless. Brazil's Pix, Thailand's PromptPay, and India's Unified Payments Interface make digital payments cheap and effortless. And digitally signed documents and certificates, which are independently verifiable by third parties, can make issuing licenses and permits more straightforward.

Second, align incentives for individuals and businesses to join the formal sector. People should see the process of joining the formal sector as generating value for them, first and foremost. For example, by reducing the cost of business verification, digital payment footprints and verifiable business credentials can help individuals and small and medium enterprises gain access to formal credit at competitive rates. In time, the increased volume of payment records will also lead to more transparent tax collection—but this must be a secondary, not a primary, aim. (For example, if a payment network is launched with the explicit objective of linking all transactions on the network to tax reporting, it could discourage businesses and people from using that infrastructure.)

Third, generate value for individuals and businesses through the tax system. The first two steps make it less beneficial for taxpayers to stay out of the formal tax system. However, countries still

Trust and Taxation

Trust in government and government effectiveness have a reciprocal relationship. Trust is enhanced when political institutions are strong and governments implement policies and initiatives that are aligned with the public interest and improve people's daily lives. And governments can be effective only when their citizens trust them enough to comply with laws, thereby creating the space for reforms.

Of course, trust in government needs more than just robust digital platforms. But the building of India's digital platform infrastructure has laid some of the foundations for increasing trust by creating an inclusive platform for citizens to transact digitally and empowering users to have more control over their data. Good digital infrastructure can create trust between any two counterpart actors by introducing tamper-proof components for identity, payments, and security, which allows citizens and businesses to be certain of the identity of their counterpart and of the legitimacy of the transaction. This allows the reduction in explicit and implicit costs to citizens when they interact with their government, and for businesses in their transactions with individuals, other businesses, and the government.

Trust can also be built in the overall system through other channels, such as the reliability of its functioning or swift and transparent dispute resolution. Countries need to make sustained progress in strengthening digital systems as well as broader policy and institutional frameworks to strengthen trust between citizens and the state. In turn, this will increase confidence in the economy and boost investment, innovation, productivity—and ultimately growth.

"Our approach is based on strengthening the social contract and encouraging individuals and businesses to formalize their economic activities."

need to generate value for businesses to engage with the tax filing system, in particular—which can reward compliant filers in various ways:

Give data back to taxpayers. Data is an asset that should be used confidentially and ethically. It should also be given back to taxpayers in a format they trust, so that they can reuse it to access key services. For instance, in India, the tax collection department provides compliant taxpayers with digitally signed (tamper-proof) business IDs they can use as digital know-your-customer credentials. The tax authorities also designed a public verification mechanism to check core business registration facts associated with a goods and services tax (GST) ID number, helping businesses build trust with prospective partners.

Create incentives for filing taxes throughout the supply chain. Regarding India's GST, the tax department offers businesses an income tax credit discount of up to 20 percent if they purchase goods and services from suppliers also registered and paying tax. This discount applies throughout the supply-chain networks as an incentive for businesses to join the formal tax system. To encourage repeated and timely tax filings, the discount is shared not as cash back but as a credit toward the next tax payment.

Allow the private ecosystem to build seamless filing and value-added services. Opening up use of application programming interfaces (APIs) in the tax system would allow private innovators to build unique digital and physical user experiences for tax filing that combine services and save time for filers. This is a market incentive for private competition based on ease of filing that caters to diverse user needs and drives digitalization. Since the Indian government opened API access, more than 55 licensed third-party platforms have been used to file taxes.

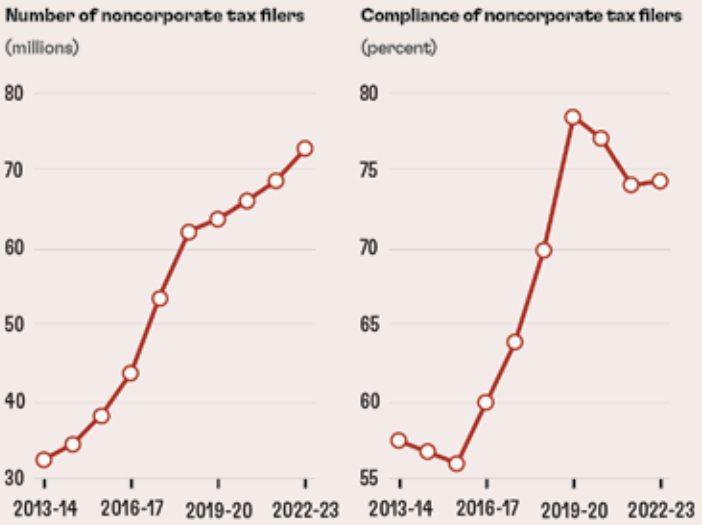
'Value-first' lens

India has successfully leveraged digital public infrastructure—revenue collection via the goods and services tax has grown by more than 50 basis points of GDP since 2018, showing a marked increase over projected collections under the previous tax regime (see Chart 1). The time it takes to process electronic returns and refunds for taxpayers has fallen significantly (see Chart 2). And the tax base has broadened, with a marked and sustained rise in noncorporate taxpayers, including small businesses and individuals (see Chart 3). A crucial element of India's digital success is the system's robust security and privacy controls, which ensure that the government uses taxpayer data confidentially and ethically.

CHART 3

Broader, deeper tax base

Thanks to digital public infrastructure, India has increased its base of small business and individual taxpayers.



SOURCE: Indian Department of Revenue.
NOTE: The Indian tax year is April 1–March 31.

Improvements in revenue collection cannot, however, be attributed to technology alone. Governance and policy reforms are also critical. For instance, India set up the Goods and Services Tax Network as a unified collection mechanism intended to simplify tax compliance and administration for businesses of all sizes.

In summary, sustainable increases in revenue mobilization result when governments' systems and processes provide value to people and businesses, and tax collection increases gradually over time as a derivative benefit. As digital transactions become an integral part of business and life, it is more difficult for people to evade the system. Moving from an enforcement-of-collection lens to a value-first lens is a promising new way to drive lasting increases in revenue collection and encourage a more trusted social contract between individuals and the government. F&D

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Kalpana Kochhar and Sanjay Jain of the Bill and Melinda Gates Foundation contributed to this article.

The Sahel's Intertwined Challenges

Gilles O. Yabi

INSECURITY, TURBULENT POLITICS, AND WEAK INSTITUTIONS STYMIE PROSPECTS FOR SHARED ECONOMIC PROGRESS

Without an analysis of power, it is hard to understand inequality or much else in modern capitalism," Angus Deaton writes in the March issue of *Finance & Development*. Deaton's thinking is equally relevant for some of the world's most impoverished countries, notably in West Africa. Without analyzing political power and how it interacts with other forms of power, it is impossible to understand the economic trajectories of West African countries and the extreme fragility and uncertainty that pervade security and politics in much of the region.

Political instability and insecurity

The central Sahel region has attracted special attention as several non-state armed groups, including terrorists, have taken root over the past dozen years. According to the 2024 Global Terrorism Index, Burkina Faso, Mali, and Niger are among the 10 countries most affected by terrorism worldwide.

These three countries experienced military coups between 2020 and 2023. Mali went through a two-stage putsch in September 2020 and April 2021, which launched a new phase in its long political and security crises that began in 2012. Burkina Faso followed in 2022, with a coup in January and another in September. In Niger, there was a coup in July 2023, even though the security situation was much less serious than it had been in Mali and Burkina Faso.

Some of the military officers who seized power may have been motivated, at least partly, by a sincere desire to improve the security situation—but others may have been attracted by power and privilege. Officers were able to take advantage of the widespread popular frustration with the deteriorating security situation, as well as the lack of economic and social progress under the country's democratically elected leaders. The inability of elected civilian governments to stem the loss of effective control over large swaths of national territory, in Mali and Burkina Faso in particular, handed the military the perfect pretext for seizing political power. Even beyond the individuals who currently hold the reins of government, armies are bound to exert a strong influence on political power in this region for several years to come.

A decade of crises in the Sahel has already taken a very heavy toll, particularly through lost educational opportunities. The current cohort of adolescents and children has gained little in the way of knowledge and life skills given school closures, internal displacements, and worsening family destitution—and these young people risk becoming involved in crime and terrorism. The worsening daily living conditions can only prolong the region's security and political crises, and accentuate its fragilities.

