McKinsey Global Institute

Investing in productivity growth

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At a glance

— **The past quarter century has been a success story for global productivity.** Median economy productivity has jumped sixfold. Thirty emerging economies, with 3.6 billion people, are in the "fast lane" of improvement; if they maintained this pace, they would converge to advanced-economy productivity levels within roughly the next quarter century.

— **Yet amid this global revolution, many economies have experienced productivity stagnation.** Advanced-economy productivity growth has slowed by about one percentage point since the global financial crisis (GFC). At their current pace of improvement, "slow-lane" emerging economies, home to 1.4 billion people, would never catch up to advanced-economy levels.

— **Today the world needs productivity growth more than ever.** It is the only way to raise living standards amid aging, the energy transition, supply chain reconfiguration, and inflated global balance sheets.

— **By investing to regain pre-GFC productivity growth, advanced economies stand to gain between $1,500 and $8,000 in incremental GDP per capita by 2030.** These economies experienced their slowdowns as two waves of productivity growth in manufacturing (powered by Moore's law and offshoring) came to an end. Post-GFC investment declined sharply and persistently, failing to generate anything to take their place. But today, directed investment in areas such as digitization, automation, and artificial intelligence could fuel new waves of productivity growth.

— **Investment is also the primary driver for emerging economies to reach or remain in the "fast lane."** Current fast-lane economies (China, India, parts of Central and Eastern Europe, and Emerging Asia) have sustained high investment, at 20 to 40 percent of GDP. They have channeled it into building the cities and infrastructure that underpin successful urbanization, higher productivity in service sectors, and globally connected manufacturing. Economies in the middle and slow lanes might follow suit.

— **There is reason for hope and motivation for action.** Higher inflation and interest rates may signal stronger demand and encourage productive capital allocation—while discouraging the increasing debt and inflating asset prices of the past two decades. AI has potential to change work rapidly and broadly, creating fertile conditions for such investment.

The world needs to—and can—accelerate productivity growth

The world's living standards have climbed sharply over the past 25 years, driven by strong productivity growth.[1] Median economy productivity surged sixfold over this period.[2]

Yet productivity growth is fading, and in many parts of the world, it has failed to start at all. Since the global financial crisis (GFC) around 2008, there has been a near-universal slowdown. In advanced economies, productivity growth had already decelerated before the GFC—from an average of 2.2 percent per year in the five years to 2002 to 1.6 percent through 2007—and then fell further, to less than 1 percent, in the 2012–22 decade.[3] In emerging economies, productivity growth accelerated before the GFC, from 2.0 percent in the five years to 2002 to 5.9 percent through 2007, and then fell to 3.4 percent in the decade to 2022.[4]

Productivity growth means getting more from our work and from our investments (see sidebar "Measuring productivity"). It is especially needed now as the world faces the many challenges of a new geo-economic era. Productivity growth is the best antidote to the asset price inflation of the past two decades, which has created about $160 trillion in "paper wealth" and even larger amounts of new debt. Absent a surge in productivity, we could be headed for a Japan-style wealth reset or a period of sustained inflation.[5] Second, we need to fund the net-zero transition and keep improving living standards if we are to achieve sustainable inclusive growth. Closing the empowerment gap and the net-zero investment gap requires the equivalent of 8 percent of global GDP annually, which will be very hard to achieve without rapid productivity growth.[6] Other looming challenges include aging populations in most advanced economies, China, and elsewhere, along with global trade tensions and supply chain disruptions.

This report provides an overview for private and public decision makers on the most important features of productivity growth, why it slowed, and what reaccelerating it would take.[7] It offers a fresh look at the slowdown in advanced economies and quantifies the few drivers that matter most. It analyzes emerging economies that are traveling in different "lanes" at varying speeds and distills what lagging economies would need to do to shift into the fast lane of growth.

It argues for one common imperative across all economies: investment in tangible and intangible capital.

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1 *Pixels of Progress: A granular look at human development around the world*, McKinsey Global Institute, December 2022; and Max Roser, *The short history of global living conditions and why it matters that we know it*, Our World in Data, 2016.

2 Based on Conference Board data (from the Total Economy Database) for 125 emerging and advanced economies. The sixfold increase is the jump in the weighted median productivity level of these economies between 1997 and 2022. Note that several numbers in this report may not perfectly match similar numbers from other MGI reports. The differences normally come from different definitions or methodologies, depending on the data source. For example, in the February 2023 MGI report *Rekindling US productivity for a new era*, the most common measure is nonfarm, private business labor productivity, while in this report we use total economy productivity. Additionally, that report uses data from the US Bureau of Labor Statistics, while here we use The Conference Board and other sources that allow us to make comparisons across economies. Like the United States, other economies have local sources whose statistics may differ slightly from the numbers we present.

3 We split the quarter century into five-year periods: 1997–2002, 2002–07, 2012–16, and 2016–22. We skip the volatile five years of the GFC (2007–12) because they are highly distortive. For instance, in the United States, growth in capital per hour jumped significantly during the crisis simply because hours worked tanked.

4 China and India are among the economies whose productivity growth slowed, but their increasing importance masks a starker decline. Excluding them, productivity growth in emerging economies fell from 3.5 percent in 2002–07 to 1.3 percent in 2012–22.

5 *The future of wealth and growth hangs in the balance*, McKinsey Global Institute, May 2023.

6 *From poverty to empowerment: Raising the bar for sustainable and inclusive growth*, McKinsey Global Institute, September 2023.

7 We benefit from our own and other literature on productivity, which is vast. See the MGI reports *Outperformers: High-growth emerging economies and the companies that propel them*, September 2018, and *Rekindling US productivity for a new era*, February 2023, and, for example, *Global productivity: Trends, drivers, and policies*, World Bank, 2021; World Bank and Bart van Ark, Klaas de Vries, and Dirk Pilat, *Are pro-productivity policies fit for purpose? Productivity drivers and policies in G-20 economies*, The Productivity Institute, September 2023.

Measuring productivity

Productivity is a measure of output relative to input. For this report, we focus on labor productivity, which is defined as economic output (gross domestic product, or GDP) per hour worked.[1] This is a commonly used productivity measure and the most consequential determinant of long-run economic and real wage growth. Rising prosperity—a higher standard of living—can come only from productivity growth in the long run. And over time, labor productivity and real wages are closely, though not perfectly, linked.[2]

Two input factors drive labor productivity. The first is the amount of capital per worker, the increase of which is also called capital deepening. Capital can be tangible, like machines or infrastructure, or intangible, like software or R&D investment. Office workers are more productive with a laptop than without one, construction workers more productive with a crane, and transportation service workers more productive with good infrastructure in place, all else being equal. The second factor is human capital: the education, abilities, and accumulated experience of working people.

Finally, productivity can rise from using physical and human capital more efficiently. This total factor productivity (TFP) is commonly measured as a residual after accounting for capital deepening and human capital growth.

[1] We focus on national- or sector-level productivity from a growth economics perspective. Organizational or individual worker-level productivity research often studies other issues related to attrition, disengagement, skills mismatch, or time inefficiency. See, for example, Aaron De Smet, Marino Mugayar-Baldocchi, Angelika Reich, and Bill Schaninger, "Some employees are destroying value. Others are building it. Do you know the difference?," *McKinsey Quarterly*, September 2023. We take GDP as reported by internationally recognized institutions and research organizations. We are aware that GDP is an imperfect metric; see, for example, "A study of lights at night suggests dictators lie about economic growth," *Economist*, September 29, 2022. But using official statistics is the most reliable and consistent way, at least for now, to establish economy comparisons. We divide GDP by hours worked whenever possible, and by number of employees when hours worked data is not available. GDP per hour worked is more precise. Variation in hours per employee by economy stems from labor market regulation differences, differences in preference for part-time employment, and other factors.

[2] Anna M. Stansbury and Lawrence H. Summers, *Productivity and pay: Is the link broken?*, National Bureau of Economic Research, working paper number 24165, December 2017; and Grant E. Hayes et al., *Productivity and wages: What was the productivity-wage link in the digital revolution of the past, and what might occur in the AI revolution of the future?*, National Bureau of Economic Research, working paper number 30734, December 2022.

