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A Quarterly Publication of the International Monetary Fund
March 2025 | Volume 62 | Number 1

The Economics of Talent

"Developing economies' empirical research holds critical insights."

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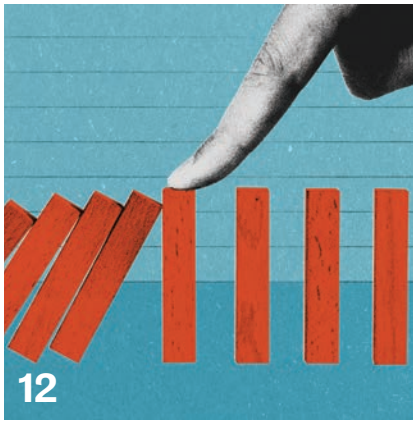

On the Cover
Paris-based cover artist Yasmine Gateau combines a child's silhouette and mathematical equations to show the benefits of finding the brightest young minds.

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A Quarterly Publication of the International Monetary Fund

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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, Japanese, Russian, and Spanish.
English edition ISSN 0145-1707

FSC FPO

Editor's Letter

How Talent Fuels Growth

EVERY GREAT LEAP in human progress—from the printing press to the steam engine to the semiconductor—has been driven by ideas. But ideas do not emerge in a vacuum; they come from people. And among them, it is often the most talented minds that push the boundaries of what is possible.

This makes talent one of the world's most valuable resources that can drive innovation and growth. Countries that develop the best minds gain a competitive edge. Those that fail to do so don't just slow their own progress—the world loses, too. Every untapped genius is a discovery that never happens, a technology that never emerges, a field that never takes off. The next transformative idea—a cure for a disease, a revolutionary technology—could come from anywhere. But only if the right minds are given an opportunity to reach their full potential.

Societies have a strong interest in expanding opportunities for people to become scientists, inventors, and entrepreneurs. Ruchir Agarwal and Patrick Gaule examine what they call *the missing equation*: how best to identify, nurture, and empower young geniuses, particularly in science, technology, engineering, and math. Overlooking even one talented individual can mean sacrificing insights that could transform entire fields. Too often, developing economies fail to spot their top talent early, allowing potential to go untapped.

Consider Tabata Amaral, a child prodigy from Brazil whose rise—from a modest background to become a leading voice in policy—was made possible by public school math Olympiads. "If I'm here," she says, "it's because of those competitions." Her case is all too rare. Across the world, latent talent often remains undiscovered—not for lack of ability but for lack of opportunity.

The data illustrate this reality. Research by Xavier Jaravel of the London School of Economics and his colleagues shows that access to education, family income, and social networks shape who becomes an inventor. Many children have the ability but lack the circumstances to realize their potential. The economic cost of this untapped talent is staggering. If gifted youth worldwide had equal access to the resources needed to develop their potential, global scientific output could rise dramatically, benefiting everyone.

"Every untapped genius is a discovery that never happens, a technology that never emerges, a field that never takes off."

Artificial intelligence adds a new dimension to this challenge. As IMF economist Marina Tavares notes, AI could either amplify human potential or shrink the space for innovation. If used wisely, it could empower talent at an unprecedented scale. If mismanaged, it could concentrate power in fewer hands and limit creative breakthroughs.

Meanwhile, Harvard University's William Kerr argues that countries adept at attracting and retaining top performers will be better positioned to counter demographic pressures such as aging populations and slowing productivity growth. The global race for talent is not just about finding the brightest minds—it is about securing the economic future.

Identifying standout individuals—especially in disadvantaged communities—is crucial. But so is expanding access to education. Strengthening secondary and postsecondary education, equipping youth with vocational skills, and fostering environments that nurture creativity and problem-solving can also help reduce inequality of opportunity.

The economics of talent is an emerging field, but one thing is clear: Smart policies that help people realize their potential can change the game for entire societies. We hope the articles in this issue will spark new thinking among policymakers and leaders. By shining a light on talent, we aim to inspire real progress where it matters most: expanding human ingenuity to solve the defining challenges of our time. F&D

Gita Bhatt, editor-in-chief

Kaleidoscope

A global view, in brief

THE BIG PICTURE: Barbados's economy grew at an annual pace of 3.9 percent in the first nine months of 2024 as tourists flocked to the Caribbean island's white-sand beaches. Labor market conditions improved, with unemployment falling to the lowest rate since 2008. *Above, a racehorse from the Garrison Savannah racetrack swims with its groom in the early morning at Pebbles Beach, outside Bridgetown. IMF Photo/Kim Haughton.*

Diverging Prospects

GLOBAL ECONOMIC GROWTH will remain steady at 3.3 percent this year and next, broadly aligned with potential growth that has weakened substantially since before the pandemic, according to the IMF's latest *World Economic Outlook Update*.

The report also projects that global inflation will decline, to 4.2 percent this year and 3.5 percent next year, in a return to central bank targets that will allow further normalization of monetary policy.

"This will help draw to a close the global disruptions of recent years, including the pandemic and Russia's invasion of Ukraine, which precipitated the largest inflation surge in four decades," Pierre-Olivier Gourinchas, the IMF's economic counsellor and director of research, wrote in a blog that accompanied the report's release in January.

But Gourinchas pointed to risks from the diverging prospects of some of the world's largest economies, notably between the fast-growing US economy on one hand and Europe and China on the other.

"In the near term, a constellation of risks could further exacerbate these divergences," he warned.

The main risk for the euro area is that monetary and fiscal policy will run out of room to support economic growth. China, meanwhile, could get stuck in a debt-deflation trap, with falling prices raising the real value of debt. And in the US, a combination of surging demand and shrinking supply risks reigniting inflationary pressures.

"Overall, these near-term risks could lead to further divergence across economies," Gourinchas said.

> "It is now urgent to restore fiscal sustainability before it is too late and to build sufficient buffers to address future shocks."
>
> —Pierre-Olivier Gourinchas, IMF economic counsellor

Overheard

"If there is one economic challenge that cuts across most of the globe, it is growth. Or rather the shortage of it...Better productivity growth will mean better prospects for people and ultimately a more stable, peaceful world."

—IMF Managing Director Kristalina Georgieva, writing in the *Washington Post*

"Maintaining international cooperation over the next two decades will be key to a successful Bretton Woods centenary—cooperation not only among the membership but with other global players, including private nonstate actors."

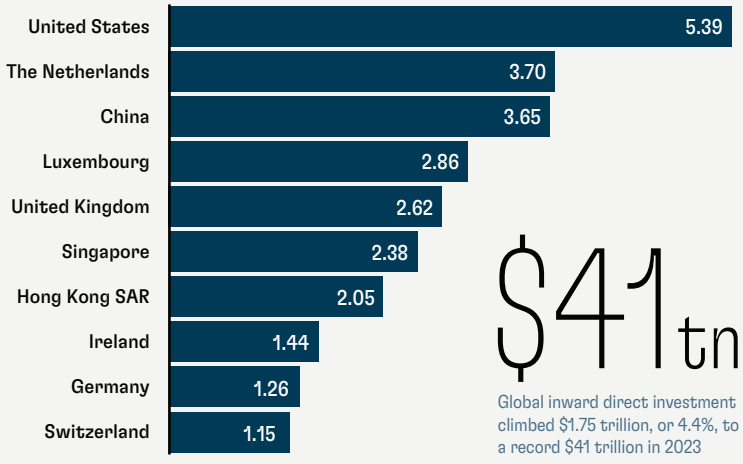
—Indonesian Finance Minister Sri Mulyani Indrawati, in an interview with *Finance & Development*

AROUND AND ABOUT: Nigel Clarke, one of four IMF deputy managing directors, met President William Ruto and representatives from civil society organizations on a visit to Kenya in December. "My visit was also a valuable opportunity to listen and learn from a cross section of Kenyan society," he said. *Above, dust hangs in the air as pedestrians and traffic flow in and out of downtown Nairobi. IMF Photo/Melissa Lyttle.*

By the numbers

Foreign direct investment rose to a record $41 trillion in 2023. The United States remained the top destination for inward investment, with China third.

TOP 10 FDI RECIPIENTS, TRILLIONS OF US DOLLARS, 2023



SOURCE: International Monetary Fund, Coordinated Direct Investment Survey.
NOTE: FDI = foreign direct investment; tn = trillion.

Back to Basics

Bonds and Yields

Yields on bonds of different maturities reveal much about an economy's prospects

S. Ali Abbas and Eriko Togo

FOR CENTURIES, governments have turned to investors to fund their activities. They mostly do this by issuing bonds. Today the global market in government sovereign debt is worth about $100 trillion—almost as large as the world economy itself. But what are government bonds? What determines how much investors will pay for them? And what can bond "yield curves" tell us about an economy?

Consider a government whose outlays exceed its revenues by $100. To finance the deficit, it can borrow from investors by issuing a bond. The bond is a promise by the government to pay back the $100 *principal* to investors at a future date, plus annual interest, called a *coupon* payment, to compensate investors for the *opportunity cost* of parking their funds in the bond rather than some other investment.

This opportunity cost has two components: an inflation component (to preserve the purchasing power of investors' money) and a real, inflation-adjusted, component (the additional return, on top of inflation, investors might forgo on alternative investments). The higher the expected rate of inflation and returns on alternative investments, the higher the return the government must generally offer investors.

Suppose the government issues a one-year $100 bond, or bill, with a coupon rate of 5 percent. This is a commitment to pay back investors $105 after one year: $100 in principal, $5 in interest. If the coupon rate equals the investors' opportunity cost, investors will be willing to buy the bond at its face value, or *at par* ($100, in this example).

But if investors' opportunity cost exceeds the 5 percent coupon, they will buy the bond only at a price *below par*. Say they are willing to pay only $98. This would provide a higher return on their investment, specifically 7.1 percent [(105÷98)-1]. This total return, which by definition equals investors' opportunity cost, represents the bond's *yield* (or yield to maturity).

Primary and secondary markets

A direct bond sale by the government to investors is a *primary market* transaction. But bonds can also change hands between investors in the *secondary market*. This is because bonds are tradable securities, like stocks. The key implication is that the *issuance yield* on a bond can differ from the prevailing *market yield*.

For instance, let's assume that a major commercial bank fails immediately after the government issues the $100 bond above. This fuels fears of a financial crisis and recession. As investors come to expect smaller returns and lower inflation because of the recession, the opportunity cost of funds falls sharply, from 7.1 percent to 3 percent. In this situation, the bond issued at $98 will now trade *above par* in the secondary market, at $101.95, to reflect the new market yield of 3 percent.

Governments can issue bonds of different maturities, typically ranging from 1 to 30 years. Each bond has its own coupon rate and associated yield to maturity. Longer-term bonds usually carry a higher yield. This is called *term premium*. It reflects the additional compensation investors demand for the uncertainty associated with future inflation and economic conditions, and for forgoing other investments for longer.

Chart 1 plots bonds' maturities on the horizontal axis and their corresponding market yields at a given time on the vertical axis. These *yield curves* tell us many things—the most important is whether markets expect the economy to strengthen or weaken.

Let's assume markets expect economic growth to accelerate. This means future inflation will likely be higher than present inflation: As the economy heats up, demand for goods and services will pick up and eventually feed into prices. The lure of alternative investments, such as commodities or property, will also rise as economic activity strengthens. Both these factors mean investors will demand a higher yield on a longer-term than on a shorter-term government bond. In other words, the yield curve will slope upward—as was the case for the US on

DALE CROSBY-CLOSE

December 16, 2024 (see red line).

Are yield curves always upward-sloping? No. When US inflation spiked following the COVID-19 pandemic, the Federal Reserve hiked interest rates. Because higher interest rates typically dampen household consumption and business investment, the hike fueled expectations of an economic slowdown, weaker inflation, and lower economic returns. Reflecting these market expectations, the government yield curve began to *invert*, or slope downward (see blue line). An inverted yield curve is often seen as a recession predictor, and, until recently, inversions preceded every US economic contraction for the past half century.

Country risk premium

Do yield curves of government bonds in emerging markets and low-income countries convey the same information as those of advanced economies? Yes, but with a greater focus on *country risk premium*. Major advanced economies are diversified, and their institutions are strong. Their sovereign bonds are generally considered safe because investors are almost certain the government will pay them back. The same cannot be said for all developing economies, which typically have weaker institutions and are more prone to shocks that can lead to large currency depreciations, rapid inflation, and loss of access to market funding.

Some developing economy governments—especially those with lots of foreign-currency debt—must sometimes restructure their debt (change their bonds' repayment profile, yield, or both). This *default risk*, or country risk premium, means their bond yields are generally higher than those for advanced economies across all maturities. This difference in bond yields, or *spread*, is an important indicator of sovereign credit risk (see dark gray line).

When country risk reaches a point where markets see debt restructuring as imminent, the yield on bonds with short residual maturities typically spikes, producing a sharply inverted yield curve. In early 2014, for instance, nobody knew that Ukraine would restructure its sovereign bonds within a year. But the March 2014 inverted yield curve showed that investors were already pricing in a debt event. Because such operations involve a bigger extension of the residual maturity of bonds falling due sooner (in 2015, say) than those due later (2018), investors demanded a higher yield on the former than the latter (see yellow line).

Developing bond markets

Many developing economies are working to develop the market for local-currency government bonds to reduce reliance on foreign-currency borrowing, which carries exchange rate risk. Putting in place the requirements for such a market—sound debt management, robust laws, regulations and market infrastructure, and a diversified domestic investor base—can take time, but the rewards are substantial.

The IMF, together with the World Bank, provides active guidance to governments in this area. It's encouraging that many developing economies, notably in Asia and Latin America, have made progress on this front in recent decades.

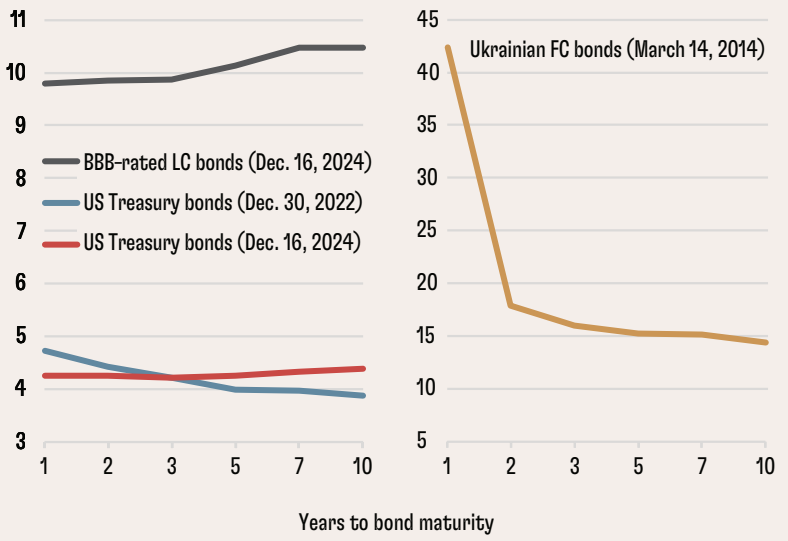
A yield curve in a well-functioning government bond market not only tells us something about the economy's outlook, but is also a benchmark for pricing other financial assets, such as long-term bank loans, corporate bonds, and mortgages. It facilitates more efficient allocation of resources and thus supports long-term economic growth. F&D

CHART 1

Yield curves

From booms to busts, the yield curve shows how markets expect economies to fare in the future.

(percent, per year)



SOURCES: Bloomberg Finance L.P.; and US Treasury. NOTE: LC and FC denote local and foreign currency, respectively. BBB- and lower-rated bonds are typically issued by emerging market economies.

S. ALI ABBAS *is a deputy director in the IMF's Fiscal Affairs Department.*
ERIKO TOGO *is a deputy division chief in the Monetary and Capital Markets Department.*

Point of View

In Search of the Invisible Hand

Oren Cass

Adam Smith's capitalism demands constraints on markets, not blind faith in them

The academic economist's dry prose usually benefits from an evocative metaphor. But we would all be better off if Adam Smith had skipped the bit about "the invisible hand." He meant little, if anything, by it—he used the term only once in the entire two volumes of *The Wealth of Nations*, as he had a single time, in an entirely different context, in *The Theory of Moral Sentiments*.

But in the second half of the 20th century, economists built an entire worldview around it, engendering the baseless assumption that, in the words of Pat Toomey, a former US senator, "capitalism is nothing more than economic freedom," that, left untended, it just works. Like the cartoon character Wile E. Coyote, they marched forward with plans lacking any means of support. Except it is not the economists who fell to the bottom of the ravine when their folly was discovered, it was the average citizen.

Understanding the term requires first visiting it in its natural habitat: "By preferring the support of domestic to that of foreign industry, he intends only his own security," Smith wrote, "and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention." The invisible hand did not refer to a magical force, but to the preference for domestic industry and the determination to direct industry toward produce of the greatest value.

And so, for most of its history, the invisible hand was given precisely the little attention it deserved. But drop "led by an invisible hand" into Google Ngram, plotting the frequency with which it appears across all English-language books since 1800, and just after World War II the phrase begins an inexorable march upward. Determined to defend democratic capitalism from enthusiasm for communism's central planning, economists like Paul Samuelson and Friedrich Hayek adopted Smith's metaphor and placed it at the center of their free market's logic.

Blind faith

Jonathan Schlefer, longtime editor of the Massachusetts Institute of Technology's *Technology Review*, has shown how Samuelson's *Economics*, first published in 1948 and the discipline's leading textbook for decades, contorted this modest insight into a declaration of blind faith and placed it at the center of the econo-

COURTESY OF AMERICAN COMPASS

Illustration by Chantal Jahchan

mist's worldview. Students learned that Smith had written, "He intends only his own security, only his own gain. And he is in this led by an invisible hand to promote an end which was no part of his intention." Not even an ellipse.

Hayek elevated the principle to a religion, professing "faith" in "spontaneous forces." He was proud to "assume that, especially in the economic field, the self-regulating forces of the market will somehow bring about the required adjustments to new conditions, although no one can foretell how." By the 1990s, economic historian Amity Shlaes could write in the *New York Times* that Adam Smith had created the "powerful image" of the "'invisible hand,' the hand of free commerce that brings magic order and harmony to our lives." What had been a description of the conditions under which markets *can* advance the common good became a claim that, regardless of conditions, they miraculously and automatically would.

Release Smith's conditions, though, and the logic immediately falls apart in theory, and has indeed collapsed in practice. If the hard, capital- and labor-intensive work of extracting natural resources, practicing agriculture, building infrastructure, and manufacturing products offers the best return on capital, businessmen pursuing their private interest will indeed advance the common good. If those activities consistently offer a less attractive investment profile than trying to build a unicorn cloud-based application that might scale to millions of users in a year or two with just a few employees, capitalism may generate a facsimile of GDP growth, but it will not work in the sense Smith described and that a nation requires.