History matters

Although the situation in the Sahel has deteriorated dramatically since 2012, the fragility of Mali, Burkina Faso, and Niger is directly linked to the challenge of building countries—including their political, economic, and social institutions—that were shaped by the legacy of French colonization.

In addition to the lasting legacy of colonization, the Sahelian countries share their youth as independent states within their current borders. The work of building political institutions that inspire confidence among the people of countries with great ethnic, cultural, and linguistic diversity is only a few decades old and has had varying degrees of success.

Moreover, the economic and financial crises of the late 1980s and 1990s, followed by a period of macroeconomic stabilization and structural adjustment in the region, dealt a severe blow to efforts to build capable states by significantly reducing their capacity to act and making them dependent on international institutions. Multiparty systems and competitive elections have returned in several countries. But democratization processes were fragile, and constitutional provisions did not always materialize in political practice.

PREVIOUS SPREAD: PHOTO BY FLORENT VERGNES/AFP VIA GETTY IMAGES

The boundaries and any other information shown on the map do not imply, on the part of the IMF, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

The prisons of power

In an article on the political economy in Niger published in 2015, the French-Nigerien anthropologist Jean-Pierre Olivier de Sardan theorizes about why countries fall into this trap of weak governance and instability. He identifies "prisons of power" with four main gatekeepers: big business; political party militants, allies, and courtiers; bureaucrats; and international experts.

"Whoever comes to power must satisfy the demands of numerous interest groups," Olivier de Sardan writes. "The elected president allocates ministries to the parties that helped elect him, the ministers must in turn distribute posts to activists, and the latter will also find small rewards for other activists in the form of service provision or small supply contracts."

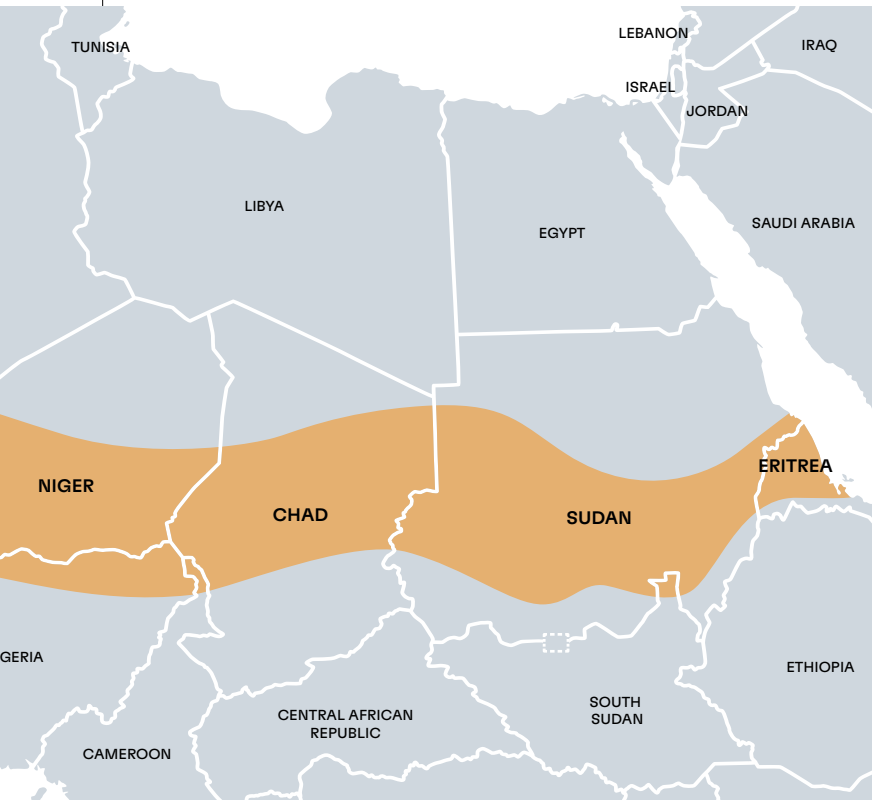
Business executives who yield political influence are seeking a return on their investment in the form of protection, tax exemptions, key government jobs for allies, and contracts awarded. They are thus at the heart of systemic corruption, which is directly linked to the ever increasing cost of election campaigns in a context of widespread poverty.

Olivier de Sardan also explains how international experts and the international aid system are part of this political economy, which has been nurturing inefficient public policies and disappointing economic results. "The aid system, whether project aid, sectoral aid, or budget aid (the three remain intertwined), induces an unhealthy and paralyzing dependence," he writes.

These links between political practices, state functions, public services, and living conditions are not unique to the Sahel. They are present in most countries in West Africa and beyond—although the scale and sophistication of the capture of institutions and economic opportunities by interest groups vary. Security crises, in part the result of limited success in building institutions and developing the economy, add a further layer of complexity.

PETERHERMESFURIAN

Previous spread: A wholesale trader takes inventory of his stock in Bamako, Mali, in February 2022 following West African sanctions.



Investing in institutions and people

Curbing state capture by a few groups that abuse their proximity to those with political power calls for improving institutions by fostering efficiency and integrity. The actions proposed by the West Africa Citizen Think Tank (WATHI), which I lead, include strengthening institutions that control the use of public resources and combating corruption while institutionalizing citizen participation in public policy debate as an essential component of democratic governance. We also recommend a deliberate institutional approach aimed at reducing spatial inequalities within countries by monitoring progress in the delivery of public services.

Helping stabilize the countries of the Sahel is essential for sustainable economic development across a vast swath of the African continent. Despite the effects of the COVID-19 pandemic and the war in Ukraine, several West African countries (for example, Benin, Côte d'Ivoire, and Senegal) have achieved remarkable economic growth in recent years. Nonetheless, continued growth depends on maintaining security in their territories and on the perception of risk, which is affected by the situation in the Sahel.

International financial institutions must take the local context and adverse effects of externally driven interventions more seriously, especially in the Sahel. In particular, such institutions need to work with countries in the region to prioritize investing in and reforming education and vocational training. This will help stimulate local economies based on crop production, raising livestock, and small-scale natural resource processing.

Throughout West Africa, sustainable economic and social progress—not to be confused with short-term economic growth—depends on refocusing efforts toward building institutions and investing in people. **F&D**

GILLES O. YABI *is founder and CEO of WATHI, the West African Citizen Think Tank, and a nonresident scholar with the Carnegie Endowment for International Peace Africa Program.*

Emerging Markets on the Global Stage

Aqib Aslam and Petya Koeva Brooks

EMERGING MARKETS HOLD BOTH THE REINS OF FUTURE GROWTH AND THE KEYS TO THE FUTURE OF MULTILATERALISM

As advanced economies turn increasingly inward, emerging markets have an important stake in the defense against global economic fragmentation.

Having grown in both size and global economic stature—on the back of greater integration and hard-won reforms—emerging markets are not only a permanent fixture on the global economic stage but also expected to be natural champions of the multilateral approach.

Given their expanded global footprint, it might seem unusual that the concept of "emerging markets" is still in use. Until 1980, the IMF divided economies into two groups: a small clutch of "grown-up" wealthy, capital-rich "industrial countries" and a majority of "still-growing" poorer, labor-rich "developing countries." In 1981, an enterprising employee at the International Finance Corporation, Antoine van Agtmael, devised the term "emerging market" to drum up interest in a new equity fund of 10 up-and-coming developing economies.

This label—evoking dynamism, potential, and promise—stuck. And it spawned a distinct asset class and numerous indices—such as the MSCI Emerging Markets Equity Index, introduced in 1988, and JP Morgan's Emerging Markets Bond Index, created in 1991. These socialized investors to the new middle children of the global economy as they navigated growing pains and external shocks and faced currency crises, financial contagion, sudden stops, and growth accelerations.

However, many emerging markets are outgrowing both the term and the stereotype, given their global influence and greater policy credibility and sophistication. This raises questions: What does it take for markets to have finally emerged? And does it have any bearing on their place in the global economy?

Greater global sway

Perceptions of emerging markets are inevitably anchored in their economic and political origin stories, which are not only relatively turbulent but also more recent. Following the turmoil of the 1970s and 1980s, China's accession to the World Trade Organization in 2001 ushered in a period

Traffic circles the Hotel Indonesia roundabout at night in Jakarta in July 2019.