This report consists of four sections. Section 1 reviews worldwide productivity performance over the past 25 years and identifies which emerging economies are in the fast, middle, and slow lanes on the highway of convergence with advanced-economy standards of living.[8] Section 2 offers in-depth analysis of the recent productivity growth slowdown in advanced economies. Section 3 delves into emerging economies and what it takes to be in the fast lane. Finally, section 4 discusses productivity growth in this new geo-economic era, laying out the main challenges and opportunities for businesses and policy makers.

[8] Throughout this report, we use the word "convergence." We define it as the process of emerging economies catching up with advanced economies by growing their productivity at a faster speed. An emerging economy that has higher productivity growth than advanced economies is converging, while one that has equal or lower productivity growth is not converging or is diverging.

1. The rise and fall of global productivity growth in the 21st century

Over the past 25 years, the world experienced strong productivity growth, driven in large part by China and India. This trend enabled many emerging regions and economies to narrow the gap—or "converge"—with the living standards of more advanced economies. However, the global financial crisis (GFC) worsened an existing slowdown in productivity growth in advanced economies and applied the brakes to a pre-crisis surge in emerging economies.

The world has had strong productivity growth over the past 25 years, driven by standout regions

From 1997 to 2022, median economy productivity jumped roughly sixfold, going from approximately $7,000 to $41,000 per employee, which is equivalent to an annual growth rate of 7.3 percent.[9] The average global productivity growth rate was 2.3 percent annually during this period. (For an even longer-term perspective, see sidebar "The very long run: 100 years of convergence and divergence.")

Gains were most prominent in the middle and at the bottom of the global productivity distribution, as several major population centers experienced a surge of catch-up growth (Exhibit 1). The bottom 10 percent of economies made large gains, quadrupling their productivity, while progress was slower for the top 10 percent, which edged forward by 20 percent over this period.[10]

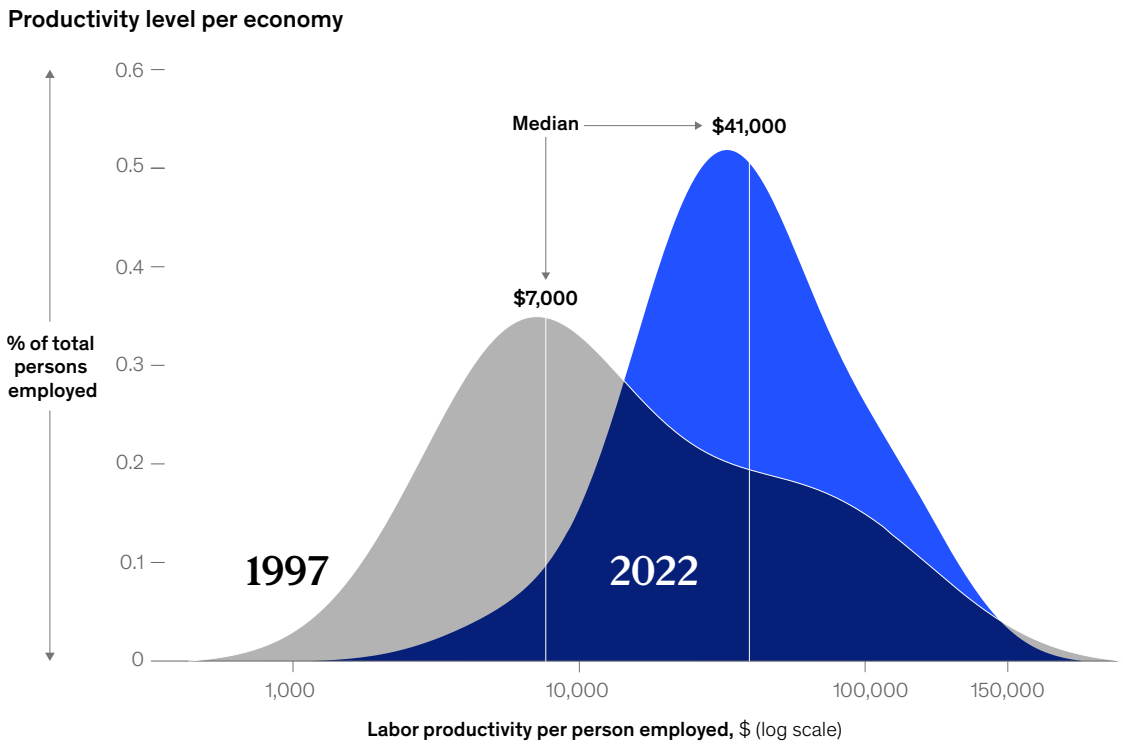
The average global productivity growth rate was 2.3 percent annually from 1997 to 2022.

[9] Calculated as the median of the productivity level of all economies in each respective year. A sixfold increase is equivalent to an annual growth rate greater than 7 percent. Note the difference from the average, which grew at an annual rate of 2.3 percent per hour (or 2.1 percent per employee). These are all population-weighted figures, so China and India have a significant weight, particularly on the median.

[10] Our findings are in line with those of Patel, Sandefur, and Subramanian, who find global unconditional convergence of GDP per capita starting in the mid-1990s. See Dev Patel, Arvind Subramanian, and Justin Sandefur, "The new era of unconditional convergence," *Journal of Development Economics*, Volume 152, September 2021.

Exhibit 1

Median economy productivity jumped sixfold, while the top was more static.



Note: GDP per employee in 2022 international dollars, PPP. N=125 (excludes DR Congo, Iraq, Syria, Taiwan, Venezuela, and Yemen).
Source: The Conference Board's Total Economy Database, "Output, Labor, and Labor Productivity"; McKinsey Global Institute analysis

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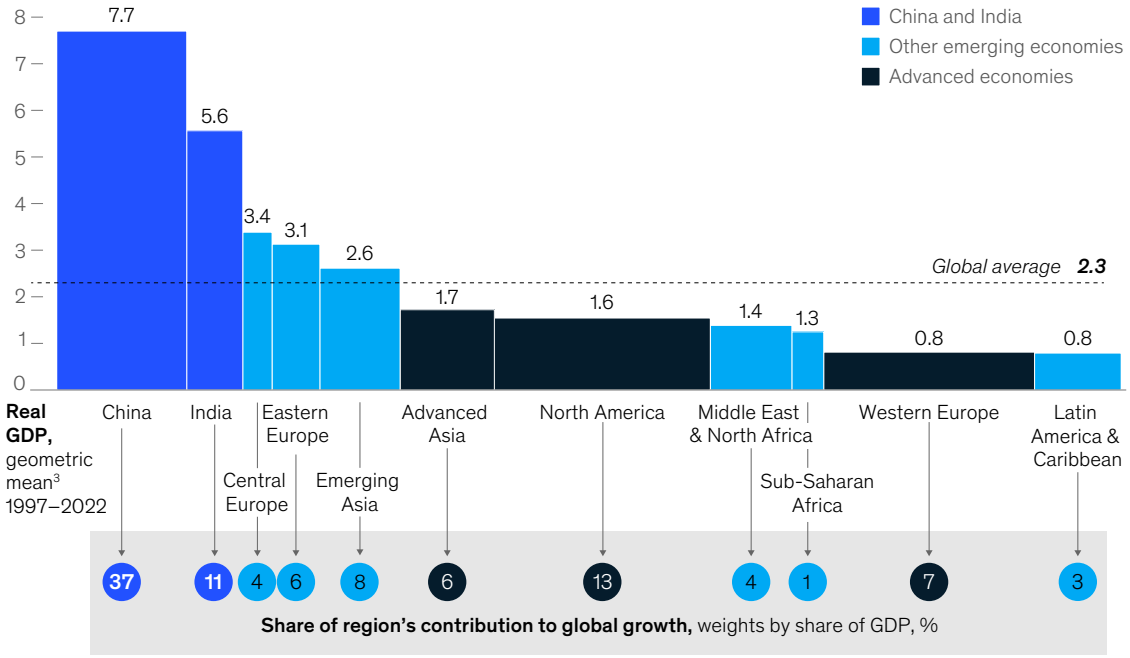
China and India accounted for nearly half of aggregate global productivity growth (Exhibit 2). Other regions—Central Europe, Eastern Europe, and Emerging Asia—also made rapid progress, narrowing their gap with advanced economies. Yet growth rates in the Middle East and North Africa, Sub-Saharan Africa, and Latin America and the Caribbean were similar to or lower than those in advanced economies, which means that they did not converge at all or even fell behind.