National decay

If growth and margin expansion depend on investing in higher worker productivity, innovation will occur, wages will rise, and prosperity will spread. But if firms can most easily grow sales while reducing costs by offshoring production to foreign labor or bringing that labor into the United States for "jobs Americans won't do," capitalism will not work. If top business talent find they can earn more money trading piles of assets in circles than making productive investments in the real economy, capitalism will not work. The market will deliver the profits, as the US has learned, but also national decay.

> "Capitalism can work, but only with constraints that ensure the ensuing pattern of trade is indeed mutually beneficial."

Press economists on how they can be confident that capitalism will deliver prosperity under globalization, and the account drifts gently off into the void. To be sure, capitalism *can* work, but only with constraints that ensure the ensuing pattern of trade is indeed mutually beneficial. How does the Ohio worker benefit when a local investor moves capital to Shenzhen in search of a higher return? Hayek promised that "some necessary balance, between demand and supply, between exports and imports, or the like, will be brought about without deliberate control." The US trillion-dollar trade deficit begs to differ.

The reductio ad absurdum of the imaginary invisible hand is the confidence projected from Wall Street that the metastasizing financialization of the economy must be good for the nation because this is how people are choosing to pursue profit. For instance, University of Chicago professors Todd Henderson and Steven Kaplan have argued in the *Wall Street Journal* that private equity investments generate "enormous social value" based solely on the fact that they achieve gross returns in excess of market averages. But no actual theory or evidence in economics supports the idea that the strategies delivering the highest returns to leveraged buyout funds bear any correlation to the forms of investment that best, in Smith's words, "promote the public interest."

Market fundamentalism

Unlike the market fundamentalism fostered by a misunderstanding of the invisible hand, Smith's actual thought provides quite useful guidance to contemporary policymakers. How can we create a preference for "the support of domestic to that of foreign industry" and ensure that "directing... industry in such a manner as its produce may be of the greatest value" is the path to greatest profit? Those conditions, alongside "freedom," are the prerequisites to a well-functioning capitalist system.

Encouragingly, the surging popularity of the invisible hand in Google Ngram reaches an abrupt halt in 2014–15 and then begins a plunge equally steep. Those years happen to be the ones when David Autor and colleagues published their "China Shock" research and Anne Case and Angus Deaton called attention to the calamitous rise in "deaths of despair." The following year, the United Kingdom voted to leave the European Union and the United States elected Donald Trump president. As if by an invisible hand, our political systems do respond to failure and create the opportunity to make amends. F&D

OREN CASS *is founder and chief economist of American Compass, a think tank.*

How to Deal with Debt's Downside

Anne O. Krueger

International arrangements for rescuing countries from debt distress must be improved

Mounting debt in developing economies is a growing concern. Some countries, including Sri Lanka and Zambia, have already declared that they cannot service their debts and have sought international assistance. Many others face onerous debt service obligations amounting to several percentage points of GDP.

Debt is a blessing and a curse. It enables developing economies with promising prospects to finance the investment in roads, schools, hospitals, and other areas they need to turn those prospects into realities. If investment produces the expected high rate of return, countries can service their debts. That was the case in Korea in the 1960s.

Back then, Korea was a poor country with a low saving rate of less than 10 percent. It borrowed about 10 percent of GDP a year, but its fast-growing economy generated such high investment returns that its debt servicing ratio actually fell. Over time, its domestic saving rate rose so that it could sustain strong investment-led growth without recourse to foreign debt. Today Korea is among the world's richest nations.

Debt, however, can become a problem when it's used to finance current consumption or poorly conceived investment. When investment doesn't pay off, the borrowing country is made poorer because it must still service the loans it took out to finance it. The likelihood that further borrowing will produce higher returns usually falls because mounting concerns about creditworthiness push up interest rates. If the borrower's economic prospects worsen, creditors can and do refuse to roll over debt.

Range of risks

When deciding whether to extend additional credit to a developing economy, lenders must weigh up a range of risks, from the country's macroeconomic policies and prospects to possible swings in the prices of its principal commodity exports. Sometimes promises of policy reform by an incumbent or incoming government—perhaps in conjunction with an IMF program—can convince lenders that the country will restore its creditworthiness. In these cases, lenders usually agree to roll over maturing debt.

But when government policy produces poor results and politicians refuse to change course, lenders will likely insist on repayment when debt falls due. The result is a debt crisis. Balance of payments pressures can become so acute that the borrower cannot even pay for imports of essential goods and services.

That was the case in Sri Lanka in 2021. When the crisis hit, the country could afford imports only of essentials, such as food and fuel. Buses did not run, so people couldn't go to work. Many factories could not obtain raw materials, intermediate goods, or spare parts. Lengthy power outages were common. Economic activity fell sharply, by 7.8 percent in 2022 and a further 3.8 percent in 2023. Grocery stores emptied of essential goods. Inflation spiked.

Three things had to happen for Sri Lanka to rebuild its credibility and set the stage for recovery and sustainable growth. First, the country needed a source of foreign exchange to buy essential imports to restart power plants, fac-

JOSHUA ROBERTS

Illustration by Chantal Jahchan

tories, transport, and other essential services. Second, it needed debt restructuring so that lenders could be confident that debt would be serviced. And third, it needed domestic policy reform.

Political resistance

Without policy reform, foreign exchange might have provided some short-term relief. But Sri Lanka would not have received private financing for imports until it resolved the problem of unsustainable indebtedness. The situation became so dire that protestors overthrew the government. Policy reform became possible only when a new president took office in 2024.

Politicians are almost always cautious about reform that is likely to encounter stiff political resistance. The choice, however, is between short-term pain or letting the situation get worse and causing even more pain in the long run. The big risk is that reforms do not go far enough and fail. The reformers themselves are then unfairly blamed.

The IMF plays a supporting role in resolving challenges like Sri Lanka's. It is the institution responsible for safeguarding the international monetary system. Its core strength is its ability to assess a country's macroeconomic situation. The Fund has financial resources that can be lent (usually for not longer than three to five years) to support countries in difficulty. But the IMF charter states that it can do so only when there are reasonable assurances that the borrower will be able to service the loan. Sri Lanka's authorities and the IMF agreed to a reform program. However, Sri Lanka also needed to restructure its debt to deal with its arrears and regain access to international credit markets.

Holdout creditors

When a country was in serious difficulty in years past, sovereign lenders met through the Paris Club. They would discuss a program to restore growth and creditworthiness on which the country's authorities and the IMF had already reached an understanding. Private creditors also met. The IMF was consulted as the country and its creditors negotiated debt service adjustments—often a "haircut" (a reduction in the face value of outstanding debt) and perhaps a pause in payments. When all parties agreed to the restructuring plan, the IMF would then lend (often in conjunction with new loans from bilateral sovereign creditors).

In the past decade, however, China has become a large sovereign creditor but has chosen to remain outside the Paris Club. While it has granted debt relief in many cases, it does not have fully developed internal processes for considering haircuts and has given its lenders only limited discretion to reschedule debt service payments.

"There must be a stronger arrangement under which a holdout sovereign creditor will not receive debt service payments until it accepts the same terms as other creditors."

Sri Lanka was one of the first countries with China as a large creditor to reach a point where its debts proved unsustainable. It took almost two years for the rest of the international community to work out an agreement that satisfied the Chinese, and the IMF program was delayed by nearly a year as a result. This prolonged the pain for Sri Lankans.

Clearly, the IMF cannot be expected to lend if creditors and private lenders suspect their loans will be used to finance debt service to a holdout country. In Sri Lanka's case, no creditor would restructure, and so the IMF could not resolve the country's problems. At the same time, delays restructuring debt while awaiting the holdout creditor's decision piled pressure on the crisis-stricken country and pushed back economic recovery.

A better way

We must find a better way to address the problem of developing economy indebtedness. At a minimum, countries in crisis must be able to develop a restructuring plan with the IMF, the Paris Club, and other creditors. There must be a stronger arrangement (beyond the incentives of the IMF's lending into arrears policies) under which a holdout sovereign creditor will not receive debt service payments until it accepts the same terms as other creditors. It would be even better for China to join the Paris Club.

An internationally agreed procedure and tribunal where creditors and debtors alike could present their claims would be better still. The tribunal could determine a settlement that enables normal economic activity and sustainable growth to resume while also giving creditors as fair a settlement as possible under the circumstances. With debt problems mounting, it's time to reform existing arrangements. F&D

ANNE O. KRUEGER *is a senior fellow at Johns Hopkins University's School of Advanced International Studies and the Caroline Ritch Emeritus Professor of Sciences and Humanities in Stanford University's economics department. She is a former World Bank chief economist and IMF first deputy managing director.*

GENERATIONAL CONCERNS

People in many countries are losing hope that children will be better off

PEOPLE ARE PESSIMISTIC about the financial future of the next generation, according to a recent survey by the Pew Research Center in Washington, DC. And that pessimism clearly reflects perceptions of economic inequality, the survey of 36 countries shows.

Most say children will be worse off than their parents. A median of 57 percent of respondents share this view. Concern is especially high in advanced economies, including Canada and the United States and many European nations (see chart on right page). "This pessimistic view about the economic future is shared by younger and older adults alike, as well as by people with higher and lower incomes," Pew says. But some of Asia's fast-growing developing economies—including India, Bangladesh, Indonesia, and the Philippines—are more optimistic. At least 70 percent of respondents there say children will be better off.

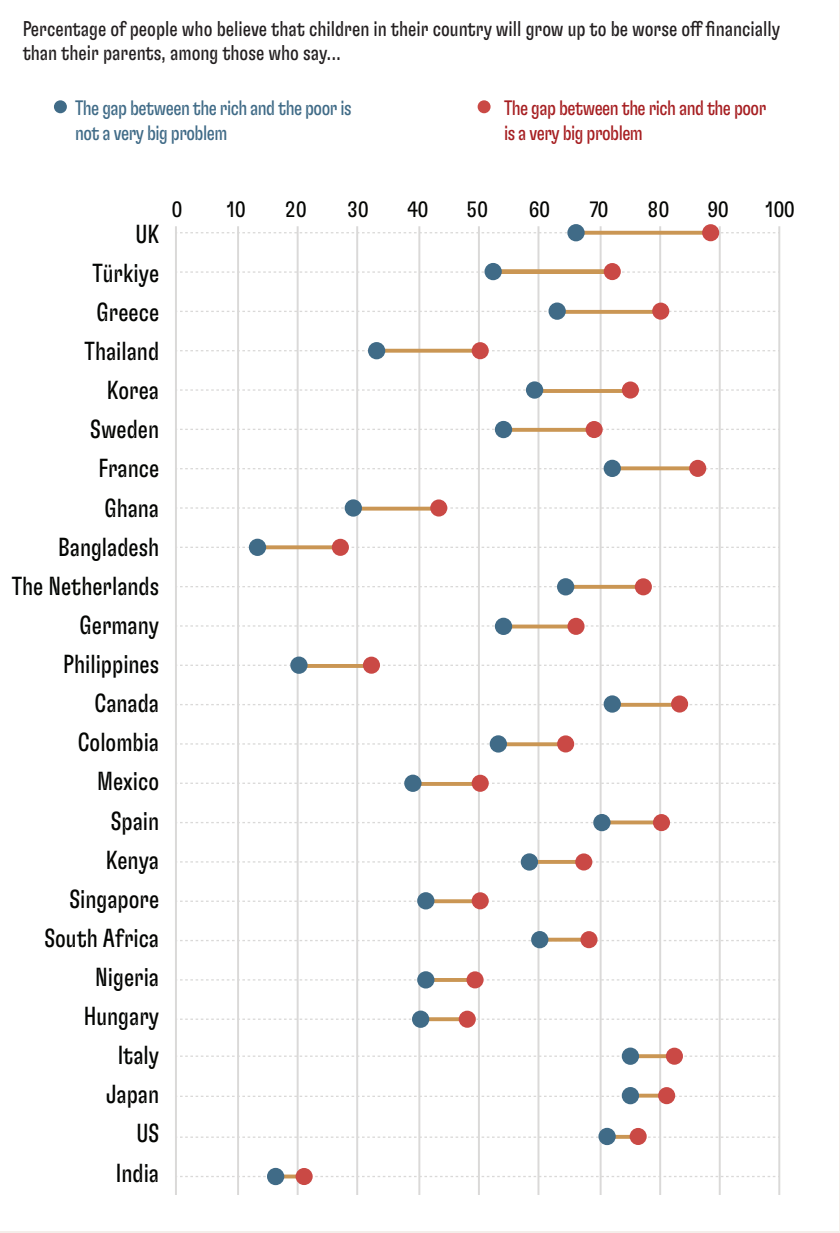
Pew links pessimism to perceptions of economic inequality (chart on this page). "In most countries, people who consider the gap between the rich and the poor to be a very big problem are especially pessimistic about how children will fare financially when they grow up," researchers said. In the UK, for instance, 88 percent of respondents who say the gap between rich and poor is a very big problem also think children will be worse off. Only 66 percent say children will be worse off among those who believe the wealth gap is not a very big problem.

Pessimism has grown since the pandemic. In 15 out of 31 countries, more people say children will be worse off, compared with surveys before COVID-19. For example, the share of Germans who think children will be poorer than their parents has increased since 2019—from 42 percent then to 61 percent today. F&D

MARTA DOROSZCZYK *is on the staff of* Finance & Development.

Wealth gap

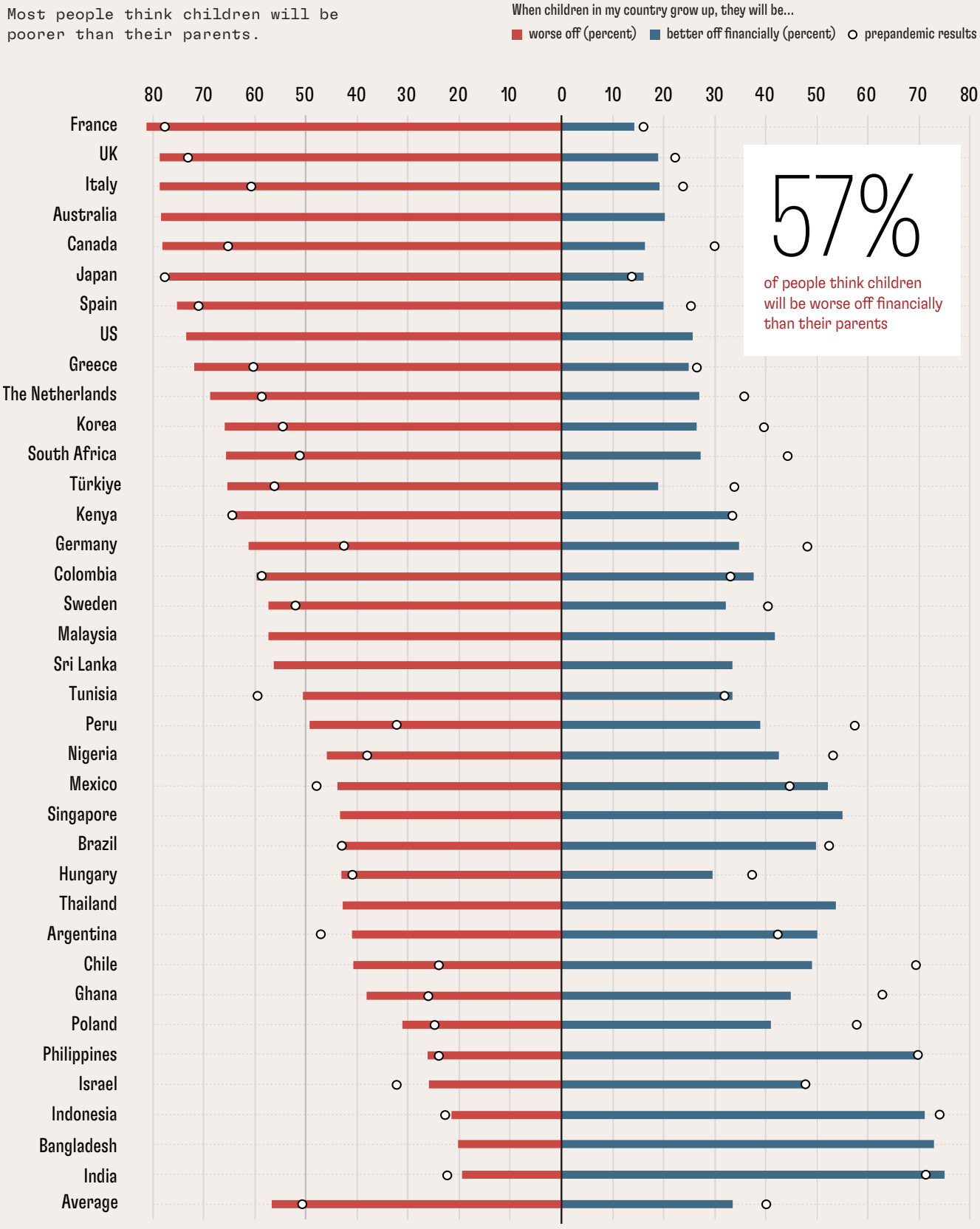
People who see economic inequality as a very big problem are more likely to believe that future generations will be worse off than their parents.



SOURCE: Pew Research Center, "Economic Inequality Seen as Major Challenge around the World." Spring 2024 Global Attitudes Survey, Washington, DC.

Worse off

Most people think children will be poorer than their parents.



SOURCE: Pew Research Center, "Economic Inequality Seen as Major Challenge around the World." Spring 2024 Global Attitudes Survey, Washington, DC.

THE TALENT EQUATION

The new "economics of talent" field aims to identify and nurture exceptional problem-solvers at an early stage

Ruchir Agarwal and Patrick Gaule

Illustration by Yasmine Gateau

Before he became one of the greatest mathematicians in history, Srinivasa Ramanujan was a young clerk in India's southern port city of Madras. With no formal college education, he spent his free time scribbling strange but beautiful math formulas in notebooks. In 1913, hoping someone would take him seriously, he wrote a letter to G. H. Hardy, a top mathematician at Cambridge University.

"Local mathematicians are not able to understand me," Ramanujan wrote, sharing pages filled with his ideas on number theory and infinite series. At first, Hardy was unsure of what to make of it. But soon he realized he was looking at genius. Hardy brought Ramanujan to Cambridge, where his ideas took flight. Their partnership transformed mathematics and laid the foundation for breakthroughs in fields like cryptography and computer science, and even in the understanding of black holes.

Ramanujan's story raises three key questions. How can we identify talent? What support do brilliant minds need to thrive? And what is the cost to society when talent is wasted?