SHUTTERSTOCK/AQWAM HIZBAL MUHSHIY

of remarkable growth for emerging markets, until the global financial crisis. China's development accelerated globalization and unleashed a commodity supercycle, which lifted global activity and enriched commodity-exporting emerging markets.

The tables turned after 2010 for emerging markets—notably commodity exporters. In China alone, annual GDP growth slowed by 4.6 percentage points between 2010 and 2019 and is expected to decelerate to just over 3 percent by 2029. Add to this the global fallout from the pandemic, fresh conflicts, commodity price shocks, the retrenchment of global capital, and escalating geopolitical tensions.

However, emerging markets are not the unwilling hostages to global developments they once were. On the contrary, recent IMF research highlights how emerging markets now are increasingly influential both locally and globally. Growth spillovers from domestic shocks in these economies have not only increased over the past two decades but are now comparable to those from advanced economies.

As a result, emerging markets are very much in the driver's seat when it comes to global growth—both the highs and the lows. The performance of emerging market members of the Group of Twenty (G20) accounted for almost two-thirds of global growth last year. Fading prospects for these same economies have also driven more than half of the almost 2 percentage point decline in medium-term growth prospects since the global financial crisis. This weight will likely only increase.

Furthermore, despite China's continued global economic heft, emerging markets are increasingly less reliant on its prospects. Their recent resilience can also be traced to an overall improvement in fundamentals—for instance, improved current account balances, lower dollar-denominated debt, and higher reserves—and better monetary and fiscal policy frameworks. And with the climate transition highlighting the gap between demand and supply for critical minerals such as copper and nickel, trade fragmentation and postpandemic diversification mean that the importance of emerging markets in global supply chains is set to grow.

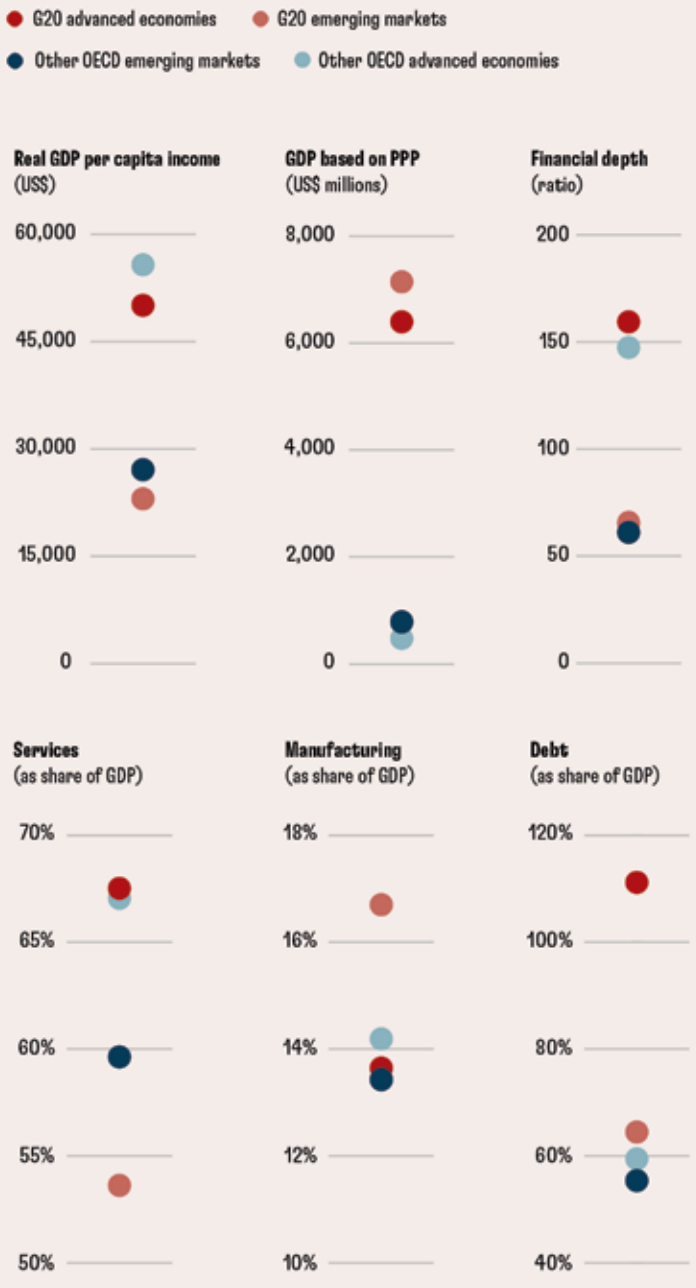
Converging to advanced

Despite their expanding global influence and the increases in incomes and wealth they have secured for their populations, graduation to the "*A*(dvanced)-*list*" has remained elusive for all but a handful of emerging markets. To be an emerging market is to be left waiting with no clear end to the (emergence) process and somewhat overlooked on the global stage.

CHART 1

Global standings

Emerging markets are now larger than advanced economies in purchasing-power-parity terms but remain differentiated by other measures.



SOURCES: Penn World Tables 10.01; World Bank, Global Financial Development Database; World Bank, World Development Indicators; IMF, *World Economic Outlook*; and IMF staff calculations.

NOTE: Advanced economies based on IMF definition. Emerging markets are members of the Group of Twenty (G20) and Organisation for Economic Co-operation and Development (OECD) not defined as advanced economies. Dots show simple unweighted averages for each group. Data where available are from 2023; financial depth is measured using liquid liabilities as a share of GDP as of 2021; debt is gross general government debt; PPP = purchasing power parity.

The IMF added "advanced economy" to its lexicon in the May 1997 *World Economic Outlook*. It grouped the four newly industrialized economies in East Asia and Israel with the existing 23 "industrial countries" of the time, based loosely on comparable per capita income levels, well-developed financial markets, a high degree of financial intermediation, diversified economic structures with relatively large and rapidly growing service sectors, and a declining share of employment in manufacturing. Since then, only 13 more economies have joined their ranks—all from Europe, except for Macao SAR and Puerto Rico—while the group as a whole has seen its share of global activity decline from 75 percent to 60 percent.

How did these countries make it? Two paradigms emerge. The first is that of the "Asian Tigers," which pursued rapid export-oriented industrialization—as in Japan—through state intervention to develop comparative advantages in certain sectors (such as textiles in Hong Kong SAR and heavy and chemical industries in Korea). The second is the central and eastern European example of broad institutional reforms anchored by accession to the European Union and foreign capital inflows. In that setting, the extra step of joining the euro area by meeting the four economic convergence criteria also guaranteed an automatic invite to the *A-list*.

And here's the problem (in both cases): to have emerged is to have *converged*. To do so—even by building comparative advantage in just one link of global value chains—requires large amounts of capital either from domestic or foreign savings, underpinned by a coherent policy framework that can survive the political cycle. In theory, emerging market and developing economies should be a magnet for external flows, as their smaller capital bases and strong growth potential translate into attractive real returns. In practice, we have the so-called Lucas paradox, the observation that capital does not flow from rich to poor countries. Instead, convergence requires funding domestically, unless there are Marshall Plan–scale capital injections at hand. As the latter are not so easy to come by, many emerging market and developing economies are at the mercy of fickle international capital flows amid weak governance and underdeveloped financial systems.

"Emerging markets are not the hostages to global developments they once were."

Multilateral mantle

But even if emerging markets still fall short of advanced economy standards, carving up economies into these two categories seems increasingly irrelevant in recent years. The growing depth of emerging markets' integration into the global economy and their sheer size—both in terms of GDP and population—and diversity mean they are now just as significant and just as systemic as most advanced economies. That several advanced economies are reverting to inward-looking policies reinforces this prerogative: emerging markets are no longer bystanders but have a vested interest in the success of the multilateral approach. After all, globalization, cooperation, and the uninterrupted flow of goods, services, capital, and know-how have been—and will remain—instrumental to their growth, productivity, innovation, and poverty reduction.

Of course, some of the largest emerging markets have already been exercising their global economic rights as part of the G20—the only capital G group of countries indifferent to the emerging-advanced dichotomy. With 7 of the 10 recent presidencies held by emerging markets—with South Africa set to take up the torch in 2025—they have been able to promote issues they see as domestic and global macro-critical priorities: for example, inclusivity and investment (Türkiye 2015); innovation and technology diffusion (China 2016); the future of work, infrastructure, and sustainable food (Argentina 2018); female and youth empowerment (Saudi Arabia 2020); productivity and resilience (Indonesia 2022); green development and digital public infrastructure (India 2023); and inequality, revenue mobilization, and global governance (Brazil 2024).