Exhibit 2

About 50 percent of global productivity growth came from China and India, and 75 percent from all emerging economies combined.



[1]Area is proportional to region's contribution to global productivity growth, weighted by GDP share.
[2]GDP/hour worked. For 59 economies mainly located in the Middle East/North Africa and in Sub-Saharan Africa, it is calculated between 1995 and 2004, applying backward the CAGR 2005–19 of average annual hours worked.
[3]X-axis width represents each region's share of global real GDP, 1997–2022. We use the geometric mean of real GDP (1997–2022) to account for the compounding effect of growth over time. This allows a more accurate representation of the average growth rate of an economy over the observed period.
Note: N=125, excluding Taiwan, DR Congo, Iraq, Venezuela, Syria, and Yemen.
Source: The Conference Board's Total Economy Database, "Output, Labor, and Labor Productivity"; McKinsey Global Institute analysis

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Emerging economies are on a three-lane highway to catch up with advanced economies

Ideally, all economies would have high productivity growth and raise their living standards. Additionally, economies with lower productivity levels would catch up—that is, converge—with higher-productivity economies as they replicate the best ideas in humanity and generate higher initial returns on fresh capital.

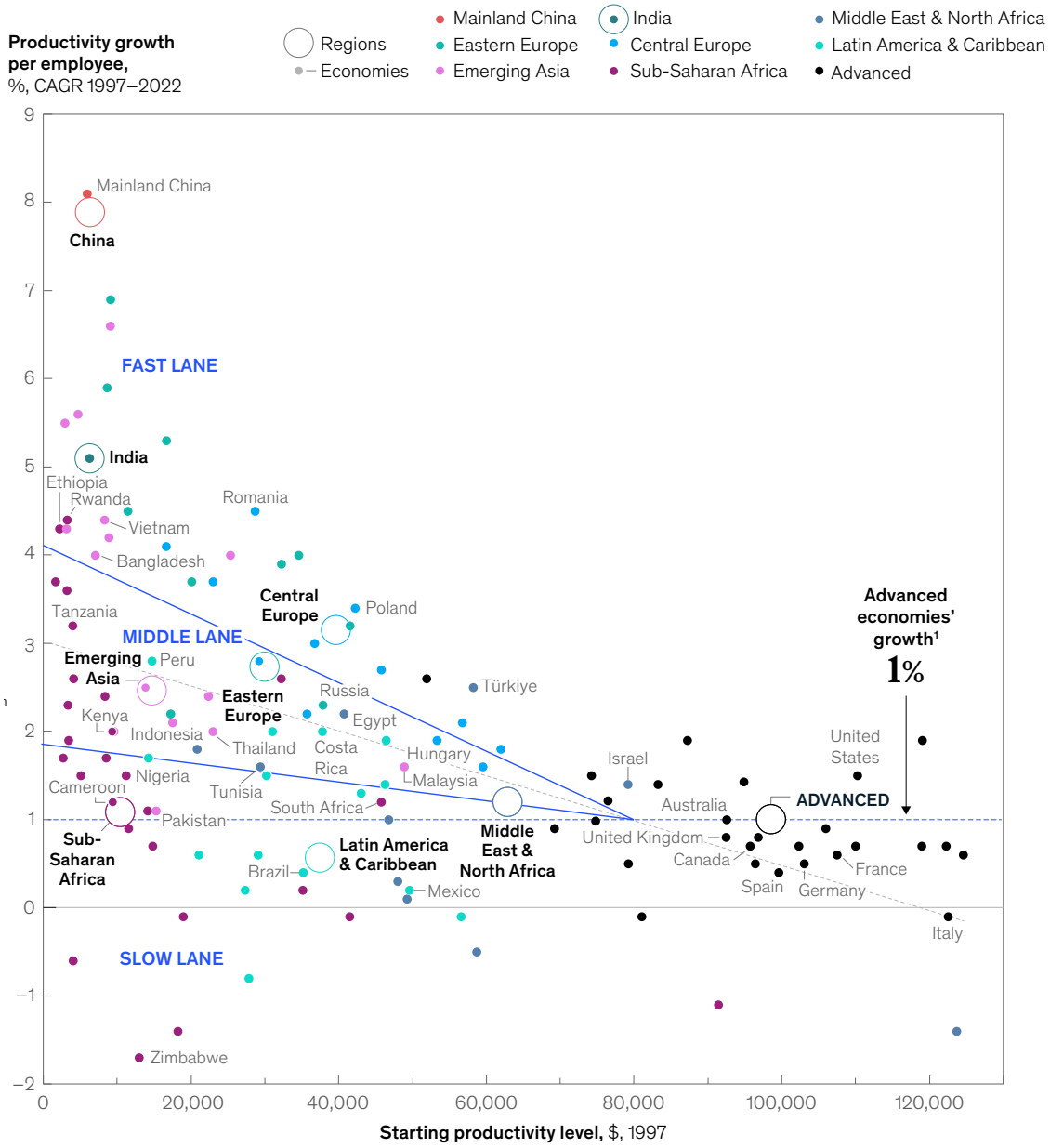
Yet the pace at which emerging economies have been raising productivity varies widely (Exhibit 3). If they kept the average pace of productivity growth of the past quarter century, Poland would fully close the gap with the average advanced economy in 11 years and China would get there in 16 years. But Indonesia would take 135 years, and Argentina would never get there.[11]

We classify economies into the fast, middle, and slow lanes of convergence. These lanes are defined by both the economies' starting points (their productivity level in 1997 on the x-axis), and

[11] This calculation assumes that every economy keeps growing at past rates permanently. This is an illustrative exercise; naturally, we expect economies to slow down as they get richer. For a discussion of China's catch-up trajectory with the United States that models falling growth rates over time, see Jesús Fernández-Villaverde, Lee E. Ohanian, and Wen Yao, *The neoclassical growth of China*, National Bureau of Economic Research, working paper number 31351, June 2023.

Exhibit 3

Emerging economies occupy the fast, middle, or slow lane to convergence with advanced economies.



Population, 2021, million

[1]Includes economies from North America, Western Europe, and Advanced Asia.
Note: N=118, excluding DR Congo, Iraq, Luxembourg, Syria, Taiwan, Venezuela, Yemen, and oil-rich economies (where oil >25% of GDP): Bahrain, Kuwait, Libya, Qatar, Saudi Arabia, and United Arab Emirates. China region includes China and Hong Kong.
Source: The Conference Board's Total Economy Database, "Output, Labor, and Labor Productivity"; McKinsey Global Institute analysis

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their speed (their rate of productivity growth on the y-axis).[12] In short, an economy in the fast lane has experienced high productivity growth relative to its starting productivity level. Our data set includes 27 advanced economies and 91 emerging economies.

— *Advanced economies are at the forefront.* These 27 economies in Western Europe, North America, and Advanced Asia represent about one billion people. As a group, they have averaged 1.0 percent productivity growth over the past 25 years. This is a relatively slow-moving target for economies striving to catch up, but advanced economies are still moving forward and capturing the power of compounding improvements.