An emerging field, the economics of talent, seeks answers to these questions. The goal is to provide a road map for spurring innovation and unlocking progress on the world's toughest challenges, from climate change to public health.

We define talent as the capacity to solve novel problems efficiently in a person's late teenage years. Talent is shaped by both innate abilities and accumulated learning. It shows up in how quickly people grasp math or science, how naturally they engage with challenges, how creatively they apply knowledge to unfamiliar situations, and how they persevere until they reach solutions.

Seeking talent

History shows how an extraordinary individual can transform an entire field, from Albert Einstein's physics advances paving the way for nuclear energy to Jonas Salk's creation of the polio vaccine. More broadly, the allocation of talent can aid economic growth, as economist William Baumol argued in his work on productive and unproductive entrepreneurship. Kevin Murphy, Andrei Shleifer, and Robert Vishny showed that growth depends on talent allocation. Nations thrive when their brightest minds become researchers, engineers, or entrepreneurs—not when they spend their talent finding ways to manipulate financial and legal systems.

But first, their talent needs to be discovered and developed, an area economists have traditionally paid less attention to. Our blind spot means we don't know what policies can help promising people realize their potential. Even in higher-income countries, standardized tests and rigid curricula can overlook unconventional thinkers.

It is all too common for a precocious child to be dismissed as disruptive, or for a family in a remote region to have no idea that advanced training resources even exist. Studies in psychology also reveal that some children show "precocious talent" early on, but their spark can fizzle without specialized mentorship, intellectual stimulation, and supportive peer groups.

There's also understandable concern that focusing on a small group is elitist. But broad policies aren't necessarily at odds with targeted programs. Just as building soccer fields in every neighborhood makes it easier to find the next Pelé, investments in public goods like universal education and health care lift economic prospects for everyone.

Targeted support for young geniuses can complement those efforts and unlock tremendous progress at a relatively low cost, by ensuring that minds with extraordinary potential do not remain undiscovered or underutilized. As Ramanujan's case reminds us, overlooking even one such individual can mean sacrificing insights that transform entire fields.

What we know

It's well established that talent tends to manifest in the teenage years or sooner, something we can see in the winners of one of the top awards for mathematics. Half of the winners of the Fields Medal had previously competed in the International Mathematical Olympiad (IMO), a competition for high school students with only a few hundred participants per year.

The importance of supportive environments is also clear. Mentorship, financial support, and

engaging with peers can turn an isolated prodigy into a powerhouse of innovation. Economists such as Alex Bell and colleagues have shown that children of patent holders tend to become inventors themselves.

Our own research shows that IMO medalists from low-income countries are less likely to produce influential research, perhaps because they lack access to top universities, or more generally to institutional support and global networks. These findings suggest that even strong natural ability isn't enough if a young person faces financial and geographic barriers.

And it's clear that major gaps persist in discovering potential talent worldwide. About 90 percent of young people live in developing economies, yet people born in the United States, Europe, and Japan win the overwhelming majority of Nobel Prizes in chemistry, physics, and biology (see Chart 1).

While multiple factors could contribute to this disparity, developing economies often fail to identify top talent at an early stage. For instance, Africa has produced only three IMO gold medalists, compared with 86 for Romania. But there are encouraging signs. By enhancing its talent discovery and training programs, India finished fourth among more than 100 countries at last year's IMO, a remarkable leap from 52nd in 2017. The country engineered a similar transformation in chess as well.

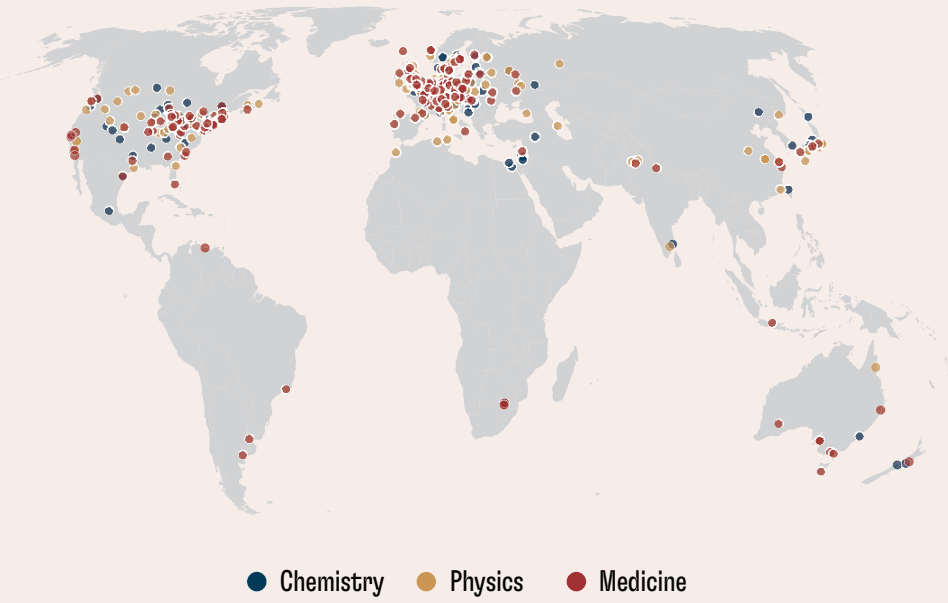
Finally, migration policies that promote brain circulation can help both sending and receiving countries. Bright students who move abroad often

CHART 1

Invisible geniuses

About 90 percent of young people live in developing economies, yet people born in the United States, Europe, and Japan win the majority of Nobel science prizes.

Birthplace of Nobel laureates, 1901–2024



SOURCE: Ruchir Agarwal.

reach greater heights, but home countries worry about losing their best minds. In rich countries, concerns about immigration can make it harder for foreign talent to secure visas.

However, people who study and train abroad and later return to their region of origin—or stay connected through global networks—are essential to spreading ideas and technology across borders. They start businesses that draw in foreign investment, create jobs, and provide essential services at home. Activating that two-way flow requires flexible policies and institutions that encourage the movement of knowledge and allow people to travel freely back and forth.

What we don't know

Despite these insights, further research is needed on identifying, nurturing, and understanding the impact of talent on innovation and economic growth.

Even in developed economies, it's hard to detect extraordinary ability that does not align with conventional measures. Standardized tests can miss creative reasoning, and students from remote or underprivileged regions may not take them at all.

Some education experts wonder if emerging technologies—such as artificial intelligence tools that analyze a student's work—could better identify hidden potential. Yet we still lack robust evidence on how to scale such methods or avoid biases that favor well-connected or wealthy applicants.

Spotting gifted students is one step. Ensuring their growth is another. While there's abundant research on educational strategies, much less is known about their use with high-ability students, who may learn differently.

Are specialized high schools with advanced curricula, highly qualified teachers, and advanced peers the best way to help promising students excel? Or could distance learning work for promising students with no access to highly qualified teachers locally? How helpful are quick boosts—like six-week intensive programs—in promoting learning and shaping career aspirations for such students? What are the returns on these interventions in terms of career outcomes and contributions to society?

While anecdotal accounts suggest that a handful of talented individuals can spur enormous progress, precisely how this unfolds remains underexplored. Which fields, beyond the usual suspects of technology, science, and art, benefit most from finding and developing exceptional ability? Should governments incentivize top minds to tackle social challenges like public health? Scholars of innovation often struggle to measure the long-term effects of a single breakthrough, or multiple breakthroughs from one lab.

The emerging field

Although the field is still forming, a new wave of economists is addressing these questions. We explored them at a National Bureau of Economic Research conference in November 2024. Discussions in Cambridge, Massachusetts, touched on research on the role of mentors in identifying exceptional talent; the effectiveness of summer programs in science, technology, engineering, and math for underrepresented youth; and the effects of targeted acceleration in middle school math.

One takeaway was the need for more systematic tracking. When we follow, say, 13-year-olds who show math flair at Olympiad camps, we can see whether scholarships and advanced mentorship change their lives.

Without solid data, policymakers and funders risk pouring resources into programs that might look good on paper but have limited real-world effects. Context is also essential: Approaches that succeed in a tech-savvy city may not work in a community with few teachers and sporadic electricity.

Developing clean energy, improving global health, and ensuring humanity benefits from advances in artificial intelligence demand fresh thinking. If a young person with the potential to advance nuclear fusion or design next-generation cures never finds the right mentors, the entire world loses.

Next steps

Our interest in the economics of talent is also about putting research into action. Motivated by our findings, we created the Global Talent Fund to drive initiatives like the Backing Invisible Geniuses (BIG) program, which provides scholarships, mentorship, and research opportunities to Olympiad medalists worldwide. Many of these scholars come from emerging market and developing economies, gaining access to opportunities they might not otherwise have.

The Global Talent Fund further supports organizations across more than 30 countries, helping nations like Pakistan achieve their best-ever results at the Math Olympiad. By investing in regional olympiads and local training partnerships, the fund empowers talented youth to reach new heights and realize their full potential.

The role of governments is also important. They can identify and nurture talent by funding specialized secondary school programs, engaging in outreach to marginalized areas, and adjusting admissions processes to spot unconventional brilliance.

Universities and research institutes can form partnerships with local schools, offer remote mentoring, and refine scholarships so that they target high-ability students with limited means. Businesses, which also gain by strengthening this pipeline, can set up labs in emerging regions, sponsor advanced camps or competitions, or fund online platforms that let young innovators connect with experts.

Nurturing top minds is not a rejection of broad policies that benefit all students. It is a complementary approach that can unlock game-changing discoveries. Failing to do so deepens global inequality of opportunity. Yet when even a single high-ability youth from a marginalized setting scales new heights, it gives kids the most powerful thought: So can I.

Far from elitism, this is a practical strategy to harness what social scientists and psychologists have long documented: Some individuals, by their late teens, already show extraordinary ability to tackle new problems. But before this precious resource can be allocated, it must be discovered and fostered. This is a missing piece of the talent equation that we must urgently address.

Human brilliance emerges in every part of the globe. By learning how to identify, nurture, and empower this gift, we can transform individual lives and inject new energy into innovation at large. Whether the next leap comes in renewable energy, biomedical technology, or an unforeseen domain, it could originate from someone we don't yet know.

As Hardy said of Ramanujan, "I owe more to him than to anyone else"—a timeless reminder of the transformative power of realized talent. The economics of talent is dedicated to finding ways to make sure such individuals get the chance to solve problems in ways that benefit us all. **F&D**

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"Without solid data, policymakers and funders risk pouring resources into programs that might look good on paper but have limited real-world effects."

INNOVATION'S UNSEEN FRONTIER

Xavier Jaravel

Democratizing innovation can harness untapped talent and spur economic growth

Notwithstanding Plato's 2,400-year-old proverb, necessity alone is not the mother of invention. It also requires opportunity. An individual's likelihood of becoming an innovator reflects parental background in terms of income and sociological factors, recent research shows. Highly talented children from disadvantaged backgrounds tend to innovate far below their potential, while children from wealthier or more educated families are much more likely to pursue innovation.

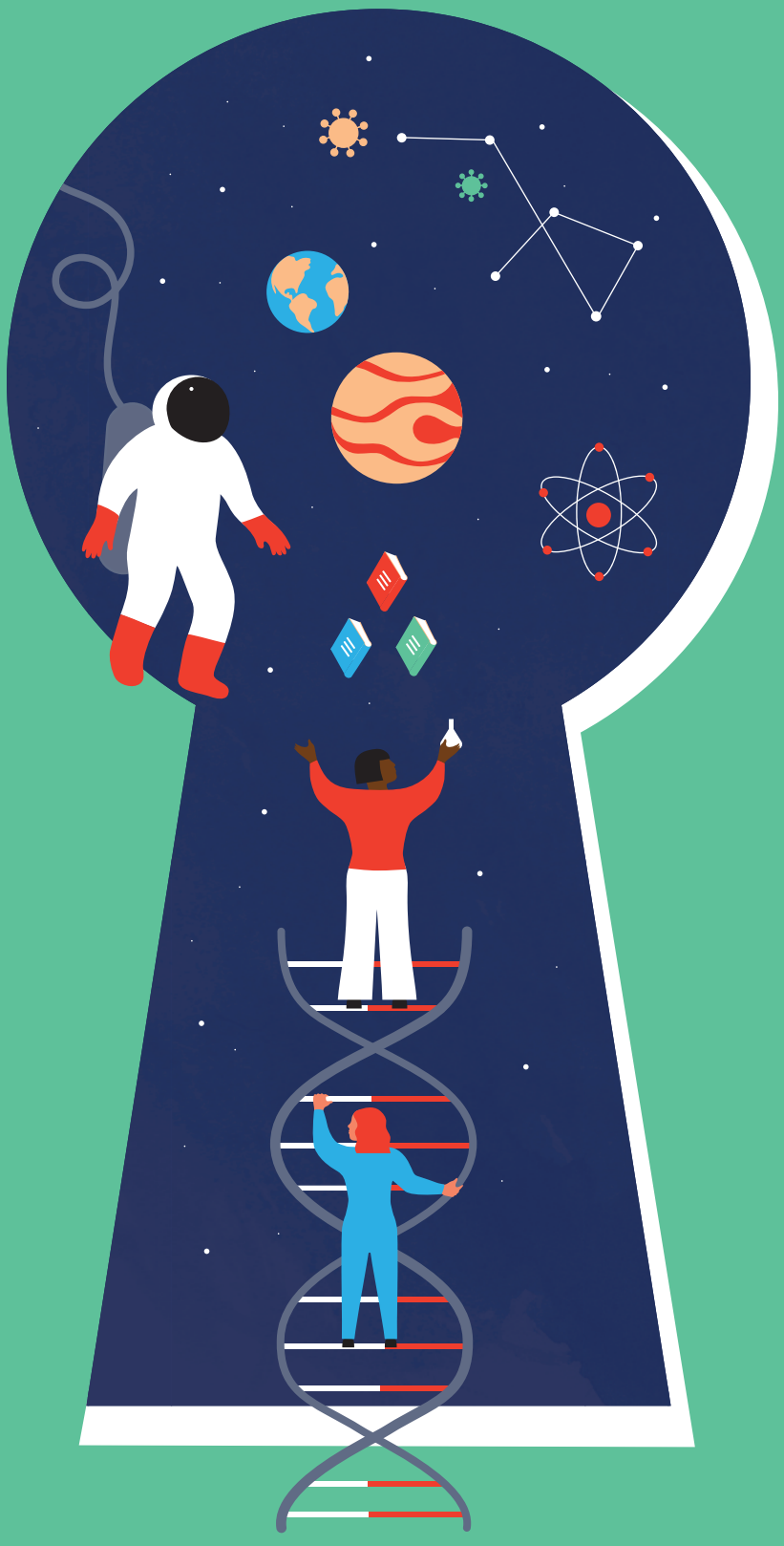
This creates the phenomena of "Lost Einsteins" and "Lost Marie Curies," phrases I coined with researchers Alex Bell, Raj Chetty, Neviana Petkova, and John Van Reenen (2019). Women, in particular, are dramatically underrepresented among innovators everywhere. This is no small matter. The scientific output of future generations worldwide could increase by as much as 42 percent if talented youth everywhere had equal opportunities to develop their potential, according to Ruchir Agarwal, Ina Ganguli, Patrick Gaule, and Geoff Smith (2023).

Thus, democratizing access worldwide to careers in innovation is a key to expanding long-term growth and narrowing inequalities. By mobilizing a vast pool of untapped talent, we can achieve the higher growth rates necessary for addressing critical challenges like the green transition, public debt sustainability and poverty reduction, and narrowing of gender and intergenerational inequalities. Simple, targeted policies can democratize innovation. The macroeconomic implications are enormous.

Parental backgrounds

My research colleagues and I published a study six years ago on who becomes an inventor in the US. Using 1996–2012 data from the US Patent and Trademark Office, we showed a correlation between

Illustration by Simona Bortis-Schultz



parental income and the likelihood of obtaining a patent (see Chart 1). Among those whose parents' earnings fell below the 80th percentile, there were fewer than four inventors for each thousand people. For individuals whose parents were in the top 20 percent of earners, there were as many as eight patent holders among each thousand people.

We refined the analysis to compare access to careers in innovation for people who had similar math test scores in the third grade. The data showed that children who had lower test scores at that age generally had a smaller likelihood of eventually becoming an inventor, regardless of parental earnings. But among kids who scored at the 90th percentile or higher, those whose parents were in the top 20 percent of earners grew up to include more than twice as many patent holders as those from families with lower incomes.

Parental contributions extend beyond financial support for their children's education and careers in innovation. They also include the transmission of knowledge and aspirations. In Finland, education is entirely free and universally accessible, from kindergarten through doctoral studies. And yet researchers led by the London School of Economics' Philippe Aghion in 2017 found significant disparities in access to careers in innovation that were comparable in magnitude to the disparities found in the United States. This suggests that sociological factors rather than financial constraints play a critical role in shaping these disparities. Role models in childhood create aspirations that influence career choices.

Macroeconomic implications

The macroeconomic costs of untapped talent are staggering. A new model that I developed with Elias Einio and Josh Feng (2023) demonstrates that gender parity in access to careers in innovation could boost productivity growth by 70 percent. For high-income countries such as the United States, this would translate into an annual increase in productivity growth of 2.0 to 3.4 percent (Chart 2). Such a substantial gain would have profound implications for both societal welfare and tax revenue. The researchers' model also shows that bringing the highest-ability children into innovation careers would account for most of the economic gains.

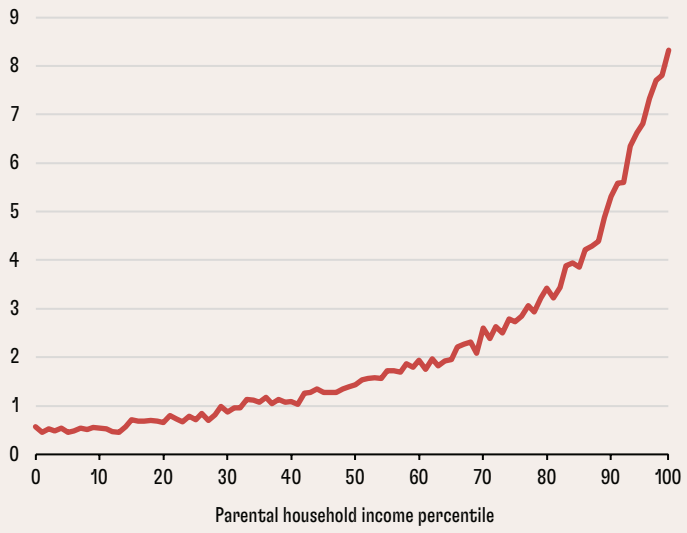
Family background is just as significant as gender in shaping access to careers in innovation. Providing equal opportunities for all individuals in the top 1 percent of the skill distribution, regardless of family background, could increase GDP growth rates by 55 percent. Recognizing the macroeconomic importance of policies aimed at closing these gaps—whether by gender or socioeconomic background—is therefore crucial.