However, just as emerging markets are stepping up, so too must international organizations engage further with them in the global interest. The IMF, for instance, must continue to tailor policy advice to country-specific circumstances. This requires even greater understanding of emerging markets and stronger expertise in their issues. The IMF must also review its resources and lending facilities—active and precautionary, financial and nonfinancial—to ensure an adequately funded global financial safety net and a suite of fit-for-purpose tools for systemically important emerging markets. And their growing importance should be legitimized in global governance.

Despite the label, emerging markets are now at the heart of global policymaking and global growth. At a time of growing uncertainty over the global economic environment and increasingly selective policies, international organizations can lean more heavily on these natural allies, which have a growing stake in keeping the flame of multilateralism lit, to overcome the immense global challenges we face. F&D

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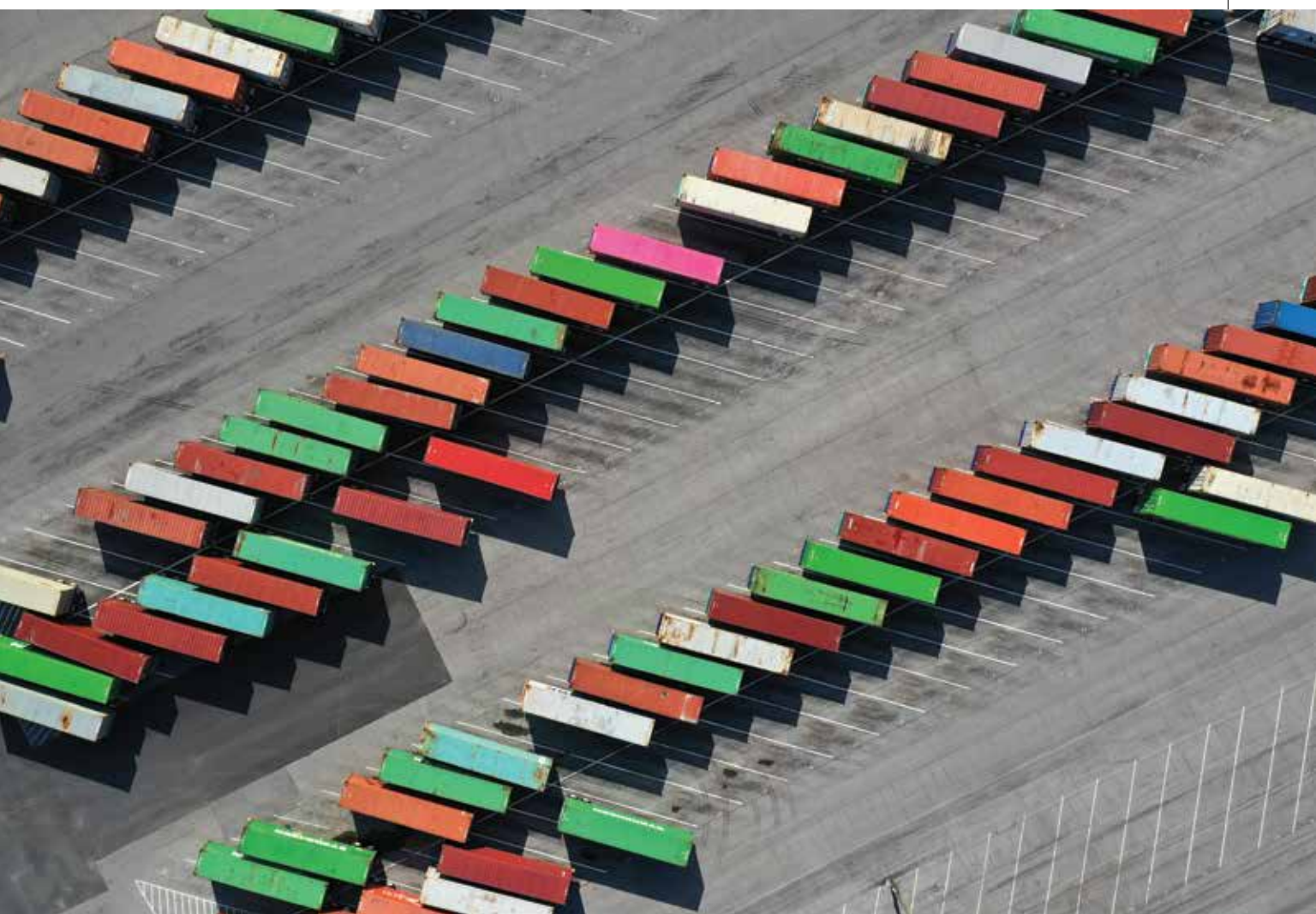
Inflation's Rise and Fall

Mai Chi Dao, Daniel Leigh, and Prachi Mishra

RECENT PRICE SWINGS REFLECTED LARGELY ENERGY- AND SUPPLY-RELATED SHOCKS RATHER THAN MACROECONOMIC OVERHEATING



As inflation began to rise in 2021, most policymakers and analysts predicted that the increase would be neither particularly large nor persistent. But by 2022, inflation had become an acute problem for central bankers. Then, after some of the sharpest and most synchronized monetary policy tightening on record, world inflation ebbed almost as suddenly as it had risen.

We see two broad explanations. The first stresses that inflation rose at the same time in most countries because they were subjected—to varying degrees—to a similar sequence of shocks: the pandemic, mobility restrictions, and associated economic policy measures, especially the extent of fiscal and monetary support. This emphasizes domestic drivers. More fiscal and monetary support, tighter labor markets, or less-well-anchored inflation expectations would translate into higher inflation.

The second stresses that inflation rose everywhere at the same time, not because local shocks were identical across countries, but because global causes were at play. The surge in energy and food prices, intensified by Russia's invasion of Ukraine, triggered an energy crisis akin to the 1970s oil shocks. Geopolitics was the cause of both series of events. And it's true that global energy prices and headline inflation rose together even as long-term inflation expectations held steady (see Chart 1).

Our recent research (Dao and others, forthcoming) covering 21 advanced and emerging market economies sheds light on these competing explanations by decomposing headline consumer price inflation into underlying (core) inflation and headline shocks—deviations of headline from core inflation. We explain core inflation by long-term inflation expectations and broad measures of macroeconomic slack, such as the unemployment rate, the output gap, or the ratio of vacancies to unemployment. We explain headline inflation shocks by large price changes in particular industries, such as food, energy, or shipping, and by measures of supply-chain disruptions. We also allow for the pass-through over time from these industry price shocks to core inflation, which can occur through the effects of headline inflation on wages and other production costs.

Putting the different pieces together, we estimate the respective contributions of headline shocks, their pass-through into core inflation, broader measures of macroeconomic slack, and changes in long-term expectations to the rise and fall of inflation across countries.

CHART 1

Stable expectations

Long-term inflation expectations held steady despite a surge in energy prices and headline inflation.

(percent; median across countries)

SOURCES: Haver Analytics; and authors' calculations.

NOTE: Energy price inflation is based on consumer price index for energy; long-term expectations are based on assessments of professional forecasters.

CHART 2

Shocks and effects

Inflation's rise and fall reflected mainly shocks to prices in particular industries and their pass-through rather than macroeconomic slack.

(percentage points; 12-month rate)

SOURCES: Haver Analytics; and authors' calculations.

NOTE: Chart decomposes rise in headline inflation from December 2020 to the country-specific peak (left panel) and change from the peak to the latest observation included in the study (March 2024).

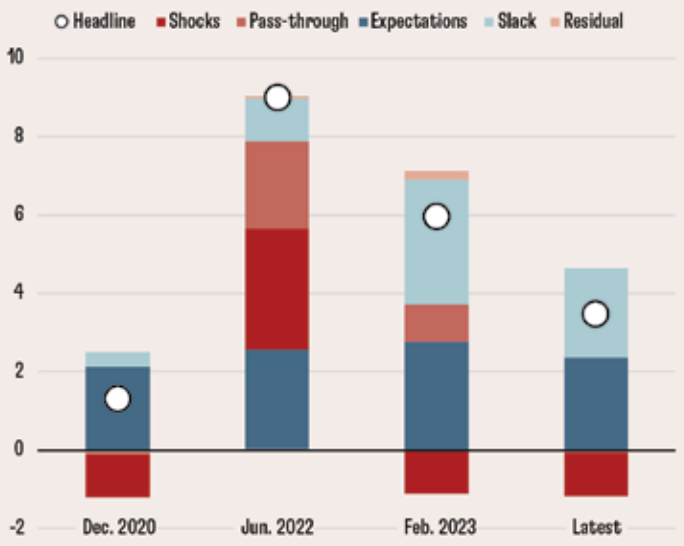
WIN MCNAMEE/GETTY IMAGES

CHART 3

US exception

In the United States, macroeconomic strength played a larger role than elsewhere in keeping inflation above target.