— *China, India, most of Central and Eastern Europe, and some other individual economies are in the fast lane.* Thirty emerging economies, representing 3.6 billion people, are in the top third of performance. On average, their productivity growth was about 6 percent per year. This enabled more than one billion people to escape poverty over the past 25 years in China and India alone.[13] At their 6 percent rate, an average fast-lane economy with a productivity level of $34,000 would take 28 years to match the advanced-economy average.[14] In Europe, fast-lane economies include Romania, Poland, Estonia, Lithuania, and Latvia. Beyond China

[12] We run a linear regression where starting productivity level is the independent variable and productivity growth the dependent variable. Outperformers are above the line, underperformers below it. Crossing this regression line with the advanced economies' growth rate, we set a focal point and shift the slope of the regression line to divide emerging economies into equal thirds: top third (fast lane), middle third (middle lane), and bottom third (slow lane).
[13] Defined as poverty head-count ratio at $3.65 a day (2017, purchasing-power parity). Poverty and inequality platform, World Bank.
[14] We take the 2022 productivity level of any emerging economy or group of emerging economies and the advanced-economy average, and apply forward their respective annual productivity growth rates between 1997 and 2022. The time to converge represents how long it would take for these two productivity levels to coincide at these growth rates.

The very long run: 100 years of convergence and divergence

For as long as they have been measured, waves of productivity growth have flowed across regions, industries, and eras, generated by new technologies and by the ways cities and infrastructure were adapted to them (Exhibit).

Those technologies may be wholly new to the world, driving growth in the living standards of frontier or advanced economies. Or they may be newly adopted by emerging economies, delivering what is often termed "catch-up" growth, which allows their living standards to converge with those of more advanced economies.

At the beginning of the 20th century, in the lead-up to and through World War I, innovations made the United States the frontier economy, taking the mantle of innovation and productivity leadership from Europe (and the United Kingdom in particular). Driven by the Second Industrial Revolution, which brought electrification, mass production, and automation, US productivity growth averaged almost 3 percent from 1910 through the 1970s, despite the Great Depression and slumps at the end of each world war. This performance was driven by increased productivity in manufacturing and the mechanization of agriculture, as well as deep changes in sector composition as agriculture fell from 41 percent of the total US workforce in 1900 to just 4 percent in 1970.[1]

After World War II, Europe and Japan enjoyed strong productivity booms. Populations moved to urban centers as investment rebuilt the cities to accommodate the new residents. Investment in technology supported catch-up with the United States. Only the 1970s energy crises and stagflation brought the boom to an end.

China then accelerated its productivity growth after opening its economy in 1978. Its convergence with advanced economies started thanks to pro-market reforms and sustained high investment. China joined the World Trade Organization in 2001 and became deeply integrated into global supply chains before its productivity growth peaked in the late 2000s. Other major Asian economies, such as India, also made progress as they integrated into global value chains over the past quarter century. The remaining emerging economies, on average, also had a boost in productivity growth in the early 2000s, but overall, their growth was weak (along the lines of advanced economies' growth).

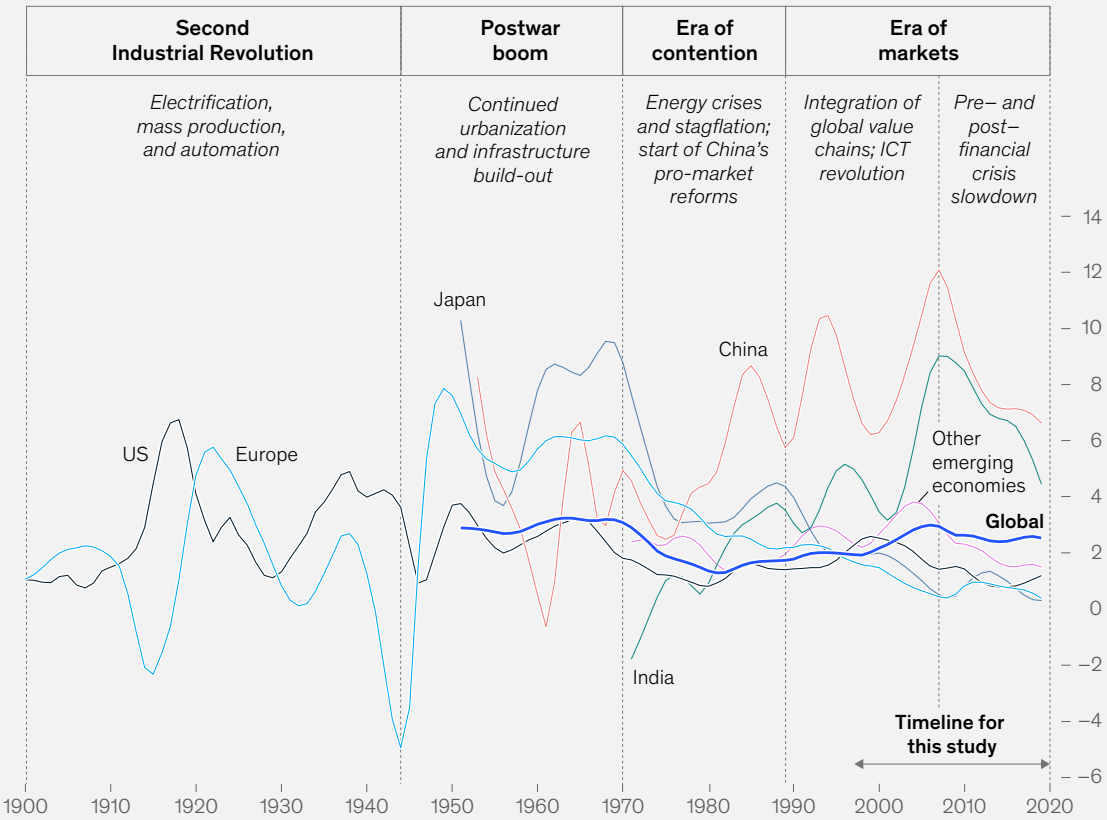
[1] Carolyn Dimitri, Anne Effland, and Neilson Conklin, *The 20th century transformation of U.S. agriculture and farm policy*, Economic Information Bulletin number 3, United States Department of Agriculture, June 2005.

The very long run: 100 years of convergence and divergence (continued)

Exhibit

Long-run productivity growth ebbs and flows in waves.

Trendline of labor productivity growth, total economy, % year on year



Note: Productivity defined as GDP per hour worked, US 2010 PPP. Calculated using a Hodrick-Prescott filter (lambda=6.25). Europe is the simple average of France, Germany, Italy, Spain, Sweden, and the United Kingdom. Other emerging economies: N=~20 economies in 1971–90, ~35 economies in 1990–2005, and 95 economies in 2006–19.
Source: Bergeaud, Cette, and Lecat, "Productivity trends in advanced countries between 1890 and 2012," *Review of Income and Wealth*, 2016, for US and Europe; The Conference Board Total Economy Database for China, India, Japan, other emerging economies, and global (TCB aggregate), 2023 release; McKinsey Global Institute analysis

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and India, Asian fast-lane economies include Vietnam, Bangladesh, and Cambodia.[15] The fast lane also includes a few top performers from Sub-Saharan Africa, like Ethiopia and Rwanda.

— *The middle lane has economies from every region, slowly converging with advanced economies.* In 30 economies, with 1.3 billion people, productivity growth has been broadly in line with expectations given their starting points. Between 1997 and 2022, they averaged 2.1 percent productivity growth—twice the rate of advanced economies. At this rate, an economy with an average middle-lane productivity of $36,000 per worker in 2022 would take about 130 years to converge with the advanced-economy average. Emerging Asia dominates this lane, which also includes economies from Sub-Saharan Africa (Tanzania,

[15] Russia and Ukraine, larger economies with significantly slower productivity growth than Estonia, Lithuania, and Latvia, depress the Eastern European average.

Kenya, and Uganda) as well as some relative outperformers from Latin America and the Caribbean (Peru, Costa Rica, and the Dominican Republic), among others.

— *Economies in the slow lane, largely from Latin America and the Caribbean, Sub-Saharan Africa, and the Middle East and North Africa, have not converged at all.* These 31 economies have 1.4 billion people, almost one-third of whom live in poverty.[16] Their productivity has grown at an average rate of 0.3 percent. Several of them not only failed to narrow the gap with advanced economies over the past 25 years but actually fell further behind. At this pace, they would never converge with advanced economies.