CHART 1

Wasted talent

Children from poorer households are far less likely to become inventors.

(US patent inventors per thousand children)



SOURCE: Bell and others 2019. **NOTE:** 1980–84 birth cohorts.

CHART 2

Gender gains

Gender parity in access to careers in innovation could raise advanced economies' productivity growth rates to 3.4 percent.

(advanced economy labor productivity, annual growth, percent)

SOURCE: Einio, Feng, and Jaravel 2023. **NOTE:** Baseline represents 12 percent female inventors.

Direction of innovation

Diversifying the pool of inventors offers another significant advantage. Beyond accelerating the pace of innovation, this could influence its direction. Historical examples suggest that innovators' personal experiences often shape their entrepreneurial vision, which in turn affects the sociodemographic groups that benefit from these innovations. In essence, innovators frequently focus on solving problems they have faced themselves.

For instance, in the late 19th century, the wealthy US socialite Josephine Cochrane invented the "dish washing machine" to protect her fine china, which her household help often damaged during handwashing. More recently, Christopher Gray drew on his own experience as the son of a struggling single mother to develop the scholarship app Scholly. Gray created the app to help students search for private scholarship opportunities based on criteria such as their major or state of residence. Meanwhile, female entrepreneurs addressing underserved needs are driving a boom in "femtech," or new health technologies benefiting women.

Research findings show that innovators often create products tailored for people like themselves, from medical innovation to mobile apps and consumer packaged goods. For example, innovators from high-income families are more likely to develop products aimed at high-income consumers. They tend to avoid industries that cater to basic needs, such as food, and are more likely to engage in sectors that target luxury markets, like finance. Similar patterns apply to gender and age. These tendencies contribute to purchasing power disparities across different consumer groups.

Policy prescriptions

Growing evidence suggests that promoting innovation requires not only general human capital policies but also targeted initiatives to provide specific exposure to careers in innovation. Bell and others (2019) demonstrate that childhood proximity to inventors increases a person's likelihood of becoming an inventor. Recent randomized controlled trials highlight the importance of mentoring programs and role-model effects on career choices. Breda and others (2023) find that even brief exposure to female role models in scientific fields significantly influences high school girls' choices of undergraduate majors. Their research shows a particularly strong effect on high-achieving 12th-grade girls, who are more likely to enroll in selective, male-dominated STEM programs in college. The gender gap in STEM enrollment narrows significantly after such intervention, the researchers find. Other policies, such as dedicated funding programs, could also help bridge the talent gap in innovation by gender and socioeconomic background.

A more inclusive education system can also accelerate the diffusion of innovation. Although the Lost Marie Curies agenda focuses primarily on identifying untapped talent for the development of new technologies, it is equally crucial for productivity growth to enhance the diffusion of those that already exist. A better-educated workforce is more capable of adopting new technologies, which means that narrowing the educational achievement gap between sociodemographic groups or local areas can facilitate the spread of innovation while reducing inequalities. Cornell University's Elio Nimier-David showed in a 2023 paper that the creation of new colleges in France during the 1990s expanded access to education and resulted in increased new business formation.

In addition, a crucial issue is democratizing access to innovation careers in low-income countries. Agarwal and others (2023) suggest that lowering immigration barriers and expanding the availability of scholarships for top foreign students from developing economies could make this possible.

The pursuit of innovation and growth does not have to come at the expense of social mobility or gender equality. By unlocking untapped talent and ensuring equitable access to careers in innovation, we can accelerate both technological progress and social advancement. Fostering a diverse pool of innovators is crucial not only for economic growth but also for a more inclusive and prosperous future for all. Democratizing innovation holds as much potential for prosperity as technological revolutions such as generative AI, with far greater benefits for inclusivity and equality. This is the unseen frontier of innovation. F&D

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A PLACE FOR HUMAN TALENT IN THE AI AGE

Marina M. Tavares

Artificial intelligence will limit some human roles but could make others more accessible

Artificial intelligence promises to expand and broaden opportunities for humanity—even as it takes over many tasks limited until recently to human ingenuity. But whether AI enlarges or shrinks the space for human talent depends on how widely AI tools are available and how ethically and fairly they are used. The challenge for policymakers is to create the conditions that will allow AI to enhance human potential.

Think of chess. For decades now, machines have been better than humans at the game. IBM's Deep Blue beat World Chess Champion Garry Kasparov back in 1997, and chess-playing engines are much more powerful today. Yet humans haven't given up playing chess. Indeed, many argue that the game is more popular than ever for many reasons, including easy access through smartphones, the internet, and social media and as a result of pandemic lockdowns and the popularity of the Netflix miniseries "The Queen's Gambit." Moreover, some believe that computers and the internet have taught humans to be better players.

AI can have a similar impact—for better or for worse—on work, education, and even sports and the arts.

Prized talent

The potential downside of AI for labor markets is well documented. As AI systems increasingly handle complex tasks, the role of human talent is at risk. Human labor may become restricted to a shrinking set of tasks, while previously prized talents—such as the ability to memorize vast amounts of information, speak multiple languages, or recognize intricate patterns—lose relevance as machines outperform humans in these areas.

Illustration by Traci Daberko

About 40 percent of global employment, across a wide range of occupations, could be affected by AI, according to IMF research. This estimate is based on the share of tasks within these jobs that AI can already perform, including translation, summarizing information, and coding. These tasks—classified as "cognitive" because they involve problem-solving and communication—were traditionally considered areas in which humans held a clear advantage. This contrasts with routine, repetitive tasks that earlier waves of automation replaced.

For instance, AI tools now assist lawyers with legal research, textual analysis, and drafting documents, which has reduced reliance on paralegals. Similarly, AI-driven translation software has decreased the demand for human translators in business, and AI systems in health care do a better job than humans at detecting cancer early through image analysis and blood screening.

Even within the shrinking range of tasks still performed by humans, AI is redefining what it means to excel. While AI tools improve productivity across the board, the Massachusetts Institute of Technology's Erik Brynjolfsson, Danielle Li, and Lindsey Raymond (2023) show that the benefits are not evenly distributed—they improve the output of less experienced and lower-performing workers, which significantly narrows the gap between them and top-tier talent. For example, in coding, AI-assisted workers with less expertise can achieve output levels closer to those of skilled developers. This leveling effect could devalue human talent as the distinction between exceptional and average performance recedes. As AI tools advance, they may even outperform human experts in certain domains, leaving less and less room for uniquely human excellence.

Human creativity

A further implication is the loss of human creativity and sense of ownership. As AI tools increasingly support humans across a broader range of tasks—such as coding, generating content, diagnosing diseases, and composing music—it is natural to rely on them too much. This dependence could have unintended consequences for innovation. For instance, a study by Fabrizio Dell'Acqua and his fellow researchers (2023) compared consultants who used AI tools with those who did not and found that the former group produced less original work. Their output showed higher quality but greater sameness, because the tools guided their efforts toward standardized solutions.

AI not only threatens to sap human innovation, it has the potential to rob innovators of the fruits of their creativity. AI tools are trained through text and data mining of vast amounts of content created by humans. Developers do not always compensate or acknowledge those who are the source of this data. This has led to numerous lawsuits by content creators alleging illegal use of copyrighted material. For example, the *New York Times* sued OpenAI for alleged improper use of its copyrighted archives, and other publishers have recently joined the case. Similarly, Universal Music Group, Warner Music Group, and Sony Music Entertainment have filed lawsuits against AI start-ups Suno and Udio over their music-generating AI systems.

AI firms often argue that the vast amount of data used to train their tools is protected by "fair use," which allows the use of copyrighted material for education, research, or commentary. But content creators have countered that the scale and scope of AI's use far exceed traditional fair use practices, which has prompted a call for new laws and regulations to ensure the fair and ethical use of their original work.

DATA

40%

About 40 percent of global employment, across a wide range of occupations, could be affected by AI.

Content creators

In part, this reflects long-standing friction between content creators and technology companies. For example, traditional news media declined with the rise of social media and search engines that poached advertising revenue. Similarly, music streaming platforms have transformed the music industry business model, diverting revenue from album sales and boosting the value of live performances. The emergence of AI tools is a new chapter in this story. Unlike earlier technology disruptions, AI tools can generate new works that mimic artists' style without their consent or payment. This leaves creators with little control over how their work is used and raises complex questions about ownership and copyright. Such appropriation of human-generated material risks devaluing original works and stifling creativity.

If all AI does is reduce employment and creativity—and undermine excellence—then how does it benefit human talent? There is more to the story. In the workplace, AI can free people from routine duties and allow them to take on more complex tasks that use their high-level skills. AI can foster and unleash human talent through broader access to individualized high-quality education. And AI can help drive scientific discovery, leading to more promising and faster outcomes.

Learning and working

This is already happening. By breaking down traditional barriers to education, AI tools are giving diverse students access to customized education previously limited by geographic, resource, or systemic constraints. For example, AI-powered plat-

forms help parents of deaf and hard-of-hearing children learn sign language, facilitating communication within families. Moreover, personalized educational tools, such as AI-driven reading and math coaches, help teachers, students, and parents identify learning gaps and tailor instruction to individual learners.

These AI learning tools hold great promise for developing economies with significant shortages of qualified teachers. Online platforms in sub-Saharan Africa have been supporting education for over a decade. Similarly, AI platforms in China are gaining popularity. This shift toward more individualized AI-assisted learning can help students with diverse backgrounds and learning styles excel in school by addressing their academic weaknesses and allowing them to thrive in their areas of strength.

In the workplace, AI can handle repetitive and monotonous tasks and streamline administrative duties so that workers can concentrate on more complex, creative, and rewarding responsibilities that need a human touch. This could benefit workers particularly in occupations that require human interaction and critical decision-making that involves people's lives. For example, in health care, AI-powered systems can assist with scheduling, billing, and patient record management, freeing up health care professionals to spend more time on patient care and complex decision-making.

Scientific discovery is benefiting as well, and AI-assisted tools have significantly enhanced productivity. A striking example of AI's transformative role is its application in protein structure prediction, as recognized by the 2024 Nobel Prize in Chemistry. This groundbreaking work revolutionized our understanding of protein folding, enabling rapid advances in drug discovery and biotechnology. Following the release of AlphaFold2, the number of predicted protein structures available to scientists surged from 200,000 to 200 million within months.

Managing trade-offs

However, these advances can come with trade-offs. A recent study in the field of new materials by Aidan Toner-Rodgers, a doctoral student at the Massachusetts Institute of Technology, found that AI discovery tools boosted research output by 44 percent. This improvement was driven largely by top researchers who used AI to automate a substantial portion of idea generation. They could then devote their time to evaluating and refining promising AI-generated suggestions—a dynamic similar to that behind AlphaFold's impact. But 82 percent of scientists in the same study reported less job satisfaction because of diminished creativity and neglect of their skills. By enabling workers to focus on creative and complex tasks, AI can foster greater fulfillment, but overreliance on automation risks making workers feel that their expertise and creativity are undervalued.

AI tools are not just for workplace efficiency and accessible education. The technology also has a demonstrated capacity to help identify potential talent in fields including sports, the arts, and academics. AI tools help scouts identify and assess sports talent by analyzing vast amounts of data so that recruiters can discover players with exceptional potential. The use of more hard data for recruiting decisions may even reduce bias. These AI techniques can make sports more inclusive—for example, by giving opportunities to young players in small towns and underrepresented regions or communities.

In creative arts education, AI tools like DALL-E, AIVA, and Amper Music allow amateurs to experiment with design and artistic concepts, providing accessible feedback and innovative techniques. These tools make arts education—once limited to formal study or costly training—available to everyone.

As AI reshapes the world of work and learning, its impact will not be evenly distributed. For some, it will unlock doors to previously inaccessible opportunities; for others, it may diminish the value of their talent. To maximize its potential, we must strike a balance: using AI ethically and fairly to complement, recognize, and enhance human abilities while addressing the systemic barriers that prevent its benefits from reaching everyone. With deliberate action, AI can help us build a future where talent isn't held back by circumstance but flourishes through collaboration between human ingenuity and technological progress. F&D

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GLOBAL TALENT AND ECONOMIC SUCCESS

William Kerr

Access to top performers sets an upper bound on a country's aspirations

Countries that attract the world's most talented people will be the most successful at overcoming mounting economic pressures from aging populations and declining productivity. Yet immigration isn't always popular. Will global talent flows—which I characterize as a "gift" in my book—come to an end? Absolutely not, but policymakers will need new frameworks.

Why the optimistic take? Despite looming labor crunches in many countries outside of Africa and some other emerging markets, public support for immigration has declined recently in the United States, Australia, Canada, the United Kingdom, much of Europe, and places beyond. Yet these declines have often been from historically high levels of support. Gallup surveys since the 1960s show that overall support in the US for immigration hit its high-water mark in the early 2020s. While the decline in support since then has been sharp, it remains comparable to the level in 2010—and above that of earlier decades.

Moreover, recent polls continue to show widespread support for employment- or economic-focused migration. A 2024 Echelon Insights poll revealed broad bipartisan support for high-skilled immigration in the US. There are important debates ahead about employment-based migration that will require fresh thinking about how to share the benefits from global talent within receiving countries more widely, but the overall tilt of public opinion remains quite supportive.

Talent's starring role

A few basic facts underscore the links between migration and talent. First, exceptionally talented people migrate at higher rates than the general population. Some 5.4 percent of workers with a college education live outside their home countries, compared with 1.8 percent of high school graduates. Inventors and Nobel Prize winners, moreover, migrate at twice and six times the college-educated-worker rate, respectively. Consequently, in many immigrant-receiving countries, an elevated and rising share of the skilled workforce is foreign-born, especially in fields related to science and engineering.

Illustration by Abbey Lossing

Moreover, the locations targeted by skilled immigrants are often special places. There has been an explosion in knowledge-based work since the 1970s and a concomitant shift in the geography of innovation. My work with Brad Chattergoon quantifies this shift for US patents, showing how six tech centers tripled their share of patents, from 11.3 percent during 1975–79 to 34.2 percent for 2015–19 (out of more than 300 metropolitan areas). Similar leading clusters are also found in creative/media industries, finance, and high-growth entrepreneurship.

Global talent plays a central role, and maybe even the starring role, in the development of these talent clusters. Coming from abroad, the untethered new arrivals for schooling or employment tend to seek the most attractive opportunities. As they help a cluster expand and become more productive, global talent strengthens the value of that cluster, making it even more attractive for the next arrivals. And because it does knowledge-oriented work for global markets, the cluster can pack a bunch of talent into one location. (You wouldn't similarly pack dentists into one city.)

There's a lot to celebrate about this process, and the productivity and welfare gains are not zero-sum. Many policymakers actively promote clusters in their countries, and global talent is a key input. Yet policymakers must address points of vulnerability.

Points of vulnerability

Discontent can emerge within talent clusters themselves. Growth is a good thing, until there's too much of it. This has been most visible in anger over rising housing prices and souring support for immigration, notably in Canada (even though it remains relatively supportive from a historical perspective). Ire also surfaces over overcrowded schools or hospitals. The truth here is complicated.

Quite often global talent is blamed for creating a crisis that exists already. For example, the root causes of inadequate housing are rarely the migrants themselves but strict regulations that stifle new construction.

Even so, policymakers must recognize the tension. Business leaders often advocate for employment-based migration because they want to employ the workers. This advocacy reveals they have the capacity to put global talent to work, and they are also quite adept at expanding production. Inventions in Helsinki or Silicon Valley can be acted upon by global supply chains. Yet other local resources—be they housing or schools—may have more restricted capacity that takes longer to expand. Policymakers must manage these tensions by controlling the pace of global arrivals and alleviating surrounding bottlenecks. Countries that excel in these complementary activities can get the most out of global talent.

Another source of discontent is tension between those outside the talent clusters and those within. Even for employment-based migration, politics matter more than economics. When some of the population is prone to distrusting, or outright disliking, highly educated individuals living in talent clusters ("the elite"), they can take an even more skeptical view of global talent ("the foreign elite").

Skilled policymakers who reduce these tensions will have greater license from the public for high-skill immigration. In the US, for example, there is growing interest in "heartland visas," which distribute global talent more evenly across the country. Placing global talent in a rural area may not yield the same productivity boost as in a top cluster, but broader political support and more shared benefits for the country are necessary politically.

Will she say yes?

In a future contest for global talent, countries will soon realize they must court migrants, not simply let them in. Global talent flows are essential for attracting frontier talent to emerging fields, like AI. Even if the current environment is skeptical toward immigration, the wise policymaker will avoid near-term choices that have lasting negative consequences. What are some key considerations for attracting global talent?

First, the "education pathway" needs attention. Employment-based migration is intricately connected to schooling decisions. Many employers use work visas to hire young talent coming out of university, and the work of Takao Kato and Chad Sparber demonstrates how the highest-quality students select schools based on future labor opportunities. School and work policies frequently fit poorly together, creating painful transitions or even expelling the very talent a country would most like to keep and has often invested public funds into educating. Policymakers need to ensure that the parts of the immigration pipeline—school visas, work visas, permanent residencies, and so forth—are well balanced.

Second, pursuing global talent is a complement to local investment. Choices about where to attend school or launch a career often resemble investments akin to buying a home. This long-term horizon means global talent prioritizes many of the same attributes of locations as natives do—like good schools, quality infrastructure, and safe neighborhoods. Moreover, the businesses created by immigrant entrepreneurs draw upon the native workforce. Thus, pursuing global talent is not a substitute for investing in local schools and public goods.

Third, policy uncertainty deters long-term invest-

ment. Uncertainty stops us in our tracks when making big long-term choices, be they opening a chemical plant, getting married, or emigrating for school and career opportunities. Many immigration systems, including the US approach, have been functional without necessarily being user friendly. That was OK so long as the migrants were assured that their investments would ultimately be recognized and appropriately rewarded. When immigrants lose faith in the system's longevity and potential to deliver on its promises, a country's attractiveness really declines. Stable policy foundations are essential for attracting top talent.

Fourth, immigration policies should be designed to be flexible. Some countries, such as Canada, are capable of "immigrant engineering"—a shorthand way of describing a capacity to experiment with policies, tweak them based on observed outcomes, recalibrate as experience reveals new information, and so forth. The US, by contrast, makes large-scale changes once every few decades. Policymakers in rigid political environments should design flexibility into their policies, such as automatic adjustments to visa caps based on easily indexed data, like population growth.