(percentage points; 12-month rate)



SOURCES: Haver Analytics; and authors' calculations.

"Inflation's rise and fall reflected primarily global drivers, but local circumstances mattered too."

Overall, we find that headline shocks and their pass-through into core inflation account for most of the rise and fall of inflation. Broader measures of macroeconomic slack and changes in longer-term inflation expectations generally contribute little (see Chart 2).

The United States is a significant exception. The contribution of broad macroeconomic tightness to inflation remains greater than in other economies despite the significant cooling of the labor market since early 2023. The fall in US headline inflation since February 2023 reflects equally the cooling of the broader economy and the fading pass-through from earlier headline shocks (see Chart 3).

The bottom line is that inflation's rise and fall reflected primarily global drivers, but local circumstances mattered too. We find, for example, that differences in local energy price policies, including subsidies for people and businesses, explain differences in the role of energy price shocks in driving inflation. France, for instance, had large price-suppressing fiscal measures and a relatively small contribution of energy to headline inflation shocks.

Monetary policy also played a critical role in defeating inflation. Throughout this period, long-term inflation expectations remained well anchored. This suggests that central banks retained credibility and that this helped prevent wage-price spirals. Global tightening of monetary policy may also have helped bring down global demand and hence energy prices. At the same time, energy shocks and their pass-through, as well as their reversal, account for the bulk of the rise and fall of inflation, without the need for a deep economic slowdown. Even so, in the case of the United States, strong macroeconomic conditions have been a more important contributor to core inflation than in other countries. Since March 2024, when our sample ends, US labor market conditions have further moderated, and this should help inflation return to target. F&D

Previous spread: Trailers sit idle at a Virginia Inland Port facility in October 2021.

MAI CHI DAO *is a deputy division chief in the IMF's Western Hemisphere Department, where* **DANIEL LEIGH** *is an advisor.* **PRACHI MISHRA** *is a professor of economics at Ashoka University and head of the Ashoka Isaac Center for Public Policy.* **PIERRE-OLIVIER GOURINCHAS**, *the IMF's economic counsellor and director of the Research Department, contributed to this article, which draws on "Understanding the International Rise and Fall of Inflation Since 2020," a paper by Dao, Gourinchas, Leigh, and Mishra that is forthcoming in the* Journal of Monetary Economics.

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People in Economics

Scourge of the Rich

Prakash Loungani profiles Berkeley's **Gabriel Zucman**, a strong advocate for higher taxes on the most affluent

IN 2012 THE FAMOUS FRENCH ACTOR GÉRARD DEPARDIEU moved his home across the border to Belgium to avoid paying a hefty surtax on incomes over 1 million euros. The ease with which Depardieu avoided taxes made international news. A young French economist named Gabriel Zucman followed the events with avid interest, as he had recently written his master's thesis at the Paris School of Economics (PSE) on how tax rates affect flight by the superrich.

Fast-forward to July 2024, when the Group of 20 countries (G20) discussed a proposal for a global minimum tax on the world's 3,000 billionaires. Coordination across countries would ensure that the superrich could not simply pull a Depardieu by fleeing to a different country. The blueprint for the G20 proposal was drawn up by a still-young Gabriel Zucman.

In the less than two decades since his master's thesis, the 37-year-old Zucman has established himself as one of the world's leading experts on measuring incomes and wealth, and on how—and how much—to tax very rich people and corporations. "We have to fix the mistakes we've made in taxing the superrich, not simply throw up our hands and give them a free pass," Zucman told F&D.

"We have to fix the mistakes we've made in taxing the superrich, not simply throw up our hands and give them a free pass," Zucman tells F&D.

Political trauma

Zucman grew up in comfortable circumstances in Paris, the child of two doctors. He attended prestigious schools for his undergraduate education. What turned this scion of the rich into its scourge? One event was the 2002 election in France, when right-wing leader Jean-Marie Le Pen reached the final round of the presidential race; Zucman has described it as the "traumatic political event of my youth." Appalled by Le Pen's views and proposed policies, he says his political thinking was shaped by the desire to keep "this disaster from happening again."

In an early sign of the thrust of his career, in 2006 Zucman launched a journal to help "economists establish a dialogue with other social sciences, like political science and sociology, and to connect their work to policy debates." *Regards croisés sur l'économie*, which is still published today, has helped inform debates in France and elsewhere on taxation and other issues.

In 2008, Zucman finished his master's thesis at PSE on flight from French wealth taxes, supervised by noted economist Thomas Piketty. Unsure about continued academic study, he began work at a French brokerage company, Exane, coincidentally on the same day that Lehman Brothers went bankrupt. His experience in the financial industry, where he worked with data showing vast international capital flows to small jurisdictions, triggered his interest in tax havens. "Realizing the magnitude of offshore wealth and the extent of tax evasion radicalized me," Zucman told F&D. It also convinced him that analyzing data and policy issues required solid training in economics. He returned to PSE and by 2013 had completed his PhD, again supervised by Piketty.

Zucman's PhD work, however, did not fit the mold of a traditional economics dissertation, according to Emmanuel Saez, a professor at Berkeley and a mentor and frequent collaborator of Zucman's. A couple of its chapters were devoted to measuring the wealth hidden in tax havens and how best to counter such evasion. A third chapter, written jointly with Piketty, constructed new historical series of capital income and wealth for many countries. This chapter formed the backbone of Piketty's 2014 blockbuster book *Capital in the Twenty-First Century*, says Saez.

These two themes—measuring tax evasion and the wealth of the very rich—have been carried forward in most of his subsequent work. What makes Zucman stand out is that he combines attention to novel data sources with "great concern for the big picture," says Piketty.

Hidden wealth of nations

In 1975, when the *Economist* magazine's bookshop in London first offered a book titled *Tax Havens and Their Uses,* by Caroline Doggart, a line of customers several blocks long formed outside to buy it. It reflected a time when airline magazines carried ads from tax planners offering various evasion schemes. This tolerant attitude toward tax evasion started to change in the 1990s as countries saw they were losing tax revenue to financial centers that attracted the wealth of the superrich, with scant scrutiny of their activities.

Even with the changed attitude, figuring out the extent of wealth hidden in tax havens was difficult. Zucman's 2013 thesis chapters were among pioneering efforts during the 2010s to fill this "daunting" data gap, according to Gian Maria Milesi-Ferretti of the Brookings Institution. The increased scrutiny led some financial centers to release information on bank deposits held by foreigners from various countries. In a 2018 paper, Zucman and his coauthors pounced on this data to provide some estimates on how the wealth hidden in tax havens varied across countries. For Scandinavian countries, offshore wealth amounted to only a few percent of their incomes, but the figure rose to 15 percent for continental Europe and to 60 percent for Russia, the Gulf countries, and some Latin American countries.

Zucman's next breakthrough came because of data leaks—the Panama Papers and HSBC Swiss Leaks—and the results of tax amnesties. Merging this information with countries' tax records, Zucman and his coauthors were able to show, in a 2019 paper, what everyone suspected: the people with offshore wealth were the superrich people in their countries. Their estimates, which were for Scandinavian countries, found that 90 percent of offshore wealth belonged to people in the top 1 percent of the income distribution; the top 0.01 percent held 50 percent of all offshore wealth. Zucman's work has also found that the rich evade taxes much more than conventional audits suggest. In Scandinavian countries, the top 0.01 percent evade about 25 percent of their taxes, compared with only 5 percent identified by audits.

Hidden wealth of companies

It's not just rich people who try to escape taxes, rich companies do it too. Like billionaires skipping countries, multinational corporations (MNCs) can report profits in low-tax jurisdictions, lowering their overall tax burden. MNCs employ complicated strategies

"Zucman grew up in comfortable circumstances in Paris, the child of two doctors. What turned this scion of the rich into its scourge?"

to carry out this tax avoidance, making it difficult to trace it and estimate its magnitude. But Zucman's work "has made strong inroads into measuring some of this MNC activity," Milesi-Ferretti told F&D.