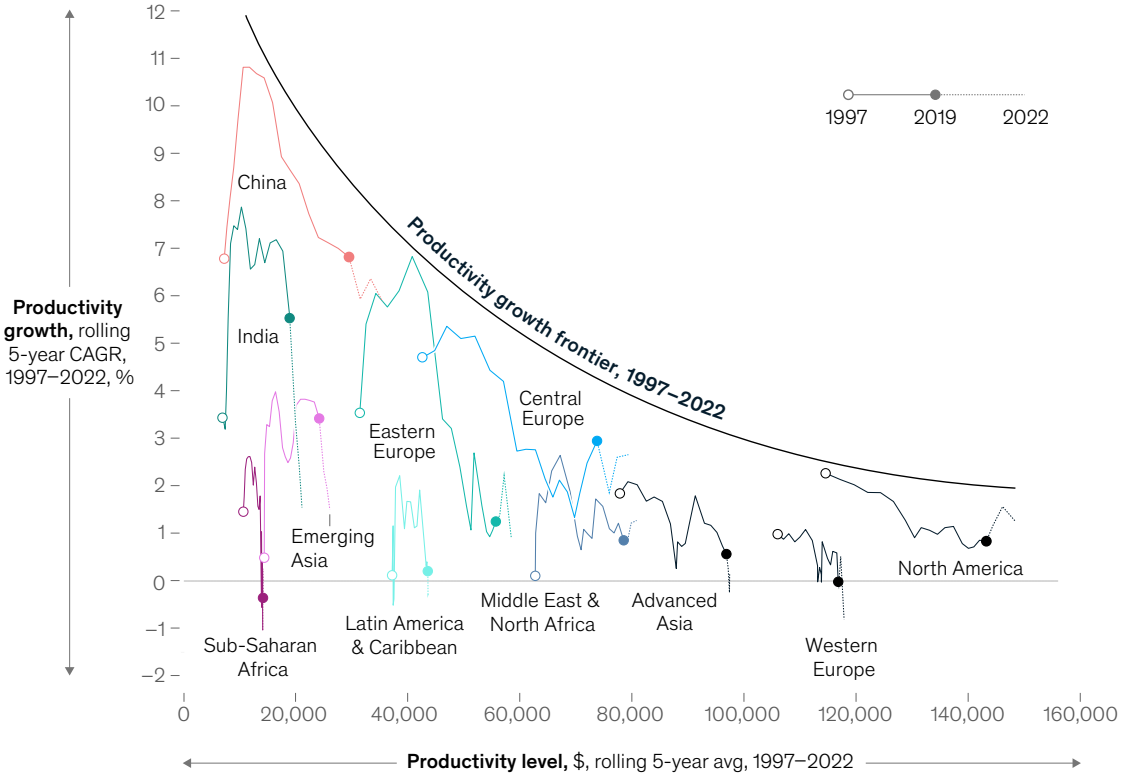
Fast-lane regions carved out the productivity growth frontier, thanks to strong increases in capital per worker

Taking a regional view over time, China, Eastern Europe, Central Europe, Advanced Asia, and North America each defined the "frontier" of growth possibilities at different stages of development over the past 25 years (Exhibit 4).[17] Thanks to internal reforms and global

Exhibit 4

Fast-lane regions carve the path of the productivity frontier.

Productivity level and productivity growth per employee



Note: N=242, weighted averages for 11 regions in 21 rolling 5-year periods.
Source: The Conference Board's Total Economy Database, "Output, Labor, and Labor Productivity"; McKinsey Global Institute analysis

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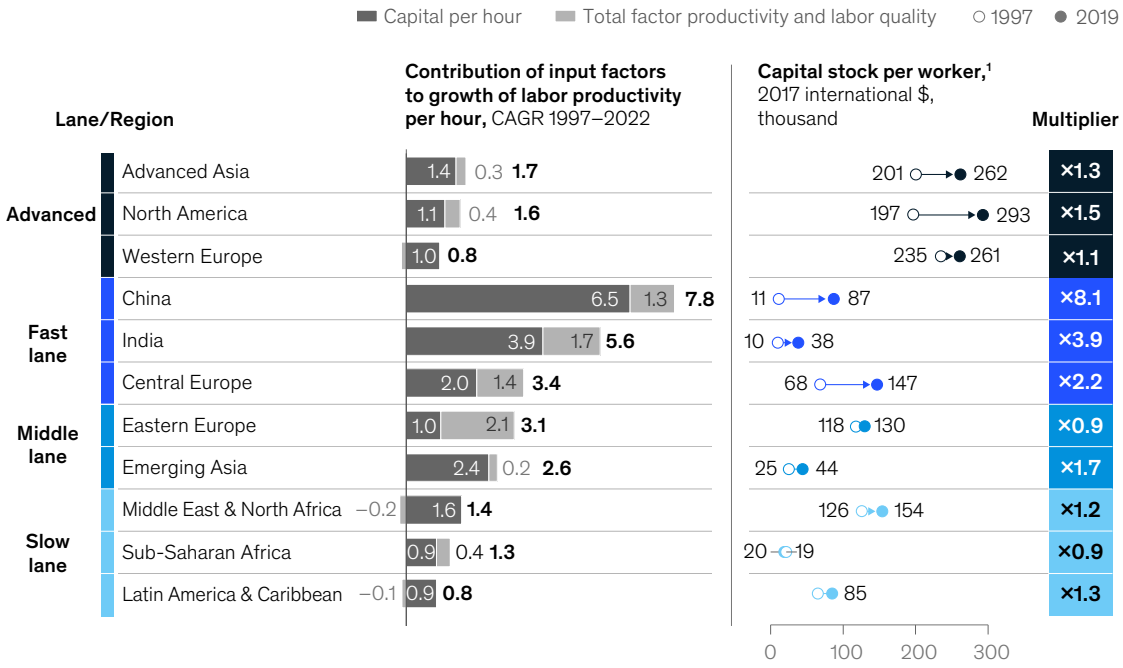
[16] People living with less than $3.65 a day (2017, purchasing-power parity). Poverty and inequality platform, World Bank, 2019 or closest data point available.
[17] On the exhibit, productivity level (x-axis) is a five-year rolling average, while productivity growth (y-axis) represents five-year rolling cumulative annual growth rates.

integration, China produced the highest growth rates and took its output from only $6,000 per worker to more than $40,000. Central and Eastern Europe also achieved rapid progress, particularly during the integration period with Western Europe. Central Europe doubled output per worker to more than $80,000. Meanwhile, Latin America and Sub-Saharan Africa stayed well below the productivity frontier throughout the period.

Across all regions, the standout driver has been increasing capital per hour; in most places, it accounted for 70 to 80 percent of overall productivity growth.[18] China and India led the way, with growth in capital per hour contributing 6.5 and 3.9 percent to productivity growth, respectively (Exhibit 5). They started in 1997 with capital stock of just $10,000 to $11,000 per

Exhibit 5

Increasing capital per hour has been the main driver of labor productivity growth.



[1]Capital stocks (public and private), IMF, constant 2017 US dollars. Calculated by dividing total capital stocks by total employment. We compare 1997 to 2019 because that is the latest year available in the IMF data set.
Note: N=125 economies, excluding DR Congo, Syria, Venezuela, Yemen, Iraq, and Taiwan. Numbers may not sum due to rounding.
Source: The Conference Board's Total Economy Database, "Output, Labor, and Labor Productivity"; McKinsey Global Institute analysis

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[18] We use a Solow decomposition, breaking productivity growth down into capital per worker, labor quality, and total factor productivity (TFP) (see sidebar "Measuring productivity"). This classic decomposition has some shortcomings. Notably, measuring the contribution from capital via the factor share in output assumes constant returns to scale and substitutability of labor and capital—two assumptions that are increasingly questionable in an intangible world. There are also significant measurement differences in capital services depending on whether and how to include quality improvements in capital, for instance, from better and cheaper machines and electronics. In this decomposition, we use The Conference Board's data set, which strongly weights these improvements via so-called hedonic deflators. As a result, a large portion of capital-embodied technical change will be shown as capital per worker instead of TFP, in line with the notion that all sectors and economies that are not producing these technologies can simply buy them as capital. Other data sets use smaller deflators of capital, so quality improvements show up as TFP growth instead of growth in capital per worker, resulting a larger relative contribution of TFP. Generally, capital still dominates in these cases, just less overwhelmingly.

person, about 5 percent of the level in advanced economies.[19] Both economies then invested heavily in urbanization, infrastructure, businesses, and manufacturing facilities. They multiplied their capital stock per worker by factors of eight and four, respectively, and contributed about 45 percent of global capital formation. Central Europe and Emerging Asia were the closest followers, roughly doubling their capital stocks.