Finally, immigration policies must allocate scarce slots effectively. Countries differ in their priorities for immigration and selection mechanisms. For economic- and employment-based immigration, many systems use lotteries or first-come-first-served procedures that don't prioritize truly rare skills. Policymakers should review their procedures to ensure the best candidates are selected. This will maximize the economic impact of talent infusion and strengthen political support for immigration.

And yes, to the subhead, women are more likely than men to be represented in global talent flows. By 2010, the stock of female high-skilled migrants in Organisation for Economic Co-operation and Development countries had surpassed the male stock. As female enrollments in colleges and universities continue to outpace male enrollments, this differential may continue to widen. Policymakers will be well served if their mental image of global talent flows captures this reality and contemplates the features women will value in potential destinations.

Competitive, winning teams

Farsighted leaders want their countries to successfully navigate tomorrow's challenges, be they aging populations, declining productivity, climate degradation, or escalating global political tensions. Constructing a competitive, winning team is vital to this dynamic national success, just as it is for businesses. As they navigate this shift toward knowledge-based work, firms have increasingly elevated "people functions" from being mostly about back-office support for employee hiring and HR compliance to having a voice in strategic discussions. Access to talent often determines what strategy a company can take, and thus the two must be developed jointly. The same is true for countries.

What about the welfare of sending countries? Some countries have lost out because of talent moving abroad, while many others have gained (sometimes phrased crudely as "brain drain" versus "brain gain"). A lot depends on the strength of networks between countries and whether businesses in receiving countries want to engage economically with global talent's home countries. Some sending countries have deployed policies to strengthen these linkages, as my book describes. Surprisingly, the strongest benefit of global talent flows for migrant-sending countries may come through the greater schooling of young people who hope to migrate abroad, because ultimately many do not migrate after all.

As we move from considering all workers, to college-educated workers, to inventors, and to Nobel Prize winners, global talent's share of the workforce rises continually. While national strategies countries take toward advanced technologies are shaped by many domestic and international features, access to global talent sets an upper bound on how far a country can set its aspirations. F&D

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IX - C/D
Subject - Chemistry
Teacher's name - Sumetra Banik
XI (Science)
Chemistry

THE POWER OF EDUCATION POLICY

Amory Gethin

Education has been and can continue to be at the center of global poverty reduction

The world economy has experienced a remarkable transformation over the past four decades. Global GDP per capita doubled in real terms, driven by the rise of China and India and by significant growth elsewhere. Much of these gains accrued to the global poor. The proportion of the world's population living below the international poverty line of $2.15 a day dropped from 44 percent in 1981 to 9 percent in 2022, according to the World Bank.

What was behind these developments? Recent research points to education as one of the main drivers of inclusive growth. There has been an unparalleled expansion of access to schooling over the past 50 years, in high-income and low-income countries alike. This generated large productivity gains, especially for those living in poverty. Education accounts for fully half of total economic growth and two-thirds of real income gains among the world's poorest 20 percent since 1980, based on my findings in a recent paper (Gethin 2023).

This calls for a continued focus on expanding access to education. New technologies such as AI offer enormous opportunities for productivity growth and innovation. Yet the size

Students pursue their education at the Netaji Subhas Vidyaniketan school in Tripura, India.

ABHISEK SAHA/MAJORITY WORLD/UNIVERSAL IMAGES GROUP VIA GETTY IMAGES

of these gains and who will benefit depend on the creation of a sufficiently large skilled labor force. Universal basic education has been at the center of education policy in many developing economies—with positive results. Now more than ever, there is a need to expand access to high-quality secondary and postsecondary education, for both equity and efficiency. Education ensures not only that countries can use global innovations efficiently but also that they share the benefits broadly.

Education diminishes poverty

Economists have long debated the importance of human capital in economic development, yet little is known about how well education has lifted poor people's standard of living. To take on this research challenge, I built a microdata base consisting of surveys conducted around 2019 by statistical institutes in 150 countries. The surveys covered labor forces and individual incomes. I combined this data with historical information on the evolution of educational attainment since 1980.

This enabled me to measure for the first time the relationship between income and education for a sample representing 95 percent of the world's population. For each country and for different levels of education, I could thus calculate how much individual incomes increased as people received more education. It also allowed me to observe how education shapes income inequality—a key to estimating the effect of education on reducing poverty.

This analysis shows that education has been a powerful driver of inclusive growth over four decades. The doubling of global income per capita between 1980 and 2019 would have been only half as large without advances in educational attainment. The research also shows that education was responsible for 60–70 percent of real income growth among the world's poorest 20 percent. In the absence of considerable efforts to expand access to schooling, the world would be a much poorer and much more unequal place.

Why has education been so successful at reducing global poverty? Unexpectedly, basic education alone does not explain these large effects. Higher education also played a major role. Expanding access to higher education allows a broader group of workers to share high-skill jobs. At the same time, it frees up job opportunities for low-skilled workers.

For example, take a country like India or any of a number of sub-Saharan African nations with a large traditional sector and a small modern sector. In such economies, many workers hold highly unproductive jobs in agriculture. As education expands, some of these workers can take on more high-skill jobs.

DATA

70%

Education is responsible for up to 70 percent of real income growth among the world's poorest 20 percent since 1980.

But the agricultural workers who stay behind also become more productive. If too many people are employed on the same plot, the marginal productivity of each individual may be quite low. When some people leave, the productivity of the remaining farmworkers rises as total output remains largely unchanged, which drives up their wages.

Workers in both categories therefore benefit from schooling—and low-skilled workers in the traditional sector may even benefit more. These effects are enormous and play a key role in shaping the distribution of economic gains from education. They should be at the center of any debate on the role of education in improving economic efficiency and equity.

This phenomenon highlights another important point. The aggregate and distributional effects of education depend on the evolution of employers' demand for skilled labor. In recent decades, large technological advances disproportionately benefited highly skilled workers. Such skill-based technological change was a major driver of rising inequality in the United States, where college attendance did not expand fast enough to keep up with growing demand for skilled workers.

This interaction between education and technology has played an important role in generating income gains for poor people worldwide. Without technological progress, education would have had significantly lower effects on economic growth. At the same time, without educational expansion, technological change would have generated little growth, and this growth would have benefited a much narrower set of skilled workers, especially in low-income countries. In a world with growing interdependence between skills and technology, education and innovation policy should go hand in hand. In other words, it is not so much that education has driven economic growth significantly more than technological change, trade globalization, or other factors. Rather, the combination of schooling and other major economic transformations has been the key to reducing extreme poverty.

Beyond basic education

International institutions and governments have put universal basic education at the center of the policy agenda for poverty reduction for two reasons. First, there is a general perception that returns to human capital are decreasing, with basic education generating the highest gains. Second, improving access to basic education disproportionately benefits low-income households, especially in less-developed economies where access to higher education is restricted to an elite few.

"Failure to expand access to education would represent an enormous missed opportunity to enhance inclusive growth."

In many countries, however, both assertions may turn out to be wrong. My research suggests that, contrary to conventional wisdom, returns per year of schooling in terms of a person's income are not greater at lower levels of education. In India, for example, a year of primary education will increase a person's earnings by 2–3 percent; a year of secondary education, by 6–8 percent over the earnings of someone with only primary education; and a year of postsecondary education, by more than 13 percent over those of a person with secondary education alone.

These are huge differences with major implications for the macroeconomic effects of different education policies. Moreover, expanding access to higher education may have significant indirect positive effects on less-educated workers, as my analysis found. Other research suggests that these spillovers are particularly large for postsecondary education because it is not easy to replace college-educated workers with other types of workers. Put differently, the high returns to postsecondary education in a country like India point to a substantial unmet demand for highly skilled labor. Meeting this demand may be the key to both enhancing economic growth and reducing inequality.

Of course, this does not necessarily imply that developing economies should redirect their resources toward expanding access to higher education. There are important trade-offs. Higher education is generally more expensive per student, and highly skilled workers are more likely to emigrate after completing their studies. The general point is that in shaping education policy, authorities should pay close attention to the dramatic differences in the returns to different levels of schooling and to the projected evolution of labor demand.

Quality versus quantity

Another debate focuses on whether to continue expanding access to education or to concentrate on improving the quality of education. Internationally comparable test scores show particularly low education quality in developing economies. This has led international institutions and economists increasingly to emphasize the need to prioritize quality to promote economic development.

However, my research shows that education quantity, not quality, was at the center of global poverty reduction. From 1980 to 2019, the share of the world's citizens with no schooling declined from 35 percent to 15 percent, while the share of adults with at least some secondary education grew from 25 percent to 60 percent. Meanwhile, education quality based on test scores stagnated.

India's District Primary Education Program, implemented in 1994, is particularly illustrative. The University of California San Diego's Gaurav Khanna found that the program significantly expanded access to primary education, with no effect on education quality (Khanna 2023). Yet it generated a 13 percent increase in earnings per year of schooling. In a world where two-thirds of global poverty reduction since 1980 was driven by expanded access to schooling, it seems unlikely that focusing on quality alone will be enough to promote further inclusive growth.

Policymakers and economists sometimes do not evaluate education policy the way they do other economic factors; they assume that education has a fixed average return of 10 percent. In the presence of technological progress, however, the returns are much larger. Failure to expand access to education would represent an enormous missed opportunity to enhance inclusive growth.

Authorities should thus look to the future when it comes to education. Given the major developments in AI and other technologies that are coming, it is likely that expanded access to education will be particularly beneficial, perhaps even more so than in the past. This also means that policymakers should actively promote policies that encourage the adoption of these technologies. There is a close interdependence between education and other dimensions of any economy. Education alone is unlikely to be particularly useful unless linked with other complementary policies. F&D

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THE VALUE OF VOCATION

Maria Petrakis

Vocational skills training has multiple economic benefits

Folorunso Alakija can thank a Pitman's secretarial studies diploma for setting her on the path to her position as one of Africa's richest women. The training led to a job as an assistant to executives and bankers before she shifted gears to study fashion design and started her own brand. She then branched out into real estate and oil exploration, among other things, amassing an estimated $1.8 billion fortune, according to Forbes.

Once they succeed, many billionaires make large donations to universities, usually the ones they attended. In 2018, Alakija donated the Skills Acquisition Centre at the Yaba College of Technology in Lagos to teach fashion design, welding, pedicure and manicure, hairdressing, makeup artistry, and shoe- and hat-making.

"We all can't be in the office under air-conditioners executing white-collar jobs," the *Nation* newspaper quoted Alakija as saying during the school's dedication ceremony. "You can be your own boss and build more confidence in yourself and put food on the tables of many more families as a result of the skills you have acquired."

Alakija's trajectory shows how a university degree is not always the key to success. Vocational training is gaining recog-

A man works wood at a technical and vocational training institute in Addis Ababa, Ethiopia.

BRITTA PEDERSEN/PICTURE ALLIANCE VIA GETTY IMAGES

nition as a viable alternative to a college education: Not all professions demand university studies to flourish. Switzerland, Germany, and Finland have a long history of successfully incorporating vocational training and support in preparing students for the workforce. From Bill Gates to Mark Zuckerberg, many Big Tech leaders dropped out of college and went for hands-on experience in building their businesses.

The field of vocational training is particularly relevant for developing economies, where university degrees obtained either at home or abroad are out of reach for many—or are not the best fit for employer needs. And unemployed young people present a problem for governments.

An August 2023 report by the World Bank, the International Labour Organization, and UNESCO found that technical and vocational education and training in low- and middle-income countries do not match the skills needed in the labor market. These countries are also unprepared for a large rise in future demand for these skills.

In Burundi, Mali, and Uganda, the number of secondary technical and vocational education students is expected to more than quadruple over the next two decades; in Niger, the number is expected to rise tenfold. "Already, many of these countries face increasing pressure from high shares of youth not in education, employment, or training," the report says.

Research shows mixed success for vocational training programs, says Lisa Corsetto-Poon, policy lead at the Abdul Latif Jameel Poverty Action Lab. Designing programs carefully to include features that show the most promise and are appropriate for the given context is essential, she adds. Known as J-PAL, the Massachusetts Institute of Technology–based research center reviewed 28 studies on vocational and skills training programs in countries ranging from Argentina and Bangladesh to Türkiye and the US.

"Many labor markets see a mismatch between the types of jobs that college graduates have prepared for and expect and the job types that are actually hiring," Corsetto-Poon said. "But vocational training programs don't always successfully bridge this gap." Vocational training programs that are well targeted toward in-demand sectors ideally can bridge the gap and provide a more viable alternative to a well-paying job than a pricey university degree, she said.

Credible skills signal

Vocational and skills training programs aim to build a strong labor force by preparing people for jobs in a particular occupation or sector. Training, which can include practical work experience, usually leads to a certification or diploma that can help people get a job by providing "a credible skills signal" to employers, J-PAL's research shows.

Students attend a vocational training class in Dhaka, Bangladesh.

FATIMA TUJ JOHORA/BLOOMBERG VIA GETTY IMAGES

A study in Uganda showed that the income gains for people offered free six-month vocational training were both larger and more sustained over time than for people offered a wage subsidy of $50 a month for six-month on-the-job apprenticeships.

This difference is probably a reflection of vocational trainees' acquisition of more certifiable skills and their ability to get a new job more easily than apprentices who became unemployed, according to the study.

In a follow-up study done after the COVID pandemic, the Ugandan researchers found that vocational trainees were more likely to lose their jobs at the beginning of the pandemic, but they recovered and ultimately earned more over the course of the pandemic than peers not offered the training. The research suggests that this probably resulted from trainees' greater sector-specific prepandemic experience. And because they could certify their skills, they could move more easily across employers within a sector.

The study showed that because many low- and middle-income countries lack the social insurance systems of wealthier countries, the ability to move quickly back into the workforce is essential. J-PAL uses randomized controlled trials—a methodology borrowed from drug and medical treatment testing that earned a Nobel Prize in economics for its

cofounders, Abhijit Banerjee and Esther Duflo—to inform and encourage more research on vocational training, in partnership with governments, the private sector, and civil society organizations.

Corsetto-Poon points to promising sectoral employment programs in the US, which led to substantial and persistent earnings increases. These programs train job seekers, typically people with low incomes and those from nontraditional backgrounds—for example, those who have not graduated from high school or college—for high-quality employment in industries likely to have a strong demand for local labor and opportunities for career advancement.

One such program operating in the area of health care, Project QUEST, increased participants' earnings and their employment in higher-quality jobs. A long-term evaluation showed that the average annual earnings of program participants was 26 percent higher six years later and 15 percent higher eleven years later, compared with those who did not participate.

"Many of the common features of the most successful sectoral employment programs—like providing an industry-recognized certification, integrating soft skills training, and providing strong connections to employers—are the same features we see in promising program models outside of the US," Corsetto-Poon said.

Growing middle class

J-PAL's research shows that the cost of vocational training programs can vary widely, from a few hundred dollars to more than $10,000 per person trained. Low- and middle-income countries spend less than 0.2 percent of GDP on vocational training—less than half what high-income countries spend. The World Bank, International Labour Organization, and UNESCO report suggests that these programs will need to tap private financing.

Investors might not be too hard to convince. Economic growth in Africa and Asia is making expansion to those areas more attractive to companies such as Pitman's, now owned by LaunchLife International, a franchisor of educational platforms.

A secretarial course at Pitman's might have been out of reach for most Nigerians in the 1970s, when Alakija took her course in London. Now Pitman Training is eyeing bringing its courses to Africa, drawn by a rapidly growing African middle class in an economy expanding faster than any other part of the world. It aims to build on a legacy of helping women enter the workforce. It already has partners in Nigeria, Zimbabwe, Kenya, and Ghana, and its offerings range from office and secretarial skills to software and web development.

Alternative paths

Dropping out of a prestigious university to launch a business is not the same as choosing vocational training, but the number of successful entrepreneurs opting for alternative educational paths bolsters the argument that university may not be the best, or most affordable, option for everyone.

Apple cofounder Steve Jobs took a calligraphy course that inspired the design of the Apple Macintosh computer after dropping out of a highly regarded but expensive college his family couldn't afford.

Soichiro Honda founded his eponymous car manufacturer after quitting school and becoming an apprentice auto repairman. TV chef Jamie Oliver began with a vocational qualification in home economics. Baruch College dropout Ralph Lauren sold ties before launching his own fashion brand.

Just 22 percent of Americans said that college is worth the money, especially if it means taking out loans, according to a Pew Research Center study. Almost half said the cost is worth it only if a student doesn't have to take out loans; 29 percent said the cost is not worth it at all.

The growing cost of a university education weighs heavily on voters. Ahead of the November 2024 election, US President Joe Biden provided almost $180 billion in student debt relief, helping 4.9 million borrowers.

Facing an election in 2025, Australian Prime Minister Anthony Albanese announced a $A 16 billion (about US$10 billion) debt cut for 3 million Australian students and capped indexation on education loans after high inflation saddled university graduates with a 7.1 percent payment increase.

Corsetto-Poon says that both universities and vocational training face big challenges in keeping up with the changing dynamics of the labor market and staying relevant.

"But the fact that vocational training is often more accessible, given lower costs to participants and shorter time commitments, means that these programs could be promising alternatives to university studies," she said. "Vocational training programs should be thoughtfully designed to maximize their potential and avoid negative impacts on workers as the landscape of jobs changes." F&D

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THE RIGHT TO DREAM

Andreas Adriano

After rising from poverty to parliament, Brazil's Tabata Amaral wants future prodigies to succeed because of policies rather than luck

"If I'm here today, it's because of public schools' math olympiads," says Tabata Amaral. By "here" she means her office in Brazil's House of Representatives, where the 31-year-old, already serving a second term, found time to speak with F&D in a video interview on the same day that country's 2025 federal budget was up for a vote.

As a science child prodigy turned education activist and political rising star, Amaral's life exemplifies both the possibilities of individual brilliance as well as the real-life challenges of developing talent, especially for children from humble backgrounds: Before spending on labs and scholarships, it starts with broadening their horizons, or achieving "the right to dream," as Amaral puts it. "If you don't even know something exists, how will you dream about it?"

The daughter of a housekeeper and a bus ticketing agent, Amaral was born in a poor neighborhood on the outskirts of São Paulo, Brazil's largest, richest, and very unequal city. A brilliant student from an early age, at 11 she won her first medal in the Brazilian public school mathematical olympiad. The prize was joining a supplementary weekend course, and it came with a small pocket money stipend. "This showed me, at 11, that the world was big," which at the time meant to be able to go to the city's affluent neighborhoods for the first time. "It gave me the right to dream about a different future."