Zucman has shown that, in the 2010s, between 30 and 40 percent of the foreign profits of MNCs were reported in tax havens. Moreover, MNCs claim that their operations in tax havens are far more profitable than what local firms report in those same locations, and these high profits are mysteriously generated with limited amounts of capital and labor. For instance, US MNCs are able to generate half of their reported profits in tax havens, but only 10 percent of their foreign wage bill goes to workers in these same economies.

Such findings are starting to lay bare what people have long suspected but couldn't prove: the profits reported in tax havens are not the result of genuine economic activities by MNCs but rather inflated paper profits. Thanks to Zucman's work, policymakers are finally admitting that the "reality of tax competition is that countries compete to become the financial home of paper profits," Saez has written.

Things may be starting to change. Countries around the world, including tax havens, have now agreed to common standards for reporting the wealth of their foreign clients to the tax authorities of home countries. And in October 2021, over 130 countries signed on to a proposal for a global 15 percent minimum tax on multinationals; this development "in part is inspired by Gabriel's work," Saez told F&D.

Top-heavy

The other major strand of Zucman's research, building on the third chapter of his dissertation, is the measurement of how much income and wealth go to the very top. With Piketty, Zucman has estimated that the share of US income going to the richest 1 percent of households has doubled from less than 10 percent in the 1970s to 20 percent today. And since 1980, the bottom half of the US population has seen hardly any income gains in inflation-adjusted terms, though low-income groups have benefited from increased in-kind support, such as Medicaid. Income disparities are also reflected in increased wealth concentration. Saez and Zucman have found that the wealth share of the richest 1 percent of US households had increased from about 25 percent in 1980 to about 40 percent in recent years.

Zucman's work runs counter to the dominant thrust of economics, which focuses on efficiency—growing the size of the pie—rather than on equity, worrying about the size of the slices going to various people. The narrative in mainstream economics is that markets reward people according to the contributions they make. Tinkering with this allocation is unfair and counterproductive: it risks discouraging hard work and entrepreneurship, reducing the size of everyone's slice, rich or poor.

Zucman takes a very different view. "No one becomes a billionaire without public support and society's contribution," he says. Deciding how much to tax the rich should "be up to society and democratic deliberations." He also notes that the schemes under serious consideration for taxing the superrich are fairly modest and not likely to discourage their effort. "If implemented, they would ensure that billionaires pay the same share of their income in taxes as teachers and firefighters; this is hardly punitive."

Acrimony and awards

Given the extent of its departure from the norm, it is not surprising that Zucman's work has drawn more than its fair share of criticism. In 2019, two US Treasury economists claimed that, instead of increasing sharply as claimed by Zucman, the income share of the country's top 1 percent had not changed much since the 1960s. The dispute centers on assumptions about how to allocate "unobserved" income (the difference between national income and the income observable in tax returns), much of which is untaxed business and capital income. Zucman and his coauthors have defended their assumptions, arguing that it is the Treasury authors who "erroneously allocate a large and growing amount of untaxed business and capital income to the bottom of the distribution."

Zucman's estimates of US wealth concentration have also generated controversy. In 2018, they were the basis for a claim by presidential candidate Elizabeth Warren that the wealth tax she was proposing would raise $2.75 trillion over a decade, paid by the 75,000 richest American families (less than 0.1 percent of the population). Former US Treasury Secretary Larry Summers wrote an op-ed in the *Washington Post* claiming that the revenue estimates were greatly exaggerated. Zucman and coauthor Saez have defended their position, noting that their estimates of wealth concentration are "not contested" by Summers; "where views differ is on the scale of tax avoidance" from a wealth tax.

In June 2019, the controversies proved sufficient for Harvard's president to veto a decision by the university's Kennedy School of Government to hire Zucman. Despite his critical op-ed, Summers "regards Mr. Zucman as highly talented, and was among the economists who argued strongly in favor of his hiring at Harvard," the *New York Times* reported. Zucman himself shrugged off Harvard's decision, saying that it "should not discourage young scholars … to publicly defend new ideas."

Since then, the economics profession has also very clearly expressed its view on the value of Zucman's work. He had already been awarded, in 2018, France's top prize for a young economist. In 2023, he received the John Bates Clark Medal, the profession's top award outside of the Nobel Prize. The medal is awarded to young economists and has proved to be a good predictor of a future Nobel. Saez, himself a recipient of the Clark Medal, says that Zucman has shown a path for economists—"careful measurement that is not wedded to a specific theory. He has inspired many young scholars to follow in his footsteps." F&D

PRAKASH LOUNGANI *is the director of the applied economics master's program at Johns Hopkins University.*

Café Economics

Worry-Free Retirement

As life expectancy increases, **Olivia S. Mitchell** says it takes financial planning to take the worry out of extra retirement years

Career paths are rarely straight lines, but as new technologies transform jobs at a dizzying pace the twists and turns can throw retirement plans off course. Born to globe-trotting economist parents, Olivia S. Mitchell was introduced to economic principles early on. At the age of five, while living in Pakistan, she observed construction workers pouring concrete by bucket brigade rather than using a cement truck and asked her father why. "Labor is cheaper than capital," he responded. Mitchell went on to study economics at Harvard and the University of Wisconsin–Madison, with a focus on public economics and development. She has published hundreds of highly regarded research papers and books on the topic and is considered a founder of modern academic pension research.

We are living longer and healthier lives, but families and society will have to care for a larger number of frail elderly people.

Mitchell, professor of business economics and executive director of the Pension Research Council at the University of Pennsylvania's Wharton School, spoke with F&D contributor Rhoda Metcalfe about how supporting healthy aging and improving financial literacy will help society reap the benefits of longer lives.

F&D: What's the situation for people heading into retirement today compared with past generations?

OM: In the United States 30 or 40 years ago, my parents' generation faced a strong economy. They had what they believed to be a reliable retiree medical and social security system, and many of them were fortunate to experience a big run-up in housing prices. So when they reached retirement, they were doing relatively well.

Today's retirees are not necessarily in such great shape. We know that the US and many countries around the world are experiencing falling fertility and rising longevity. This means that our populations are aging much more rapidly. Social Security, which is the first pillar of US retirement security, will run short within 10 years. So the reality is that longevity comes with a silver dividend. We get to live longer, many of us will live healthier, but families and society will have to care for a larger number of frail elderly people.

Economic growth around the world is also likely to slow as older folks start to draw down their assets. The global balance of power will shift from older, richer developed economies toward the emerging world. These are revolutionary changes that we've not experienced before.

F&D: What does the prospect of people living longer mean for productivity?

OM: The world will benefit from the longevity dividend if longer lifetimes are accompanied by health improvements.

Illustration by Sonia Pulido

When people remain healthier for longer and continue to work in later life, this boosts productivity and economic growth and provides additional wealth in the form of millions more healthy productive person-years.

F&D: The way we work has also changed in recent years. How does that play into retirement?
OM: There have been a huge number of changes in the workplace, not just because of COVID and the advent of working from home. It used to be that the government took a much bigger role in the design of retirement systems. Employers would also be more involved when they offered defined-benefit plans. That has changed, not only in the US but around the world. As the workforce has changed, and people move between one employer and another, the idea of having to remain with one company for life just doesn't meet our needs anymore.

F&D: So people are more on their own when it comes to planning their retirement, and part of your research has been to look at how well people are doing in that respect. What have you found?
OM: I've been working with a group of researchers on a project known as the Health and Retirement Study, which was launched in 1992. We started surveying people aged 50 and over, and we follow them every two years until they pass away. With their permission, we've merged Social Security records, benefit records, and medical records into an incredibly rich database.

What we have learned from these surveys is that a goodly number of older individuals never planned for retirement, never saved for retirement, and were not well versed in how long they might live—not only their life expectancy, but the longevity risk they faced, meaning their chances of living to 80, 90, 100 (or even longer).

People who don't understand the tail risk of living for a very long time probably won't save enough and tend to retire too soon. One of the things I've been working on is trying to inform and educate people about that tail risk.