Switching lanes is possible

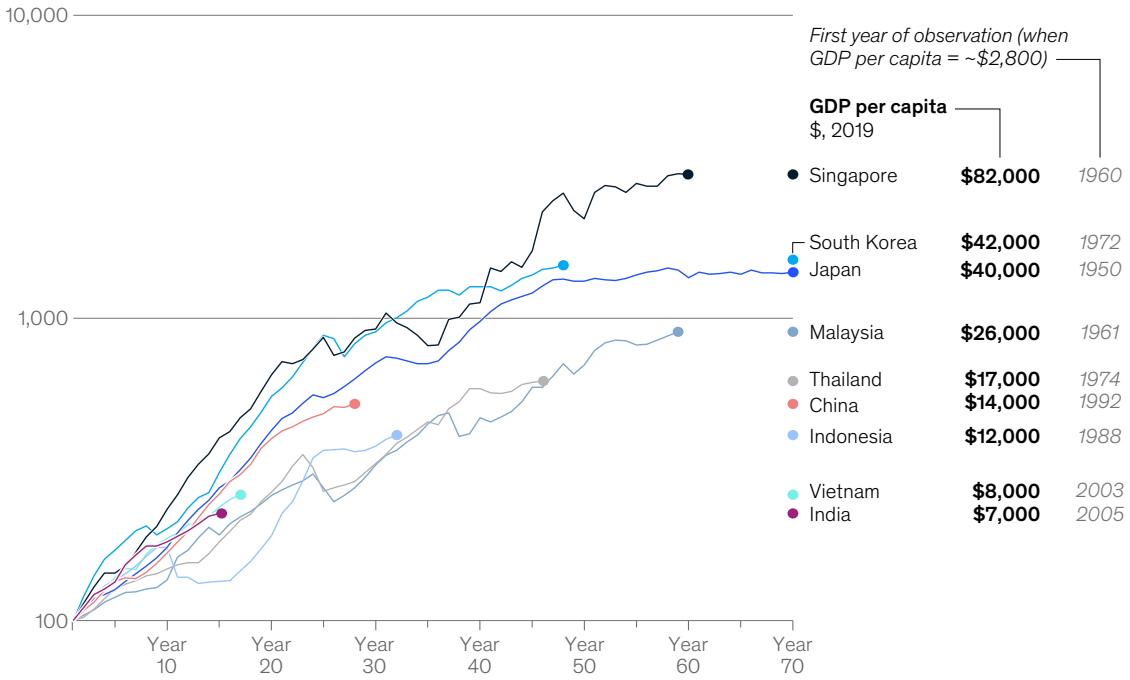
Although the successes of China and India over the past quarter century may seem miraculous, they are not unique. China and India were once slow growers, and they have recently been following the paths previously taken by economies such as Japan and South Korea (Exhibit 6).

Similarly, an economy in the middle or slow lane can take steps to enter the slipstreams of faster productivity growth, lifting standards of living in the process. From 2014 to 2019, for example, the Philippines grew its productivity at an annual rate of 4.5 percent, Thailand at 3.7 percent, and Malaysia at 3.0 percent. In Africa, Tanzania (4.7 percent), Cameroon (4.2 percent), and Kenya (4.0 percent) each achieved fast-lane rates over the same period.

Exhibit 6

China and India seem miraculous but are not unique.

GDP per capita, output-side real GDP at chained PPP, 2017 US$, 100 = ~$2,800 (log scale)



Source: Penn World Table, 10.01 release; see also Fernández-Villaverde, Ohanian, and Yao, *The neoclassical growth of China,* 2023; McKinsey Global Institute analysis

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[19] International Monetary Fund (IMF), constant 2017 dollars. Calculated by dividing total capital stocks (sum of private capital stock and general government capital stock) by total employment from The Conference Board (Total Economy Database, "Output, Labor, and Labor Productivity"). The last year available from the IMF data set is 2019, hence this is the final year we use. The contribution of growth in capital per worker and growth in capital stocks per worker are not directly comparable. The contribution (left side of the exhibit) has been weighted by each economy's capital share, ends in 2022, and comes from The Conference Board, while the stocks (right side of the exhibit) are unweighted, end in 2019, and come from the IMF.

Productivity growth and the pace of convergence have slowed since the GFC

In recent years, progress in emerging economies has slowed across all three lanes (Exhibit 7). This means the pace of convergence with advanced economies has been decelerating, as shown in Exhibit 4 by the almost universal inverted U-shape in each region's trajectory. The growth rates of emerging economies have been falling toward those of advanced economies, despite their significantly lower productivity levels. The pandemic accelerated this negative trend from 2020 to 2022, though productivity numbers during crises should be interpreted with care.[20]

Productivity growth in advanced economies had already slowed before the GFC, falling from an average of 2.2 percent per year between 1997 and 2002 to 1.6 percent between 2002 and 2007. Since then, it has declined to less than 1 percent. Across North America, Western Europe, and Advanced Asia, the persistence of the slowdown, more than a decade after the GFC, is striking. The United States was one of the few advanced economies that managed to rebound slightly in the final years preceding the COVID-19 pandemic. Yet even there, productivity growth rates for 2018 and 2019 (0.9 percent and 1.6 percent, respectively) would not be enough to conclude that the economy was on a new acceleration path.

For emerging economies, all three lanes experienced an acceleration in the run-up to the GFC, but the surge did not last. Almost all fast-lane economies suffered sharp declines after the GFC, though the lane as a whole stayed above its 1997–2002 pace thanks to China and India's large and growing weight.[21] The slow lane (largely populated by economies in Sub-Saharan Africa, Latin America and the Caribbean, and the Middle East and North Africa, with some notable exceptions) experienced sluggish growth of 2.1 percent before the GFC, then turned negative for the entire 2012–22 period.

If capital per worker explained most of high productivity growth for 25 years, did it also drive the slowdown? In advanced and fast-lane economies, slower growth in capital per worker after the GFC does indeed explain a lot. By contrast, middle-lane economies had higher capital deepening after the GFC than they did before it (in part because the Asian financial crisis of 1997 choked off investment). In the slow lane, growth in capital per worker was low all along, explaining persistently slow productivity growth. Beyond capital, other factors that had accelerated before the GFC weakened after it. These include slower growth in international trade and the integration of global supply chains, which hindered advances in the economic complexity of exports, slower progress of institutional reforms, and less favorable demographic trends.[22]

In recent years, the growth rates of emerging economies have been falling toward those of advanced economies.

[20] Productivity behavior during economic crises is often volatile and not necessarily reflective of longer-term trends, and measurement issues can arise during turbulent times. We remain vigilant, because the pandemic could indeed leave scars on long-term productivity growth, but for now we put less weight on the past four years.