She went on to win more than 40 medals in math, chemistry, robotics, astronomy, and astrophysics olympiads, in Brazil and abroad (always as the only girl on the national team), and a full scholarship to an elite high school. She became the first in her family to finish secondary school. Soon after getting into Brazil's most prestigious university to study physics, she won full scholarships to the California Institute of Technology and to Columbia, Harvard, Princeton, Pennsylvania, and Yale universities.

Tabata Amaral is pictured in São Paulo, Brazil.

PATRICIA MONTEIRO/BLOOMBERG VIA GETTY IMAGES

She chose astrophysics at Harvard. Four days after learning she had been accepted, her father, who had a history of mental health problems and drug abuse, committed suicide. Feeling guilty about leaving her grieving family behind, she considered dropping out. "It felt like life was telling me to stop being a fool and go back to where I really belonged." She credits former teachers with getting her back on track. "They said that if I quit, that opportunity would never happen again to a poor girl from Brazil."

Turning point

In her third semester at Harvard, as part of general education requirements, she signed up for a course on comparative politics in Latin America. It was a turning point. "It's like it was about my life, inequality in Latin America. Why am I here and others aren't?" That class's professor joked that Amaral, who had studied about a year and half of English before attending Harvard, had "the worst English and the best questions." Despite the pile of science medals, she changed majors from astrophysics to political science and graduated magna cum laude with a thesis on the effectiveness of education reforms in Brazil—all while working at various jobs to support her family.

Returning home in 2014, she first founded an education advocacy organization, which soon won awards and international funding. In 2018, aged 25, she ran for Congress and received the sixth highest number of votes among the 70 lawmakers elected in São Paulo, the country's most populous state. In 2022, she was reelected with a third more votes than the first time. Last year, she ran for mayor of the city of São Paulo. Although she finished fourth in a bitterly fought contest, she almost doubled her votes from the previous election.

Once in Congress, one of Amaral's first priorities was to secure funding for the math olympiads that gave her a first glimpse of a larger world. Created by the country's science and technology ministry in 2004—the year she won that first of many medals—the program has suffered deep budget cuts over the years, despite evidence suggesting that when students win a science medal, their whole school sees lower truancy and higher college attendance later. These programs are "a cheap and effective policy," she says.

Keeping the math competitions alive may have a deeper, personal meaning for Amaral. The minister who made them possible happens to be the father of her boyfriend of five years, João Campos—also a young rising politician, whom she first met as a fellow lawmaker and who last year easily won reelection as mayor of Recife, capital of Brazil's northeastern state of Pernambuco.

"My trajectory is a statistical miracle. So much could have gone wrong, and I've been very lucky," Amaral acknowledges. She therefore focuses on creating mechanisms that would allow other gifted students to rely on policies instead of fate. The first part involves broadening their horizons and helping them develop the capacity to dream. "When you're poor, you grow up without references or role models. You don't even know how to get into college. We need to show children that the world is big and that you can experience it through education, sports, and culture."

Her mayoral campaign education proposals included full-time schooling, public foreign language programs, and foreign exchange programs for young people. "It's cheaper to send a kid abroad for six months than eventually having to maintain them in jail for the same amount of time later on," she says, adding that this is a factual, not rhetorical, comparison.

If getting kids to school is difficult, keeping them there until graduation presents a different set of challenges. A program Amaral drafted established two-pronged funding for low-income secondary students: a monthly pocket money stipend and a savings fund accessible only after high school graduation. She knows firsthand how even a small amount of money can change the harsh reality of children dropping out of school to seek work and help at home. "When I got that first small salary, at 11, it showed my family that I could earn money while studying. It was very symbolic," she says.

Dreaming big

She worked with a group of economists to design the project, based on evidence showing that school absenteeism and lower education levels ultimately cost governments more. "A student that drops out of high school has a life expectancy up to four years shorter, is less productive, and is more likely to go to jail or to become seriously ill," she says, quoting research from economist Ricardo Paes de Barros, who estimated the overall cost of truancy to society at 3 percent of GDP. Effective since March 2024, the national program is already benefiting over 3 million students.

Next she wants to expand the program for low-income college students, knowing well that many of the same problems are compounded at the next phase. Poor students need to overcome social barriers and stigmas—"I heard so many times that I would probably end up a drug addict like my dad"—as well as financial hurdles unknown to someone from the middle class. "When that kid finally starts dreaming big, they might be very hardworking and have clear objectives," she says. "But at the end of the day, if you don't have money for the bus fare, it's over." F&D

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Driving Change

Dani Rodrik

THE DEVELOPING WORLD'S VIBRANT RESEARCH IN THE FACE OF LIMITED RESOURCES OFFERS VALUABLE GLOBAL INSIGHTS

For too long, Western institutions have shaped empirical research and policy recommendations. Authors based in developing economies have a far too small footprint in top economics journals. They account for only 7 percent of articles in the top 10 journals of the profession, as Ernest Aigner, Jacob Greenspon, and I show in a forthcoming paper, even though their collective weight in the world economy exceeds 60 percent (measured by their global GDP share at purchasing power parity). The representation of women economists on all fronts is lower still.

Even when research is published, getting it noticed is a major challenge. Promoting research within academic circles is one thing; bringing it to wider attention is quite another. Translating research findings into tangible policy requires sustained engagement with policymakers and the public—a demanding process that competes with researchers' limited time and resources. This creates a difficult balance: While researchers face pressure to produce new work, the crucial task of ensuring that existing research influences policy often remains underfunded and undervalued.

Global relevance

Empirical research produced in developing economies is not only locally relevant but also holds critical insights for global challenges. From climate adaptation to conflict resolution, pressing world issues first manifest intensely in developing regions.

For example, the common assumption is that formal banking is the best path to financial inclusion. Yet empirical research in developing economies has revealed how informal saving groups and mobile money can sometimes serve local needs better. Similarly, while many education policies focus on building more schools, local research has shown that in some contexts, providing bicycles or improving access to restrooms for menstrual hygiene can be more effective at improving attendance.

This context-specific knowledge is vital for policy effectiveness. When policies are designed based on ground-level evidence, they are more likely to work. Moreover, local researchers have access to communities and context, leading to richer and more accurate insights.

Beyond improving policy design, empirical research in developing economies can advance economic theories. It allows us to test the universality of economic principles and uncover new mecha-

nisms that might be less visible in developed economies. This diversification of evidence and perspectives strengthens the entire field of economics, making it more robust and globally relevant.

Women economists

Women economists represent women across the world, almost half the global population, often covering important topics and ideas that have been historically underexplored. Working as economists, they face additional barriers, navigating both institutional constraints and gender-based challenges.

From limited access to higher education and labor markets to balancing work and motherhood, they face significant obstacles to produce compelling, timely, and competitive research, often covering topics that directly affect women's lives and improve their standard of living. Many women economists are advocates and activists, using economic reasoning to advocate for a more equitable world—a cause that remains as vital as ever.

The International Economic Association's Women in Leadership in Economics Initiative (IEA-WE) aims to amplify the voices of women economists and help overcome some of the barriers they face. Since its inception in 2023, the project has supported research and facilitated the publication of articles on a wide range of topics and ideas that are often overlooked.

From the societal impacts of sovereign debt on the elderly to the effects of extreme heat on business delinquency, these articles showcase the important work that women economists are conducting in their respective countries and foster a more inclusive global economic narrative. By bringing this research to light, the IEA-WE hopes to inspire more young women to pursue careers in economics and public policy.

We are pleased to partner with F&D to bring you conversations with four distinguished economists: Ipek Ilkkaracan, Rose Ngugi, Marcela Eslava, and Rumana Huque. Their work is reshaping economic discourse in their respective regions. Through their research, insights, and lived experiences, these remarkable scholars offer invaluable perspectives that deepen our understanding of global economic challenges and their solutions. **F&D**

DANI RODRIK *is the Ford Foundation Professor of International Political Economy at Harvard's John F. Kennedy School of Government and past president of the International Economic Association.*

Illustrations by John Jay Cabuay

"When a male colleague asks, Where are the new jobs going to come from? To me, it's obvious."

Ipek Ilkkaracan:
Purple Gain

It was late afternoon sometime in 2009—she can't recall exactly, but it was in a conference room in her native Istanbul, brimming with travel-weary international economists itching to get to the bar after a long day of lectures on the green economy, hers being the last. But as she walked up to the podium, she could see them slowly dispersing, having heard all they wanted to hear. Desperate to pull them back, it just came to her. She leaned into the microphone and said it: "For a truly sustainable economic order, the green economy is not enough. We also need a purple economy." Ears perked up, drink orders were put on hold, and thus the term "purple economy" was born.

Ipek Ilkkaracan's idea to use the word "purple" came from its association with the women's movement in Türkiye, but she soon learned that the color also symbolized feminist movements in several other countries. So while the green economy aims to increase sustainability through environmental policy, Ilkkaracan's purple economy has come to symbolize the fight to make economies more sustainable through increased gender equality and investment in the social care infrastructure.

Ilkkaracan is a professor of economics at the Istanbul Technical University Faculty of Management, and her research focuses on labor, development, and feminist economics. "I always identified as a feminist in my college years. But my commitment to feminist economics grew stronger as I became a mother myself and started engaging in intensive unpaid caregiving, while simultaneously trying to move ahead in my career."

Feeling betrayed by her own discipline's blind spot in this area of production so vital to the well-being of people, Ilkkaracan began digging into the economic benefits of caregiving work. The research was quickly recognized by UN Women, the International Labour Organization, and governments worldwide looking to increase employment opportunities and growth, because caregiving services, Ilkkaracan says, offer more job creation potential than those in any other sector.

"In the Turkish context, we compared the potential of government spending for employment creation when public funds are spent on the care services sector—early childhood care, for example, versus the construction sector. And we find that the number of jobs created through spending on early childhood care services and preschool education can create three times more jobs than the same magnitude of public funds being allocated to the construction sector."

And when asked about the potential job losses to technology, Ilkkaracan says the answer to that labor issue also lies within the purple economy.

"There are sixteen and a half billion hours of unpaid work performed every day around the globe, within the domestic sphere, doing care activities, household production. If we were to shift only half of that to the paid sphere, it would amount to hundreds of millions of new jobs. So when a male colleague asks, Where are the new jobs going to come from? I just want to laugh, because to me, it's obvious."

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Rose Ngugi:
Getting an Edge from Data

Life is a sequence of events. Sometimes the smallest things, those seemingly inconsequential moments in our lives, have a lasting impact. "In those days, we didn't have anything called economics in schools. But then somebody came to our school to talk about some new subjects. I didn't know anything about it, but I was like, okay, let's venture into this thing called economics."

Rose Ngugi emerged from that Kenyan high school hungry to learn more—because, "You may think when you see people in the market buying and selling, that's all it is, but then you realize it's an ecosystem within which we all operate. So by understanding the what and the why, it helps you to see where the interventions are needed to make your society better."

Now Dr. Ngugi, she went on to study economics at the University of Nairobi and at Birmingham University in the UK. She also did a six-year stint at the IMF before returning to Kenya to help the national government with its development agenda under the devolution process, which gives county governments more autonomy. In her role as executive director of the Kenya Institute for Public Policy Research and Analysis (KIPPRA), Ngugi and her team provide sectoral data to these counties, in the form of indices that are used to gauge the impact and effectiveness of the policies they implement.

"The indices are working magic," Ngugi says. "They help the counties focus their attention on the areas that we can see are not performing very well." Good data is a rare commodity in many parts of Africa, but what makes Ngugi's indices even more valuable is that they are Kenya-centric, measuring real-life activities that are relevant to local communities, like the informal sector, which employs 80 percent of the population.

"If we want to talk about growth in this country, you cannot achieve growth without knowing where the key sources of growth are," she says. "We have a lot of youth going into these informal micro and small enterprises. And then you ask yourself, Are they productive enough? Are they creating decent jobs? So you need to look at micro and small enterprises as the bedrock, and then support it. You can only do that by going to the counties, understanding the environment within which they are operating, and that way, you're able to focus your policy directly on the issues, the nitty-gritty of the issues at the county level."

Ngugi says the indices are helping 47 counties countrywide build stronger local economies, which supports the national government's bottom-up approach to Kenya's economic transformation.

Sectoral indices that gauge the impact of government policy are working magic, Ngugi says.

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Marcela Eslava:
Rethinking Social Protection

"I think where you grew up, definitely provides you with insights that other people may not have. My daily life feeds me with questions because I see the problems all around me."

Math skills came to her naturally early on, but the problems she was drawn to had more to do with social issues, which were plentiful in Bogotá when she was in school. She couldn't believe how diverse her country was.

"Not the good kind of diversity, but the bad kind of diversity—the inequality kind of diversity that's not rooted in people just being different, but in having different opportunities. And so I think being part of that environment naturally makes you think about the combination of society, economy, politics, policies—and that was my case."

So economics ticked all the boxes for Marcela Eslava. She went on to study at Universidad de Los Andes in Bogotá, where she now teaches, and holds a PhD from the University of Maryland. And while Eslava was initially motivated by the social inequities she witnessed growing up in Colombia, she now heads the Latin American and Caribbean Economic Association (LACEA), which facilitates the exchange of ideas among economists and policymakers for the entire region.

Eslava's research has taken her down many paths, but there are a couple of recurring themes. Low income and high inequality together form the basis of what she calls the Latin American development problem. "I've lived in Latin America my whole life, and this is the reality we face every day, she says. "It has important implications for the people that surround you. You see poverty. You see social unrest and discontent."

And in those conditions, people typically work in informal jobs and don't contribute to the social security system. So no pension or health care. They also earn very low wages. Eslava says they are the survival entrepreneurs and account for half of Latin America's workers, who would otherwise be eligible for social security benefits under the law.

"Our social security systems are very dysfunctional in the sense that even though in the written law they provide reasonable security for people, there is a very large fraction of the population that is not being covered by those provisions."

It's time to redesign those systems to reflect today's reality, Eslava says, to protect people based on the risks they face rather than how they make their living.

"Health care should kick in when you get sick, not when you get sick and you're formally employed. But you need to fund that, so we need to rethink the way in which we finance social protection. And that means a whole new vision on taxes and contributions that governments raise."

"Health care should kick in when you get sick, not when you get sick and you're formally employed."

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Rumana Huque:

Coughers and Coffers

Big Tobacco might seem an anachronism to people in the West—it feels as if that battle was fought and won years ago, for the most part anyway. Not so for developing economies. "Tobacco use is really high in Bangladesh—and not only in Bangladesh, but throughout Southeast Asia. The latest round of Global Adult Tobacco Surveys, done in 2017, shows that 35.3 percent of people 15 years of age or older use tobacco products."

Rumana Huque never liked the smell of her father's cigarettes in their Dhaka home. But smoking is what men do in Bangladesh, and the economy depends on it. According to the National Board of Revenue, between 9 and 11 percent of all tax revenue comes from the tobacco industry.

"When I started my PhD at the University of Leeds, I started working in the field of tobacco control," Huque says. "I found the massive negative health impacts of tobacco, but also realized the economic burden of tobacco consumption in Bangladesh and how the tobacco industry is manipulating the entire landscape of policymaking." Huque majored in health economics at the University of Dhaka, where she now teaches.

The health implications of tobacco consumption are no secret; it kills more than 160,000 Bangladeshis every year. So while the revenues are significant, Huque did the numbers, and the taxes collected from tobacco products don't come close to covering the costs of treating tobacco-related illness. Huque says the country's dependence on tax revenue from tobacco is pitting government agencies against each other.

"The Ministry of Health—their priority is, of course, the public health gain. But the National Board of Revenue—we cannot deny that they rely on tobacco taxation for their tax revenue. Still, they have to find alternate sources of tax revenue, not only relying on tobacco taxation. So there is a trade-off, and they have to take the decision for the bigger interest of the population of the country, and that definitely is the public health gain."

In a country where so many people smoke, nonsmokers face risks too. Huque and her colleagues conducted a study on 1,300 school-age children and found that 95 percent had nicotine in their saliva, indicating exposure to secondhand smoke. Other studies suggest that many of those children will end up using tobacco products themselves. So round and round it goes.

Huque's father eventually developed a nasty cough that forced a visit to the family doctor. "He took it very seriously, and he realized how it was impacting his health and that he didn't want his children to follow him and be smokers in the future. So he quit smoking, and later none of us smoked in my family."

Huque says it's time for Bangladesh to rethink its tobacco tax structure, because taxation is the most cost-effective way to discourage the use of tobacco products.

Huque says it's time for Bangladesh to rethink its tobacco tax structure.

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Writing by **BRUCE EDWARDS**, *who is on the staff of* Finance & Development, *based on reporting by* **RHODA METCALFE**, *a freelance journalist. Visit www.imf.org/podcasts to hear interviews with all four economists.*

How Animal Spirits Affect the Economy

Joel Flynn and Karthik Sastry

VIRAL NARRATIVES COULD BE THE MISSING LINK BETWEEN EMOTIONS AND ECONOMIC FLUCTUATIONS

A zebra herd gathers on the bank of the Mara River, Kenya.

GETTY IMAGES/WLDAVIES

Storytelling is central to how we interpret economic events. We recall economic history through haunting images of anxious crowds waiting to take money out of banks during the Great Depression or dejected office workers carrying cardboard boxes out of Lehman Brothers in 2008. We gauge inflation by comparing shopping baskets with friends and family. We grapple with the consequences of artificial intelligence by channeling our hopes and fears into science fiction.

But do stories themselves influence the economy? This idea has a long precedent in economic thought. John Maynard Keynes wrote extensively about how "animal spirits"—instincts and emotions that influence behavior—prompt people's economic actions, like spending or investing in

businesses. He argued that these herd emotional urges lie at the heart of economic booms and busts.

Taking this idea one step further, Robert Shiller, an economist at Yale University, has pushed for a more detailed study of economic narratives—the contagious stories that shape how individuals view the economy and make decisions. Shiller hypothesizes that sufficiently popular narratives can go viral and have society-wide impact (Shiller 2020).

Viral narratives could be the missing link between emotions and economic fluctuations. But policymakers, researchers, and practitioners alike currently lack effective tools to identify these narratives, measure their contagiousness, and quantify their contribution toward economic events.

We made a first attempt to understand the macroeconomic consequences of narratives in a recent paper (Flynn and Sastry 2024). We introduced new tools for measuring and quantifying economic narratives and used these tools to assess their importance for the US business cycle. Our findings suggest that narratives play a central role. They also raise fresh questions about how and why such stories emerge and what policymakers might do differently in such a world.

Natural language processing

To measure narratives, we use resources not available to Keynes: large textual databases of what economic decision-makers are saying and natural-language-processing tools that can translate these words into hard data.

The key datasets we study are the text of US public firms' conference calls, typically held every quarter to review financial results, and Form 10-K filings, regulatory reports filed with the US Securities and Exchange Commission each year. Both are outlets for company management not just to report company results but to offer explanations: They fill in the *how* and *why* of business results and offer clues to how management and investors are thinking about broader trends.