F&D: Should the government be trying to motivate people to save more?
OM: Many societies do that. In the US, we have so-called tax-qualified savings, where workers can put pretax money into their funded retirement accounts. Many other countries also have such plans. But there's always a tension, because people who can save for retirement are usually in the top half of the income distribution. People in the bottom half tend to have less money to save. In many cases, a nation's social security system will do a decent job replacing lower-paid workers' preretirement income, though private savings are often needed by the higher earners. Also, we need to understand that saving does take encouragement. Let's be honest, saving is not fun!

F&D: Spending is fun.
OM: Indeed, spending is far more rewarding. The British have discovered something that helps along those lines, called the lottery saving system, sponsored by the UK government. For every pound people deposit in their bank accounts, they earn a lottery ticket for a monthly draw. On average, people receive about the same as they would earn in interest in a regular savings account, but there are a few big prizes. And, of course, people love to win the lottery. So we need to think about new ways to make saving fun.

F&D: But does motivating people to save more for retirement come with some risk, given that spending is really what spurs growth?
OM: To the extent that people put their retirement savings into investments, this also helps grow the economy by making capital available to the tech start-ups and the other companies creating jobs. In my view, governments should also do more to push longevity awareness: if you don't understand how long you might live, then you will make financial mistakes along the way, as I said earlier. And ultimately, economists should talk to policymakers more. All too often researchers—in government, in multinational organizations, and in industry—tend to talk mainly to themselves. Yet policymakers need to know how academics can inform them. And conversely, policymakers have questions about things that academics might examine and evaluate.

F&D: Is financial literacy, or lack thereof, improving in our society?
OM: Financial literacy is absolutely essential in this complex financial world. In the US, 21 states now mandate financial literacy classes in high school. The young adults that grow up taking those classes are much better at planning, budgeting, saving for retirement, and so forth. Such knowledge can have a lifelong impact.

F&D: One can easily be drawn into taking on more credit now. Do you worry about the predatory nature of some of the investment options out there?
OM: I do worry about it, especially for a younger generation that is increasingly focused on apps on their phones. It's too easy for people to get involved in cryptocurrency and other complex financial products about which they are underinformed. As a result, they can end up losing a lot of money. In earlier times, your employer would help manage your retirement accounts, and your broker would help you invest in the stock market. But because people can now borrow and invest directly through apps, it's becoming much easier to be bamboozled and even defrauded. It's also a worry for the older population, where fraud is mounting too.

F&D: What steps should people take to stay anxiety-free and not run out of money in their retirement years?
OM: I like to quote Barbara Judge, a Penn alumna, who ran the British pension insurance system for some time. I've adopted her mantra, which was "Work longer, save more, and expect less." That's where we stand today. So if you are healthy enough to stay on the job, I'd say keep working as long as you can. F&D

This interview has been edited for length and clarity.

Book Reviews

Into the Maelstrom

Chris Wellisz

"Goodman's gift for storytelling and eye for vivid detail breathe life into an inherently arcane subject."

UNTIL ITS DRAMATIC COLLAPSE, most people barely knew that something called the global supply chain existed, much less understood how much their daily lives depended on it. Then, suddenly, toilet paper and frozen chicken disappeared from supermarket shelves, and COVID-19 patients were left dying in hospitals for lack of medical equipment. How could it have happened?

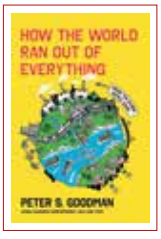
Enter Peter S. Goodman, veteran economics reporter for the *New York Times,* who chronicled the unfolding disaster at close quarters, from the factories of Shenzhen, China, to the ports of Los Angeles and Long Beach and the truck stops and rail yards of Middle America. His reporting forms the heart of this new book, *How the World Ran Out of Everything.*

Goodman's gift for storytelling and eye for vivid detail breathe life into an inherently arcane subject. His story follows the travails of one Hagan Walker, an entrepreneur who struggles to have an order of plastic toys shipped from a factory in China to customers in the United States in time for the holiday shopping season. (I won't reveal how the journey ended.)

Along the way, we meet a host of minor characters whose lives were upended by the pandemic and resulting economic fallout: sailors marooned aboard an idle container ship, a California farmer who cannot deliver his almonds to customers in the Middle East, and a railroad worker who is refused paid leave to care for a sick child.

Goodman widens his lens to deliver pithy accounts of the forces that propelled globalization. These include the economic reforms that unleashed China's export-led economic transformation; the invention of the shipping container, which dramatically reduced the time and expense of moving goods across oceans; and the concept of just-in-time manufacturing, which, taken to extremes, made the world more vulnerable to supply-chain disruptions, Goodman argues.

There are villains, too, including management consultants who counseled their corporate clients to slash inventories and payrolls in the name of lean manufacturing. The archvillain, however, is the "investor class," whose relentless pursuit of profit comes at the expense of consumers and workers.



HOW THE WORLD RAN OUT OF EVERYTHING

Peter S. Goodman

Mariner Books

New York and Boston, 2024, 406 pp., $37

Some of Goodman's reporting is truly moving, such as his description of the horrific conditions in meat-packing plants that were declared essential during the pandemic, leading to the needless deaths of many workers, including an immigrant from Myanmar who didn't live to see her grandchild born. Yet these stories are marred by somewhat tedious denunciations of "unregulated greed" and "cold-blooded exploitation."

The final chapters offer a quick survey of efforts at re-shoring and near-shoring. But the book ends on a pessimistic note, given that in Goodman's analysis, the root of the problem lies in the pursuit of profit. Goodman stops short of advocating the abolition of capitalism. Instead, his somewhat perfunctory conclusion calls for stricter antitrust enforcement and stronger labor unions. Nevertheless, his book offers a gripping and enlightening account of one of the most consequential economic events of modern times, told through the eyes of the people caught up in it. **F&D**

CHRIS WELLISZ *manages communications for the World Bank's trade team.*

Competing for the Future

"The authors argue that India should leverage technology to boost exports of services."

Krishna Srinivasan

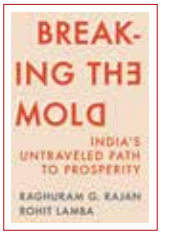
IN THEIR RECENT BOOK *Breaking the Mold: India's Untraveled Path to Prosperity*, Raghuram G. Rajan and Rohit Lamba argue that India's future economic well-being lies in a different development strategy than the one successfully followed by many other advanced and emerging market economies—such as Japan, Korea, Taiwan Province of China, and, most notably, China.

These countries pursued a strategy of export-led manufacturing that leveraged cheap labor and transitioned into more sophisticated manufacturing as they became more integrated into global supply chains. Drawing on their extensive experience in policymaking in India, Rajan and Lamba argue that India should break this mold by instead focusing on services, an approach that is more aligned with India's strengths and comparative advantage.

Why should India break the mold? The country has missed the bus, argue Rajan and Lamba, because the labor cost advantage no longer exists. And moving up the supply chain is not assured, as countries that moved early—not just China, but other emerging market economies, like Malaysia and Thailand—have developed their logistics so spectacularly that they can ship sophisticated manufacturing components easily and cheaply across the globe. Every segment of the manufacturing portion of global supply chains has become extremely competitive, so much so that even if India is successful in making its presence felt in low-skill assembly, it would not ensure profits or entry into other higher-skill manufacturing segments, they say.

Rajan and Lamba are persuasive in noting that it is in the early and late segments of a product's production in the global supply chain—involving R&D, design, branding, marketing, and such—that the most value is added, with the manufacturing middle segment adding only a modest amount. They are not suggesting that India should discriminate against manufacturing, but caution against throwing costly subsidies at manufacturers.

Rajan and Lamba argue that India should instead leverage technology to boost exports of services, such as chip design and financial modeling, and those that cater to a growing domestic market, such as education and health care. But the strategy would require greater reform of, and investment in, India's education system to generate a highly skilled, idea-generating, and entrepreneurial labor force. In their words, India must pivot from brawn to brain.



BREAKING THE MOLD
India's Untraveled Path to Prosperity

Raghuram G. Rajan and Rohit Lamba

Princeton University Press

Princeton, NJ, 2024, 336 pp., $35

There is a lot to like in Rajan and Lamba's book, including their call to revamp and revitalize India's education and health care systems; improve data, governance, and transparency; and decentralize power to bring it closer to the country's citizens. But their key recommendation leaves the reader wondering whether they are advocating a false binary choice between manufacturing and services. India does not have a sufficiently large skilled labor force to expand services as they advocate, and it will take a long time to get there.