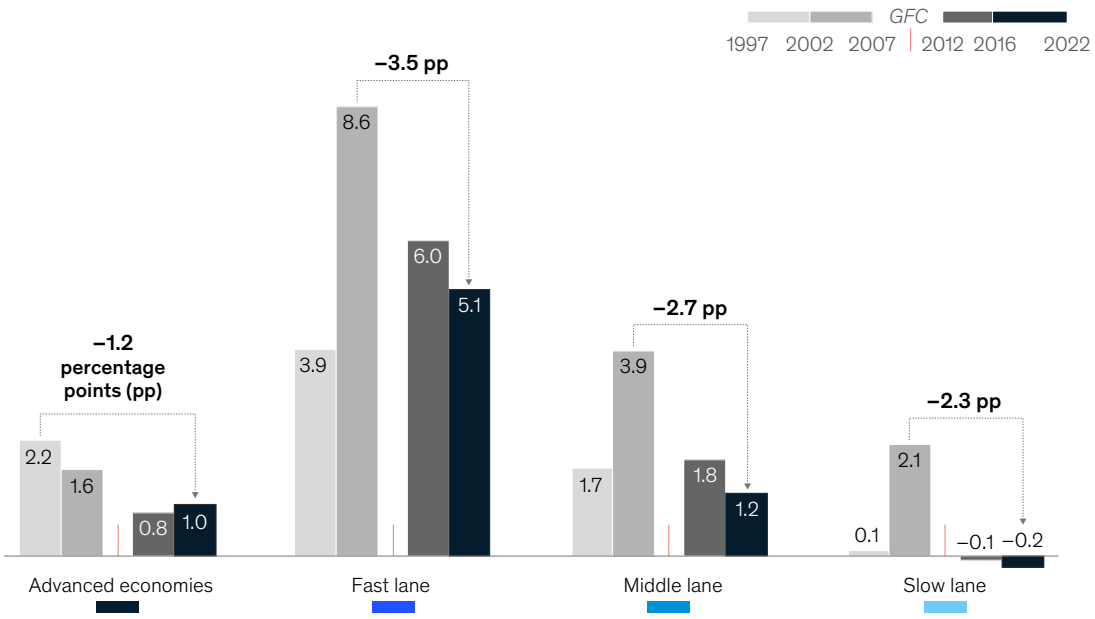
[21] One way to eliminate the effect of China's and India's size is to take simple instead of weighted averages, so that each economy's weight is the same. If we do that, fast-lane productivity growth in the four periods was 4.4, 6.1, 1.9, and 2.2 percent, respectively, indicating a much sharper slowdown.

[22] *Global productivity: Trends, drivers, and policies*, World Bank, 2023.

Exhibit 7

Productivity slowed across all lanes and regions after the global financial crisis—a trend that started even earlier in advanced economies.

Productivity growth per hour, %



Lane/Region		1997–2002	2002–07	GFC	2012–16	2016–22	Productivity growth per hour, 3-year rolling average, %
		High growth			Low growth		
Advanced	Advanced Asia	2.4	2.1		1.5	1.2	
	North America	2.6	1.9		0.6	1.2	
	Western Europe	1.5	1.1		0.6	0.5	
Fast lane	China	5.9	10.9		6.9	6.6	
	India	3.4	7.7		6.9	3.1	
Middle lane	Central Europe	5.0	4.8		1.5	2.9	
	Eastern Europe	4.4	7.0		0.9	1.7	
	Emerging Asia	0.5	3.8		3.4	2.9	
Slow lane	Latin America & Caribbean	–0.1	2.2		0.6	0	
	Middle East & North Africa	0	2.5		1.7	1.5	
	Sub-Saharan Africa	1.6	2.7		0.7	–0.1	

1998 2021

Note: 2022 international dollars, PPP, weighted average per group. N=125 economies, excluding DR Congo, Syria, Venezuela, Yemen, Iraq, and Taiwan.
The Conference Board's Total Economy Database, "Output, Labor, and Labor Productivity"; McKinsey Global Institute analysis

McKinsey & Company

2. Advanced economies: The breaking waves of productivity

In this section, we unpack the causes of declining productivity growth in advanced economies. We look in particular at various factors and sectors for the United States, Japan, and the five largest economies of Western Europe, which together represent 78 percent of GDP in all advanced economies.[23]

While many drivers affect productivity growth, two stand out for explaining the performance of advanced economies in recent years. First, manufacturing experienced waves of productivity advances fueled by the effects of Moore's law and a burst of offshoring and restructuring. (Moore's law, which holds that the number of transistors in a microchip doubles every two years, signals more broadly that computers become more powerful and efficient while coming down in cost.) These waves yielded productivity gains before the GFC but petered out over time. The second major factor is a secular decline in investment across multiple sectors (Exhibit 8). These two trends explain the slump in advanced economies almost entirely.[24] Digitization was much discussed as the main candidate to rev up productivity again, but its impact failed to spread beyond the information and communications technology (ICT) sector.

The implications of the slowdown are significant. If the United States had not had a manufacturing slowdown, its GDP per capita in 2022 would have been around $5,000 higher. If growth in capital per worker had not declined, it would have been around $4,500 higher.[25] Overall, if the United States had continued growing its productivity at pre-GFC rates, its GDP per capita would have been $8,900 higher in 2022. In Germany, France, and the United Kingdom, per capita income could have been $3,500 to $5,900 higher; in Japan, it could have been about $1,700 higher. Yet economies could reverse these trends in the years ahead. If they invest to regain pre-GFC productivity growth, advanced economies stand to gain between $1,500 (Japan) and $8,000 (United States) in incremental GDP per capita by 2030.

[23] The European economies are France, Germany, Italy, Spain, and the United Kingdom, which together represent 74 percent of continental GDP. Our data set for this analysis is EU KLEMS, which allows us to go deeper into specific sectors but covers only some advanced economies. We also end the post-GFC period in 2019 because the data stops in 2020, but figures for 2020 are highly distorted by the COVID-19 pandemic. A minor discrepancy is that capital per worker tends to appear larger in data from The Conference Board than in EU KLEMS, which uses hedonic deflators for ICT capital stocks.

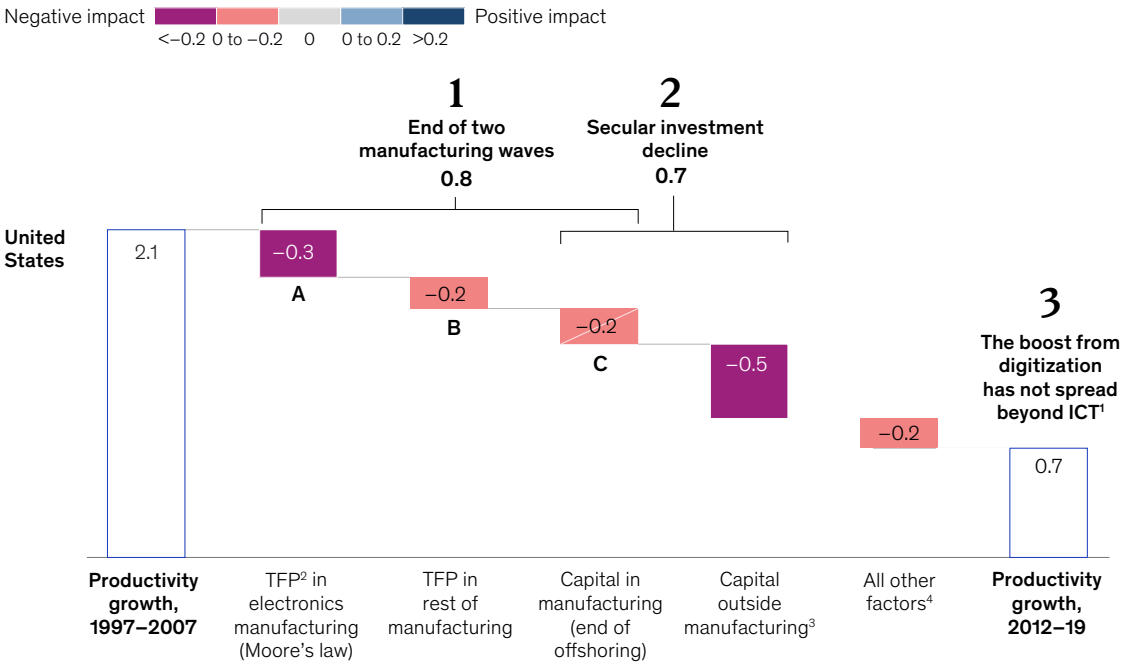
[24] Beyond manufacturing and investment, across economies, other, smaller factors either helped or hindered, but these two were dominant. Together, they account for about 90 percent of the slowdown in the United States, 100 percent in Germany, 110 percent in the United Kingdom, and 140 percent in Japan. A number larger than 100, as in Japan and the United Kingdom, means that other drivers boosted productivity growth and partially made up for the manufacturing and investment effects. The trajectories in Spain and Italy were different than in the other advanced economies because they did not have an aggregate productivity growth slowdown—their growth was sluggish all along. And yet manufacturing and investment slowed productivity growth substantially, too. The reason aggregate productivity growth remained stable in these two economies is that other drivers compensated for the negative contribution of manufacturing and investment. France was the only economy where the combination of manufacturing and investment, while still relevant, accounting for roughly 40 percent of the slowdown, did not explain it entirely.