To identify narratives, we apply a variety of natural language techniques. These range from simple dictionary-based methods that scan for keywords and phrases to more complex algorithmic methods that uncover less structured topics. The narratives we uncover pertain to varied topics, such as firms' general optimism about the future, their excitement about artificial intelligence, or their adoption of new digital marketing techniques. Using this database, we can empirically model the extent to which narratives drive firms' decisions and the process by which such stories spread in the US economy.

"A detailed understanding of the origins, spread, and economic consequences of narratives could significantly change how we collect information about the economy and tell the story of the business cycle's ups and downs."

Shaping business decisions

We find that companies with more optimistic narratives tend to accelerate hiring and capital investment. In particular, the pace of hiring at a company that uses optimistic language increases by 2.6 percentage points more in a year than a comparable company that uses pessimistic language. This effect is above and beyond what would be predicted by firms' productivity or recent financial success. These results challenge conventional economic theories, which suggest that these fundamentals, and the "rational" expectations about the future that they embody, should entirely explain firms' economic decisions.

Strikingly, firms with optimistic narratives do not see higher stock returns or profitability in the future and also make overoptimistic forecasts to investors. This suggests that narratives do not simply capture positive news about the future. In this way, firms' optimistic and pessimistic narratives bear the hallmarks of Keynes's animal spirits: forces that drive managers to expand and shrink their businesses but are based on emotions rather than fundamentals.

The data also support the idea that narratives spread contagiously, like a virus. That is, companies tend to adopt the narratives of their peers: When one company adopts an optimistic mood or starts

talking up the transformative power of AI, others seem to follow suit. This narrative contagion seems to start within groups of peer firms that directly compete in the same industry and then spread to the aggregate level. Moreover, there is an especially large effect for narratives that arise at large companies. This raises the possibility that large companies are thought leaders in the narrative economy, with more influence than traditional measures of market power might suggest.

Macroeconomic impact

To interpret these results, we developed a macroeconomic model in which contagious narratives spread between firms. Because narratives are contagious, they draw out economic fluctuations: Even a one-time shock to the economy can have long-lasting effects, because a negative mood infects the population and holds back business activity.

Sufficiently contagious narratives that cross a virality threshold can induce a phenomenon we call *narrative hysteresis*, in which one-time shocks can move the economy into stable self-fulfilling periods of optimism or pessimism. In these scenarios, there is a powerful feedback loop: Economic performance feeds a narrative that reinforces the economic performance. These findings underscore the importance of measurement to pin down exactly how much narratives affect the economy.

How strong are the narratives driving the US economy? Using our model and our empirical measurements, we estimate that narratives explain about 20 percent of fluctuations in the US business cycle since 1995. In particular, we estimate that narratives explain about 32 percent of the early 2000s recession and 18 percent of the Great Recession of 2008–09. This is consistent with the idea that contagious stories of technological optimism fueled the 1990s dot-com bubble and mid-2000s housing bubble. Contagious stories of collapse and despair led to the corresponding crashes.

While the overall mood of the US economy seems to fluctuate slowly around a long-term average, individual narratives—like those surrounding new technologies—tend to be more volatile. These granular narratives are much more likely to go viral and fully infect the population, our research shows. In other words, a constellation of fast-moving fears and fads contributes to the relatively stable behavior of aggregate economic sentiment.

Policy implications

Our analysis suggests that contagious narratives are an important driving force in the business cycle. But it also qualifies this conclusion in important ways. Not all narratives are equal in their potential to shape the economy, and the fate of a given narrative may rest heavily on its (intended or accidental) confluence with other narratives or economic events.

How should policymakers act in a narrative-driven economy? Our analysis has at least three major conclusions, which also suggest future directions for both academic and policy research.

First, what people say is highly informative about both individual attitudes and broader trends in the economy. Public regulatory filings and earnings calls contain lots of valuable information already. Both policymakers and researchers can use improved machine learning algorithms and data processing tools to analyze this information. There are possible implications for how researchers and governments collect information, too. The same data science advances have increased the value of novel surveys that allow households or businesses to explain the "why" behind their attitudes and decisions (Andre and others 2024).

Second, some narratives are more influential and contagious than others. It is therefore important to combine descriptive studies measuring narratives with empirical analysis of their effects on decisions and their spread throughout populations.

Third, the narratives introduced by policymakers have the potential for significant impact. We know relatively little about what makes a policy narrative into a great story: Why, for example, did Mario Draghi's unscripted remarks about doing "whatever it takes" make a much more compelling story than similar statements by other central banks?

The study of narrative economics is still in its infancy. But a detailed understanding of the origins, spread, and economic consequences of narratives could significantly change how we collect information about the economy and tell the story of the business cycle's ups and downs. F&D

DATA

20%

Macroeconomic narratives explain about 20 percent of fluctuations in the US business cycle.

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Reconnecting Morality with Political Economy

Benjamin Enke

PUTTING MORAL INSIGHT BACK INTO ECONOMICS ENHANCES UNDERSTANDING OF POLITICAL OUTCOMES

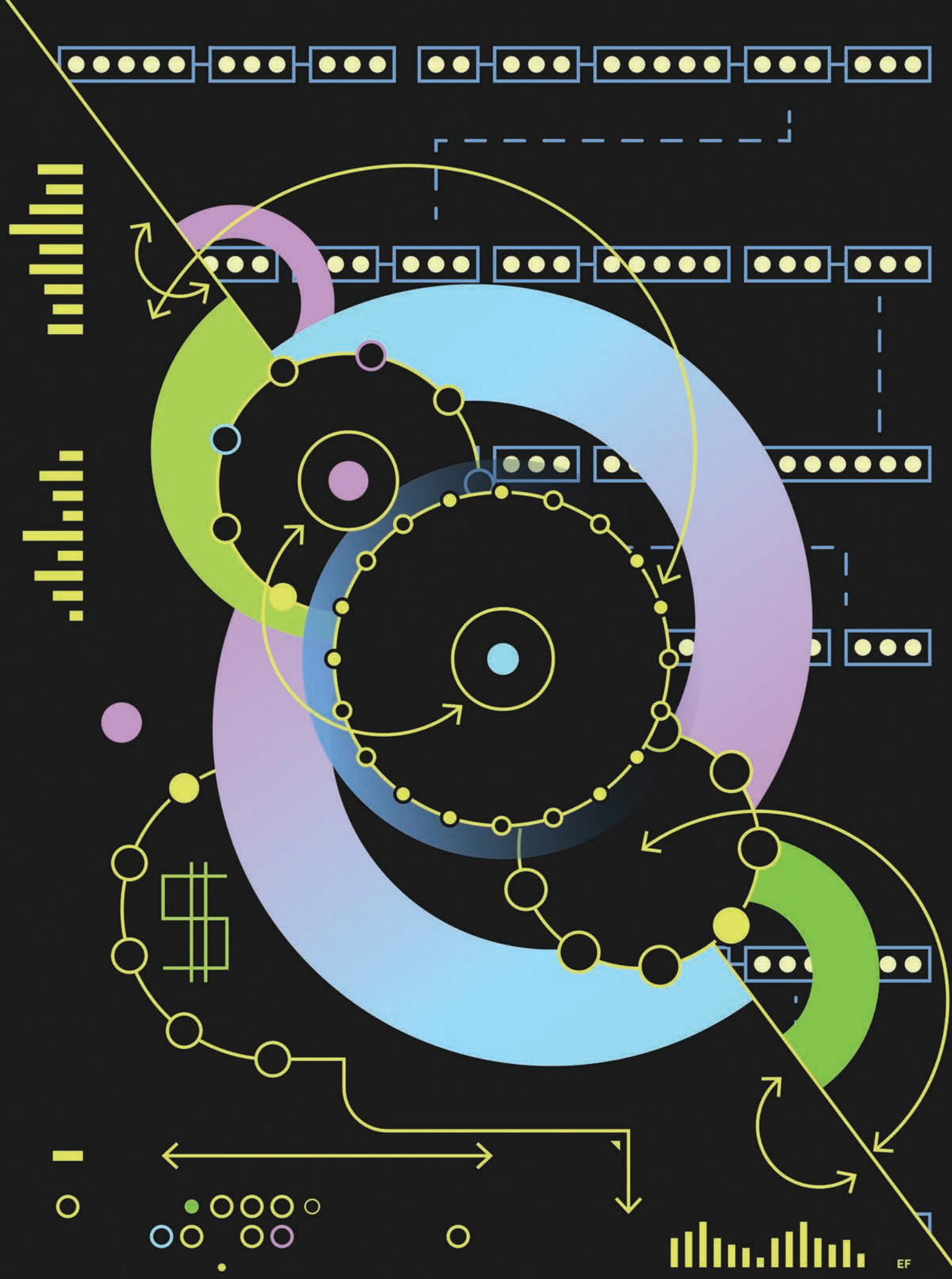
For much of the 20th century, the disciplines of moral psychology and economics were seen as distinct—each focused on separate concerns, with little cross-pollination. This wasn't always the case.

If we look back to philosophers such as Adam Smith and Karl Marx, discussions of political economy were deeply intertwined with questions of morality. More recently, these fields have started to reconnect, recognizing that morality influences economic behavior, and vice versa, in profound ways. It's something I discussed in a recent review of the latest literature in this field (2024).

As an economist, I believe this growing intersection offers valuable lessons not only for academia but also for policymakers grappling with today's biggest challenges, such as greater inequality, political polarization, and diminishing trust in institutions.

One of the most foundational ideas driving the reconnection of moral psychology with economics is the notion, originating from moral psychology, that

Illustration by Eric Frommelt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morality evolved as an economically functional tool, as, for example, Jonathan Haidt, the American psychologist, noted in *The Righteous Mind: Why Good People Are Divided by Politics and Religion*.

In simple terms, morality is thought to be a mechanism through which societies enforce cooperation, enabling large-scale production, exchange, and social cohesion. The idea that morality is socially and economically functional is deeply rooted in an evolutionary perspective: As humans formed increasingly complex societies, cooperation became essential for survival, and moral systems emerged to enforce prosocial behaviors.

Economic imperialism

From an economist's perspective, this framing of morality as a response to economic problems—like ensuring cooperation in transactions—suggests that morality is not fixed but adaptable. As economic environments change, so too do moral values. The rise of globalized markets may, for instance, shift societies from particularist moral frameworks—those that prioritize close-knit, in-group cooperation—to more universalist values that emphasize fairness and equality across broader social networks.

Economists have used these ideas from moral psychology and expanded them. This phenomenon, often referred to as "economic imperialism," occurs when economists apply their tools and methodologies to areas traditionally explored by other social sciences, such as psychology or anthropology. While this approach has occasionally been criticized for encroaching on other disciplines, it can be highly productive when done collaboratively.

Rather than attempting to replace moral psychology, economists have successfully tested and validated its theories—like the functional role of morality—through large-scale empirical work. By doing so, they have contributed valuable insights, especially when empirical testing in broader, real-world settings is required.

To understand how moral systems evolve in response to economic environments, we can look at several key examples. First, historical kinship structures offer a compelling case study. Societies with strong extended family networks often rely on close-knit cooperation within families, which leads to particularist moral values. These societies prioritize loyalty to family and local communities, and their moral systems reflect this emphasis.

Societies with looser kinship networks, however, tend to develop more universalist moral values, with fairness extended to strangers and distant relations alike, as I showed in a 2019 paper. This distinction between universalist and particularist morality, and its link to historical kinship structures, explains much of the cross-cultural variation in moral beliefs, values, and emotions.

Second, exposure to markets also plays a critical role in shaping moral values. In societies where market interactions among strangers are common, universalist values—such as fairness in dealings with people outside one's immediate circle—are likely to thrive. A growing body of research, including my own 2023 paper, shows that societies with greater historical exposure to markets exhibit higher levels of universalism. The more people interact with strangers in markets, the more they develop moral norms that favor impersonal cooperation and trust.

Finally, ecology—the natural environment in which societies are embedded—can also influence morality. Where intensive cooperation with neighbors was necessary for survival, such as in regions with homogeneous and fertile land, particularist values often developed. These values emphasize close community ties, which were essential for agricultural productivity.

Conversely, regions with more variable or fragmented ecological conditions may have fostered universalist values, as cooperation with (and learning from) close neighbors was less important for economic production, as noted by the Israeli economist Itzchak Tzachi Raz.

"The influence of morality on economic behavior goes both ways: Economic conditions shape moral values, but those values, in turn, shape political and economic outcomes."

Political, economic outcomes

The influence of morality on economic behavior goes both ways: Economic conditions shape moral values, but those values, in turn, shape political and economic outcomes. In today's politically polarized climate, moral differences often underpin divisions over economic policy. For example, the distinction between universalist and particularist values helps explain why different groups hold opposing views on issues like taxation, redistribution, immigration, climate change, globalization, and foreign aid.

The main insight is that many traditionally left-wing policies are relatively universalist in nature. Universalist individuals, who prioritize fairness and equality for all, are more likely to support redistributive policies aimed at reducing income inequality, including for people from foreign countries. They are also more supportive of "globalist" policies such as foreign aid, globalization, and climate change prevention. Particularist individuals, who prioritize loyalty to their in-group, often oppose such policies, fearing that redistribution may benefit out-groups or strangers at the expense of their own community, or that immigration may harm their neighbors' prospects of finding a job. This moral cleavage contributes to political polarization and complicates efforts to reach consensus on economic policies.

One of my studies on US voting patterns shows that the moral values of voters closely align with the rhetoric and policies of political candidates. Recent evidence I gathered with Raymond Fisman, Luis Mota Freitas, and Steven Sun strengthens this connection further. We quantify moral universalism using large-scale donations data. According to our approach, US districts are said to be more universalist when a larger share of donations from that district goes to more distant beneficiaries, geographically or socially. Universalists are thus not more or less prosocial—instead, universalist districts give more to faraway places but less to local community causes.

We document that districts with higher universalism tend to vote more for Democratic candidates and elect representatives who use universalist moral language in their speeches. In addition, these districts' representatives exhibit more left-leaning roll-call voting behavior, even within the same party, further demonstrating how these moral values shape both electoral outcomes and legislative actions.

Interdisciplinary approach

Economists have traditionally been cautious about delving into moral questions, preferring to stick to empirical, data-driven analysis. However, I believe that economists stand to gain by engaging more deeply with moral psychology, just as psychologists can benefit from incorporating economic insights into their work. Each discipline brings unique strengths to the table: Economists excel in managing and analyzing large-scale data, while moral psychologists are adept at understanding the intricate processes of individual decision-making and moral reasoning.

This interdisciplinary approach can lead to richer, more nuanced understanding of complex social and political phenomena. Take, for example, the issue of redistribution. Psychological research can shed light on why people hold certain moral beliefs about fairness and equality; economic data can reveal how these beliefs translate into voting patterns and policy preferences. By combining these approaches, we can develop a more comprehensive picture of how moral values influence economic behavior and outcomes.

What does all this mean for policymakers? Above all, it suggests that effective economic policy cannot ignore moral considerations. Policymakers must recognize that people's economic preferences are often shaped by their moral beliefs, which can vary widely across different groups. As a result, policies that align with the moral values of one group may be strongly opposed by another group with different values.

Understanding these moral divisions can help policymakers craft more effective and equitable policies. For instance, redistributive policies that appeal to universalist values might be more successful if they are framed in ways that resonate with particularist individuals as well, such as emphasizing the benefits to local communities.

In addition, recognizing the role of morality in economic behavior can help policymakers anticipate and address political polarization. This could prove vital to bridging the moral divides that push us farther away from consensus. F&D

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JIM GRAHAM

People in Economics

Debunking Myths

Chris Wellisz profiles Princeton's **Leah Platt Boustan**, who uses ancestry data to test commonly held beliefs

LONG BEFORE SHE BECAME AN ECONOMIC HISTORIAN, Leah Platt Boustan's family lore shaped her beliefs about immigration. When she was in high school, she flew from Boston to Chicago with her father to interview her great-uncle Joe about the family's roots. Their interest in genealogy was spurred by the film director Stephen Spielberg's interviews with Holocaust survivors in the mid-1990s.

Leah and her father set up a camcorder on a tripod and listened to her great-uncle describe how his father, who immigrated to the United States from Russia in 1891, got his start selling goods from a pushcart and eventually opened his own store. Uncle Joe, the youngest of eight children, became a lawyer, fulfilling the American dream of upward mobility.

The story reinforced Boustan's initial view that, once upon a time, immigrant families quickly climbed the socioeconomic ladder, but that progress is much slower for today's immigrants. Yet when she and eventual collaborator Ran Abramitzky started analyzing decades of US census data to trace the fortunes of immigrant families across generations, they realized that the children of recent arrivals from Guatemala or Nigeria do just as well as those who came from Italy, Norway, or Russia in the 19th century.

"The biggest surprise for me was when we were looking at the children of immigrants today and the children of immigrants 100 years ago," says Boustan, a professor of economics at Princeton University. "I had a prior belief, which turned out not to be true in the data, that it was harder today for the children of immigrants."

Boustan and research partner Ran Abramitzky developed computer algorithms that linked census data across generations, making it possible to study the fortunes of immigrants' children and grandchildren.

Challenging assumptions

It was just one of the commonly held beliefs that animate the often-angry public debate about immigration policy in the United States. In a dozen papers spanning more than a decade, Boustan and Abramitzky, who teaches economics at Stanford University, challenged several assumptions about immigration in America: that today's immigrants take jobs away from native-born Americans, for example, or that they don't assimilate as quickly as they did in the past.

Those were academic studies aimed at fellow economists. But when the immigration debate reached a fever pitch during and after the 2016 US presidential election campaign, Abramitzky and Boustan decided it was time to address a broader audience.

"Ran and I started talking to each other at that point and said, 'Maybe what we're working on does have something to say about the modern conversation,'" Boustan says. That was the genesis of their 2022 book, *Streets of Gold: America's Untold Story of Immigrant Success*. The book, written in lively, jargon-free prose, was widely reviewed in the academic and popular press.

Boustan's interest in economic history began as an undergraduate at Princeton, where her junior and senior year thesis advisor was Henry Farber, a leading labor economist. Farber introduced her to the National Longitudinal Surveys of Youth, which follow a group of young people as they progress through their working lives. Meanwhile, in an urban history class, she learned about the mass migration of Black Americans from the rural South to northern cities in the 20th century.

Outside of classes, she honed her writing and editing skills at Princeton's alternative undergraduate publication, *Nassau Weekly*, where she became coeditor-in-chief. Her interest in social issues sprang from a year spent after college working at the *American Prospect*, a public policy magazine whose founders included Robert Reich, labor secretary under President Bill Clinton, and Paul Starr, a professor of sociology at Princeton.