It would also have been compelling if Rajan and Lamba had quantified the number of jobs that their proposed strategy would generate. With India projected to add 15 million people to the labor force every year, one could argue that it needs to create jobs across all possible activities and in every sector of the economy. To this end, wouldn't it be better for India to pursue a wide swath of reforms—including improving the business environment, scaling up investment in education and health care, bridging infrastructure gaps, trade liberalization, and labor and land reforms—and leave the decision on where to invest, and which activities to pursue, to India's entrepreneurial private sector?

Setting aside my disagreements, this book is a must-read for anyone who follows India. Rajan and Lamba should be applauded for lucidly articulating many innovative ideas that deserve serious attention and that should be actively debated. **F&D**

KRISHNA SRINIVASAN *is director of the IMF's Asia and Pacific Department.*

Currencies Considered

Tamim Bayoumi

"The early years of floating were beset by many financial and currency problems."

THIS SPLENDID CONFERENCE VOLUME comprises 28 succinct essays by top researchers and policymakers on the switch to floating exchange rates in 1973, plus an introduction by Maury Obstfeld and Doug Irwin, the editors. Its breadth, depth, and clarity attest to the quality of the editors and the extent of the network of the Peterson Institute for International Economics.

The diversity of topics, approaches, and conclusions makes reading the book feel a bit like looking through a kaleidoscope—fun and a bit disorienting in the best sense of that word. The initial section, "Historical Perspective on 1973 and its Legacy," illustrates the diversity of conclusions. While essays by Anne Krueger and Fred Bergsten are relatively positive, seeing floating as better than the alternatives, Robert Aliber views it as the cause of serial financial instability. The section also contains a fair bit of discussion of political economy constraints to improvements in the system, a theme that runs through the book.

The move to floating rates was a leap in the dark that turned out very differently from expectations. Exchange rates did not adjust smoothly but jumped around because financial transactions have always dominated those associated with trade, as noted by Hyun Song Shin. This financial dominance also explains why the demise of fixed dollar parities enhanced the role of the dollar, reflecting the unparalleled breadth and depth of US financial markets. In addition, the desire to stabilize exchange rates across European countries following the demise of dollar parities launched the monetary cooperation that culminated in the euro, as discussed by Philip Lane. Finally, most people expected the floating rate system to be a temporary stopgap, yet it remains, albeit with less-effusive accolades than might be expected on a golden anniversary.

Another theme running through the book is the evolution of the system. The early years of floating were beset by many financial and currency problems as countries sought to replace fixed parities with a different monetary anchor. Gradually, a new system emerged in advanced economies comprising inflation targeting, free-floating rates, and deep and highly integrated capital markets anchored on the dollar.

FLOATING EXCHANGE RATES AT FIFTY

Douglas A. Irwin and Maurice Obstfeld, eds.

PIIE Press

Washington, DC, 2024, 384 pp., $25

This integration and dependence on US markets caused major problems during the 2008 North Atlantic financial crisis, which led the Federal Reserve to arrange swap agreements with other major central banks and effectively made it the lender of last resort for the advanced world.

The book pays welcome attention to the experience of emerging markets, whose evolution has been slightly different and significantly rougher. While the more successful emerging markets have adopted inflation targeting and floating rates, their thinner domestic capital markets and lack of access to swap lines make them more vulnerable to financial shocks. This explains their continued use of intervention and capital controls. The last major regional bloc wedded to dollar pegs is Middle Eastern oil producers, reflecting their shallow capital markets and geopolitical considerations, as discussed by Adnan Mazarei.

The final section addresses the future of the dollar, the euro, and the renminbi. In contrast to the diversity of views elsewhere, there is relative unanimity that the dollar will remain the dominant currency for at least the next decade, since neither the euro area nor China offers the financial depth needed to replace it.

This book is a treasure trove of information and insight. I learned an awful lot from reading it and am sure you will too. **F&D**

TAMIM BAYOUMI *is a visiting professor at King's College London.*

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A Golden History

Analisa R. Bala

Kazakhstan's new banknote series tells the story of the little-known but extraordinary Saka

Kazakhstan's new 5,000 tenge banknote draws inspiration from the ancient Saka culture.

COURTESY OF NATIONAL BANK OF KAZAKHSTAN; RUELLERUELLE/ALAMY STOCK PHOTO

JUST 50 KM EAST OF ALMATY, Kazakhstan's largest city, lies a Saka burial mound dating back to the Iron Age. Unearthed in 1969, the site held the country's most significant archaeological find—the Golden Man. Clad in a suit of gold with a tall, pointed headdress resembling a crown, the ancient warrior was buried with over 4,000 gold artifacts, a short sword and dagger, and a silver bowl inscribed with the oldest known example of runic writing in Asia. The artistry and craftsmanship of the artifacts—mostly animal motifs—are highly sophisticated, shedding light on a little-known civilization light-years ahead of its time.

After Kazakhstan's independence, the Golden Man became a national icon. The warrior's armor takes pride of place in the national museum in Astana and tours the world, representing the country's rich cultural heritage and deep roots in central Asia, and is depicted on various state symbols and emblems. Elements of this ancient culture are also featured in the design of the country's new banknote series issued in December 2023, which is "dedicated to the Saka culture, emphasizing their connection with nature," according to the National Bank of Kazakhstan.

The Saka were an ancient tribe of nomadic warriors, later known as the Scythians. From about 900 to 200 BC they dominated the Eurasian steppe—a historically important travel and trade route that preceded the Silk Road. But they were largely unknown until the 18th century, when widespread looting of the burial mounds led to the discovery of hundreds of artifacts.

Dozens of archaeological sites have been uncovered since, but the Issyk kurgan, excavated in the 1960s, was the first of only two burial mounds found completely intact.

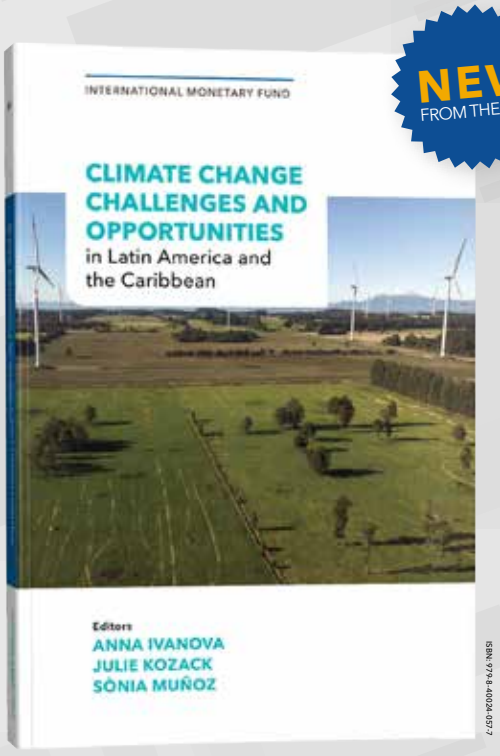
The front of the recently released 5,000 tenge banknote features a tree of life branch with a hovering bird from the Golden Man's headgear, symbolizing the connection to nature. A golden eagle–shaped artifact—recovered from the Taldy 2 burial ground in the Karaganda region—represents freedom and strength, according to the bank, and the country's strong ancestral ties to raptors, widely used for hunting.

On the back is a DNA spiral, which symbolizes the "infinite passage of time." As the late Shirin Akiner, a renowned scholar of Central Asian studies, noted in a documentary, there is still much to discover: "It does throw light on a period that really is dark—not because nothing is happening but because we simply don't know enough about it." F&D

ANALISA R. BALA *is a senior communications officer in the IMF's Communications Department.*

A display in the National Museum of Kazakhstan, Astana, showing a reproduction of clothing and equipment of the "Golden Man," an ancient Saka warrior.

FALL FEATURED TITLE



For policy makers tasked with reducing emissions, this book provides comprehensive taxonomy of mitigation tools and illustrates the impact of two specific policies: carbon pricing and fuel-subsidy reform.

The book provides a comprehensive approach to adaptation, based on building structural resilience and financial resilience which would yield significant long-run benefits for the most vulnerable countries in the region.

This volume illustrates the importance of enhanced economic flexibility through labor and capital reallocation, investment in skills and technology, improved governance and fiscal management.

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English: F&D, September 2024

MFIEA2024003