Deciding against a career in journalism, Boustan instead took advantage of a National Science Foundation Graduate Research Fellowship to pursue a doctorate in economics. On Farber's advice, she chose to study at Harvard University under Claudia Goldin, who later won the Nobel Prize in economics for her work on the role of women in labor markets.

Black migration, white flight

Boustan's PhD thesis, "Black Migration, White Flight: The Effect of Black Migration on Northern Cities and Labor Markets," was the starting point for much of her later work. In it, she examined the connection between Black migration and the movement of white residents of northern cities to the suburbs that sprang up in the decades following World War II.

Goldin remembers Boustan as a student with well-defined goals who also appreciated the wonders of intellectual exploration. Boustan's key contribution to the field? "It's the sense in her work that migration is an extremely important part of an economy's growth," Goldin says. The vagaries of policy or technology can leave people stranded in places where they may not be the most productive—such as former slaves in the rural South or Europe's poor. "The greatest change is simply moving from one place to another," Goldin says.

In her first published paper, Boustan shifted from migration to immigration. The paper looked at the interplay between religious persecution and opportunities for a better life in the US in prompting the immigration of some 1.5 million Russian Jews in the decades before World War I. That paper was published in 2007, about the time she met Abramitzky.

Abramitzky, an Israeli citizen, had come to the US to pursue a PhD in economics at Northwestern University. One focus of his work was the kibbutz, a community where property is held in common. Abramitzky used fine-grained census data to study why some people chose to leave the kibbutz, giving up their share of the common property to take their chances in the market economy, while others opted to remain.

They were both assistant professors, she at the University of California, Los Angeles, and he at Stanford. She had received the 2006 Economic History Association prize for best dissertation in American history; he had received the prize for best dissertation in non-US history. They met while strolling near a koi pond at the Huntington Botanical Gardens in San Marino, California, during a conference of California-based economic historians and soon became engrossed in conversation.

The talk turned to the potential of big datasets as a tool of analysis on a larger scale than that of the kibbutz. "I said, You know what would be really cool?" Boustan recalls. "What if we could do these kinds of really detailed studies, but for the age of mass migration from Europe to the US?" That idea eventually spawned their first joint article, "Europe's Tired, Poor, Huddled Masses: Self-Selection and Economic Outcomes in the Age of Mass Migration," published in 2012.

Meanwhile, she continued to work on Black migration. Her first book, *Competition in the Promised Land: Black Migrants in Northern Cities and Labor Markets*, was published in 2017. It showed that while Blacks who moved north benefited from higher wages, their northern-born peers faced greater competition for the limited pool of jobs then available to Black workers.

Intellectual partnership

At the same time, her partnership with Abramitzky blossomed. "It's hard to talk about the trajectory of my career without talking about collaboration with Ran," she says. "Everything we've been doing academically, we do together."

"We have huge respect and trust in each other," Abramitzky says. "Some collaborations are just, 'This person can write the model, that person can do the data work.' We are not like that. We are thinking about the world quite similarly."

A priceless source of data for their research on immigration to the US was Ancestry.com, a popular genealogy website. They developed computer algorithms that linked census data across generations, making it possible to study

"The vagaries of policy or technology can leave people stranded in places where they may not be the most productive—such as former slaves in the rural South or Europe's poor."

the fortunes of immigrants' children and grandchildren.

Abramitzky recalls getting a phone call from a lawyer for Ancestry.com who said, jokingly, "You must have a big family over there in Palo Alto." Abramitzky explained that he and Boustan were using the site for academic research, "and since then they became real partners."

They bring the data to life with the stories of immigrant experience gleaned from thousands of interviews compiled by the Ellis Island Oral History Project and conducted their own surveys. "Each immigrant is a story, but we can aggregate this story by looking up many, many, many immigrant families," Abramitzky says.

Boustan even interviewed her father, much as she had interviewed her great-uncle Joe when she was a high school student in suburban Boston. "I almost felt like the torch had been passed," she says. "It seems like it's part of the family legacy to try to preserve these stories from the past."

Upward mobility

That interview confirmed her finding that the first generation of immigrants generally does no better economically than native-born peers, so that the rags-to-riches myth is just that—a myth. Instead, upward mobility is more incremental both today and in the past. It is the second-generation immigrants who close the earnings gap with native-born Americans.

Another myth that Abramitzky and Boustan debunk is that today's immigrants don't integrate as quickly as before. Instead, they find that immigrants today try just as hard to embrace American culture. They learn English just as quickly, are just as likely to leave immigrant residential enclaves, and are even more likely to marry a member of another national or ethnic group.

Perhaps their most counterintuitive conclusion is that immigrant success doesn't come at the expense of native-born Americans. To be sure, some workers who do the same jobs as immigrants face greater competition (often they are themselves recent immigrants). But for the most part, immigrants don't compete for the same jobs and instead concentrate on work that doesn't require English-language proficiency, such as landscaping or construction, while native-born workers fill jobs that require communicating with customers.

"Low-skilled workers may not be substitutes for the high-skilled," Boustan says. "They could be complements. Think about a restaurant. The low-skilled could be the dishwashers; the high-skilled could be the waiters."

Eventually, immigrants may start businesses of their own—a restaurant, say, or a medical practice—creating jobs for others. And immigrants often provide services such as cooking, cleaning, or childcare, which frees up time for native-born Americans and helps them become more productive at their own jobs.

The long view

When it comes to immigration policy, Boustan and Abramitzky say that their research supports taking a long view: If Americans are willing to accept that immigrant success will come over time, there is no need to preselect immigrants based on skills or education, as countries such as Australia and Canada do.

Reihan Salam, president of the right-leaning Manhattan Institute, takes issue with that view. "I think that they wrote a terrific book," says Salam, the author of *Melting Pot or Civil War? A Son of Immigrants Makes the Case Against Open Borders*, published in 2018. "And I think I don't really disagree with that much of it. What I found not necessarily convincing is that there is massive demand for low-skilled migration."

Salam favors a more selective immigration policy, saying it helps make the economy more productive while avoiding some of the short-term social frictions and fiscal costs associated with low-skilled immigrants, who may need subsidized housing or health care.

Over the years, Abramitzky and Boustan have moved on with their careers and family lives. He is now senior associate dean of the social sciences at Stanford. His wife, Noya, is an educator who ran the local Hebrew school. Boustan is director of the Industrial Relations Section at Princeton. She is married to Ra'anan Boustan, a research scholar in the Program in Judaic Studies at Princeton. Both couples have three children. As they grew busier with administrative and family duties, they brought in more graduate students to help with research.

Their next project? Immigration to Europe, which has spurred a rightward shift in politics there. It's a vast undertaking. "We have 37 coauthors," Boustan laughs. "I feel like I'm becoming like a company manager or something." F&D

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

Book Reviews

Deutschland's Denouement

Christoph Rosenberg

"Germany has made many economic missteps and wrong turns over the past 30 years."

GERMANY IS IN A FUNK. Stagnating growth and high living costs have led to much hand-wringing about what went wrong and how to move forward, including during the recent election campaign. For the first time, the navel-gazing extends to questions about the viability of Germany's postwar economic model itself.

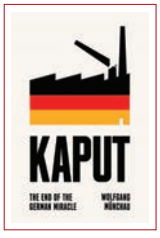
Wolfgang Münchau's *Kaput: The End of the German Miracle* could therefore not be timelier. A veteran commentator on European economics at the *Financial Times*, he offers a scathing account of his native country's many missteps and wrong turns over the past 30 years.

Germany's structural economic weaknesses are well known: the fixation on manufacturing (especially of fossil-fuel-powered cars), the dependence on energy imports from Russia and on exports to China (replaced recently by the United States), the scarcity of skilled labor, the excessive bureaucracy, the slow pace of digitalization, the parochial financial system, and the gross neglect of infrastructure investment because of rigid fiscal rules.

What makes Münchau's book stand out is its astute analysis—richly supported by anecdotes—of the interplay between politicians, corporate CEOs, labor leaders, bankers, and the media. Collectively, they produced a national obsession with a neo-mercantilist economic model that centered on exporting high-quality goods—motor vehicles, chemicals, and all kinds of mechanical hardware.

Münchau's perspective is microeconomic. But by developing his narrative around individual actors, trade competitiveness, and the fate of certain industries, he misses an important macroeconomic story: Germany's historically high national saving rate and related capital account surpluses. Households that save rather than consume incentivize companies to export rather than sell domestically. The government obsesses over keeping budget deficits low rather than making necessary investment. Banks channel all those household savings into risky foreign investments, as happened in the run-up to the euro crisis in the 2010s. The country's deep-seated aversion to incurring debt is the flip side of its obsession with exports.

It is a symptom of a broader mindset to which Münchau only alludes: the desire not to put at risk what has been attained—*Besitzstandswahrung*, as they say in German. The lack of a start-up culture, the foot-dragging on new technologies such as fiber-optic networks or electric vehicles, extreme fiscal conservatism—all well documented in the book—can be traced to this particular post–World War II mindset. Elaborating on it would have made the analysis even richer.



KAPUT
The End of the German Miracle

Wolfgang Münchau

Swift Press

London, 2024, 211 pp., $33

Having established how Germany went off course, Münchau shies away from proposing how to right the ship. His only concrete proposal, added as an afterthought in the epilogue and dismissed immediately as unrealistic, is to advance the European capital market union. Meanwhile, his analysis would offer ample opportunities to spell out a realistic reform agenda—for example, modifying the suffocating fiscal debt brake to increase public investment, supporting start-ups, or finally advancing digitalization in earnest.

The book therefore ends on a downbeat, almost defeatist note. Yet there are glimmers of hope, starting with the debate about whether neo-mercantilism can work in a postglobalization era—to which Münchau himself contributes so well. There are nonmanufacturing German companies, even large ones like software developer SAP, that continue to do well. And if conditions are right, some of those expat German entrepreneurs and researchers may decide to return. All may not be lost for Germany, as Münchau suggests. **F&D**

CHRISTOPH ROSENBERG *is a former deputy director of the IMF's Communications Department.*

Global Trade and Geopolitics

"Mavroidis's pragmatism is a refreshing but sobering reflection on where we are today."

Elizabeth Van Heuvelen

INDUSTRIAL POLICY IN THE NAME OF national security is surging, and it's stretching the world trading system to the breaking point, according to Petros Mavroidis, a professor at Columbia Law School. His latest book, *Industrial Policy, National Security, and the Perilous Plight of the WTO*, should be required reading for trade experts and others trying to make sense of trade policy today. It tells the history of the current system, offers deep knowledge of World Trade Organization (WTO) legal structures and case law, and presents a sweeping account of how global trade and geopolitics interact.

Mavroidis, who worked in the WTO legal affairs division from 1992 to 1995 and has been a legal advisor to the organization since 1996, uses the example of semiconductors to illustrate the rise of global value chains and the growing entanglement of industrial and national security policies. The semiconductor industry, with its dual-use military and civilian technologies, has benefited from substantial government intervention. It's where geopolitics and global value chains collide.

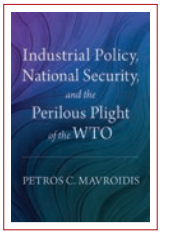
The book reminds us that many contemporary challenges are explained through the history of the 1947 General Agreement on Tariffs and Trade (GATT), which preceded the launch of the WTO in 1995. Weak subsidy rules and the international system's inability to impose discipline are arguably at the core of some of the most contentious trade disputes today. The origins can be traced to the US view of the world at the time the agreement was drafted, Mavroidis argues.

US President Franklin Roosevelt, emboldened by New Deal policies and their accompanying subsidies, turned his attention to building a liberal international order that aimed to avoid "dissonance between domestic planning and international obligations." Like the United States, the 22 other founding members of the tariffs and trade agreement were reluctant to limit their use of subsidies. They were market economies, but they relied on considerable state intervention to rebuild their societies after World War II.

The GATT's framers failed to plan for a world that frequently invokes the national security exception. After all, the agreement was a "relational contract among like-minded players," Mavroidis explains, and use of the provision was sparing. Since its beginning, of course, the agreement has evolved into the 166-member WTO, which represents over 98 percent of international trade and a spectrum of geopolitical and strategic interests. In recent years, use of this provision has become more common, and its use and abuse have led to "cosmic uncertainty" about the strength of the system.

The author argues, moreover, that the WTO was predicated on the misguided belief that we had already reached "the end of history," that liberal democracy was inevitable, and that "China was on an irrevocable path toward becoming a market economy." This had far-reaching implications for China's WTO accession and amounted to missed opportunities to impose more controls on subsidies and state-owned enterprises.

The challenges confronting the multilateral trading system are immense, and Mavroidis does not purport to solve all problems. Instead he argues that the WTO is worth saving and proposes reforms to improve cooperation at least to "guarantee that there is a boat to navigate" when the environment is more conducive to change. This pragmatism is refreshing, but it is also a sobering reflection on where we are today. **F&D**



INDUSTRIAL POLICY, NATIONAL SECURITY, AND THE PERILOUS PLIGHT OF THE WTO

Petros C. Mavroidis

Oxford University Press

New York, NY, 2025, 355 pp., $160

ELIZABETH VAN HEUVELEN *is a senior economist in the IMF's Strategy, Policy, and Review Department.*

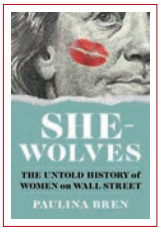
Women on Wall Street

Lisa Kolovich

WRITER AND HISTORIAN PAULINA BREN tells the stories of the first women to work in New York's banks and brokerages in *She-Wolves: The Untold History of Women on Wall Street*. She shows that women faced a hostile environment, rife with daily harassment, gender and racial discrimination, and invisible barriers. Readers are left with a vivid picture of the breadth and depth of entrenched social norms and systemic inequities from the 1960s onward. Yet Bren's compelling storytelling also captures the perseverance, resilience, and ingenuity of Wall Street's early female pioneers and their profound impact in reshaping the world of finance.

Bren introduces readers to Muriel Siebert, who became the first woman to hold a seat on the New York Stock Exchange, in 1967, and successfully navigated an environment where the attitude was, "It's not that women are prohibited. It's just that they're not allowed." Bren also introduces a cohort of women who began their Wall Street careers as secretaries and parlayed their roles into positions of influence through determination and resourcefulness. *She-Wolves* spotlights Harvard Business School alumnae who, despite having equal credentials as their male counterparts, were told that they would never be hired on Wall Street. Over and over, the stories show how Wall Street underestimated and undervalued women while simultaneously benefiting from their insightful and innovative work.

A hallmark of the book is how Bren, a professor at Vassar College, in Poughkeepsie, New York, skillfully connects powerful individual stories to broader social and cultural trends, charting the progress of women's representation and agency in finance. She traces pivotal moments—the rise of the women's movement, the sway of the National Organization for Women, the establishment of the Equal Employment Opportunity Commission, even the placement of the "Fearless Girl" statue on Wall Street—to acquaint readers with the realities of the broader environment. Bren's focus on her subjects' personal and professional histories adds depth and humanity to their struggles and triumphs.



SHE-WOLVES
The Untold History of Women on Wall Street

Paulina Bren

W. W. Norton & Company

New York, NY, 2024, 384 pp., $29.99

"Bren skillfully connects powerful personal stories to social and cultural trends."

Beyond chronicling historical challenges, *She-Wolves* underscores how the systemic issues faced by Wall Street's early women—unequal pay, glass ceilings, and workplace harassment—continue to hinder women's progress today, albeit in more subtle forms. Seemingly positive signs of progress, such as the increasing number of women occupying top executive roles and the rise of female-led investment firms, are balanced with sobering realism. Marianne Spraggins, Wall Street's first Black female managing director, was routinely "mocked for her race and her aggressiveness." Bren's analysis serves as both a celebration of how far women have come and a reminder of how far society will have to go to achieve equality.

She-Wolves is an inspiring and necessary contribution to the history of women in finance. The blend of historical insight and relatable storytelling makes the book accessible and impactful. It shines a light on the indelible contributions of women who dared to lead in places where they were often unwelcome and inspires us to envision a future where such courage is no longer necessary. **F&D**

LISA KOLOVICH *is a senior economist in the IMF's Strategy, Policy, and Review Department.*

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Valued Visionary

Natalia Venegas Figueroa

Peru's new 200-sol banknote features pioneering painter Tilsa Tsuchiya

Tsuchiya was born to a Japanese immigrant father and Peruvian-Chinese mother.

PERUVIAN ARTIST TILSA TSUCHIYA rose to prominence in the mid-20th century for depicting Andean myths in a surrealist style. Now this pioneering painter and engraver is once again drawing attention to Peru's cultural diversity and women's contributions to national identity—this time from the front of the new 200-sol banknote.

"Her presence on this banknote honors her legacy and the values she embodies for our nation," Abraham de la Melena, an official at the Central Reserve Bank of Peru, told the *Gestión* newspaper, citing her representation of resilience, creativity, and cultural richness.

The 102-year-old central bank worked with British design company De La Rue to produce a visually compelling note. The front features a portrait of Tsuchiya, surrounded by the fantastical creatures and cosmological motifs that inspired her art. The reverse depicts Peru's diverse flora and fauna, including an Andean cock-of-the-rock, the brightly plumed national bird.

The industry group High Security Printing Latin America in June honored the 200-sol note, the currency's highest denomination, along with smaller bills, as the best new series of 2024. The 200 note also meets high security standards, with a unique machine-readable component, according to Crane Currency, a printer for central banks that worked on the security measures. Embedded in a vertical stripe of a micro-optic security thread, for example, is an Andean cross of Incan and pre-Incan societies, known as a "chakana," which expands and contracts when the note is tilted.

Other figures celebrated as part of the series include Afro-Peruvian singer Chabuca Granda, novelist José María Arguedas, Inca historian María Rostworowski, and diplomat and engineer Pedro Paulet.

Tsuchiya is regarded as one of Peru's greatest artists. She was born in 1928 to a Japanese immigrant father and Peruvian-Chinese mother in the coastal district of Supe, north of Lima. As a student in Paris in the 1960s, she was influenced by André Breton's surrealist movement. Tsuchiya's art reflects her dual heritage and often incorporates pre-Columbian symbols to address themes of identity, femininity, and mythology in a distinctive style.

As well as recognizing a great Peruvian artist, the 200-sol banknote is a reminder of the nation's rich heritage. It connects people with a legacy of creativity, resilience, and cultural pride. **F&D**

NATALIA VENEGAS FIGUEROA *is on the staff of* Finance & Development.

COURTESY DE LA RUE

Tsuchiya's oil-on-canvas *Bodegón* still life is dated 1971.

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