[25] Note that these two figures cannot be simply added together. There is some overlap between them, owing to capital per worker in manufacturing, as well as a small drag not accounted for by either of these two drivers.

Exhibit 8

Manufacturing and capital investment explain the recent productivity growth slowdown in advanced economies.

Productivity growth, %



Japan	1.5	–0.2	0.0	–0.2	–0.2	0.2	1.1
UK	1.9	–0.1	–0.6	–0.1	–0.6	0.2	0.6
Germany	1.6	–0.1	–0.3	0.0	–0.3	0.0	0.8
France	1.6	–0.1	–0.3	–0.1	0.2	–0.5	0.9
Italy	0.4	0.0	0.1	–0.1	–0.4	0.3	0.3
Spain	0.2	0.0	–0.2	–0.1	–0.4	0.8	0.4
Europe top 5[5]	1.1	–0.1	–0.3	–0.1	–0.3	0.2	0.6

[1]The information and communications technology sector.
[2]Total factor productivity.
[3]In the US, wholesale and retail was the only sector where investment increased (+0.1 pp).
[4]Heterogeneous performance (ups and downs) across sectors in terms of TFP and labor quality. For instance, in the US: decrease in half of the sectors (–0.5 pp), mostly driven by retail and financial services and partially offset by increase in other sectors (+0.3 pp), eg, professional services and construction.
[5]Simple average of Europe's five largest economies (Germany, France, UK, Italy, Spain).
Note: Numbers may not sum due to rounding.
Source: EU KLEMS, 2023 release, national accounts and growth accounts; McKinsey Global Institute analysis

McKinsey & Company

Two waves of productivity growth in manufacturing have ended

Two cresting waves explain much of the rapid productivity growth in manufacturing until the mid-2000s as well as the subsequent slowdown. First, Moore's law (the doubling of the number of transistors in a microchip every two years) translated into price declines and rapid consumer gains. But this effect waned over time, slowing total factor productivity (TFP) growth in electronics manufacturing (Exhibit 8, 1A).[26] Second, before the GFC, the automation, restructuring, and offshoring of labor-intensive production boosted capital per worker in manufacturing, while advanced economies retained primarily capital-intensive (and knowledge-intensive) activities. But that effect petered out, too (Exhibit 8, 1C). There was also a slowdown in TFP growth in manufacturing subsectors other than electronics, with multiple causes depending on the subsector, though none standing out (Exhibit 8, 1B).[27]

These waves caused strong pre-GFC growth in both electronics and other manufacturing, which significantly contributed to aggregate productivity growth (Exhibit 9, US example).[28] As their contribution waned after the GFC, so too did productivity growth in the overall economy (see sidebar "A detailed economy-sector view of the productivity slowdown and the mix effect" for a comprehensive economy-by-economy and sector-by-sector analysis).

Moore's law translated into price declines and rapid consumer gains, but the effect waned over time.

[26] See sidebar "Measuring productivity" for an explanation of the decomposition of productivity growth into input factors: capital per worker or per hour, labor quality, and TFP.

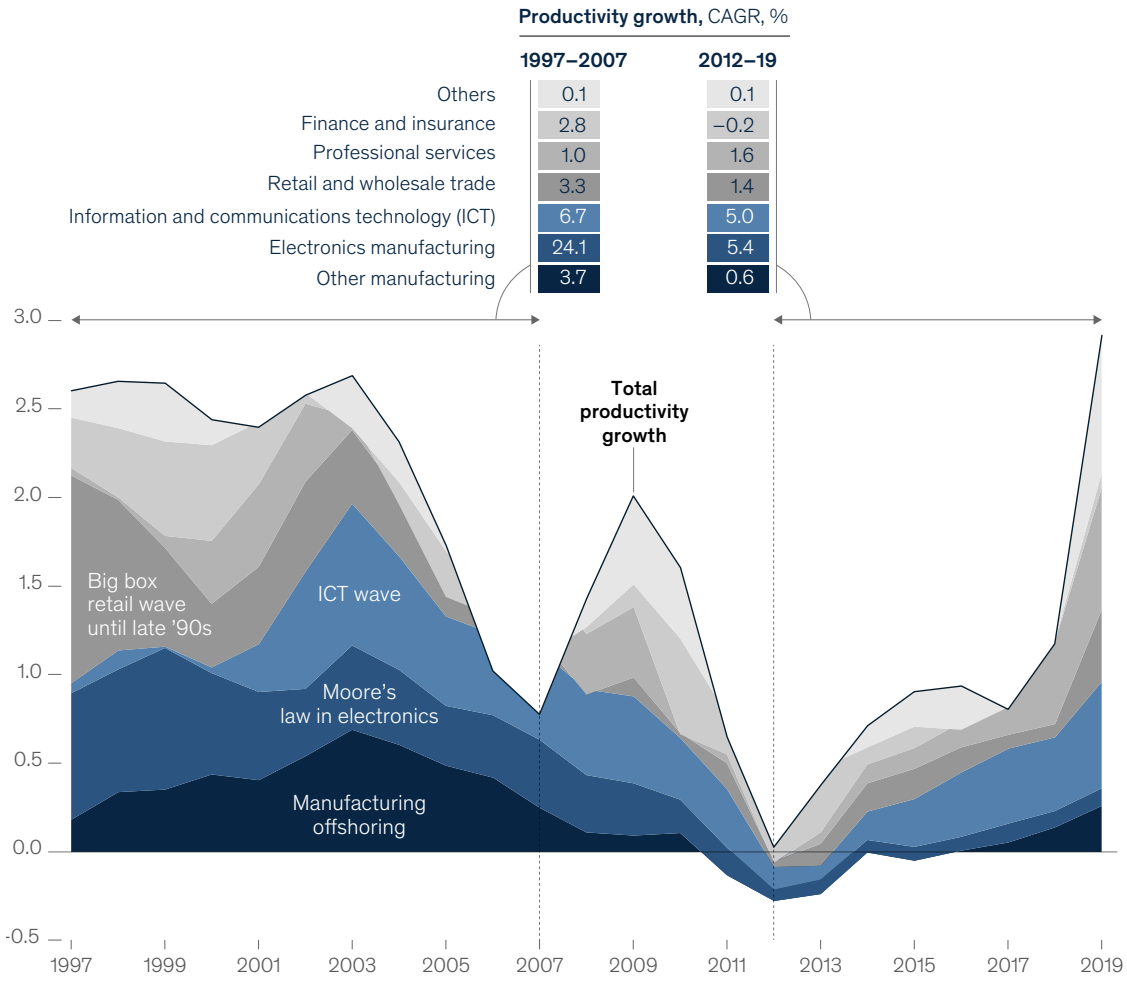
[27] Only the coke and refined petroleum products subsector was consistently positive across economies; the rest were overwhelmingly negative. Sector contributions to the slowdown were generally very small and spread out, with no sector beyond electronics dominating. The next major contributors across economies beyond electronics, even if not dominant, were machinery and equipment, automotive, and pharmaceutical products.

[28] In the exhibit, the big spike of 2019 is caused by the fact that these are three-year rolling averages. The figure for 2019 is an average of 2018, 2019, and 2020, and 2020 had unusually high productivity growth (5.9 percent) because of the COVID-19 pandemic. In 2019 alone, productivity growth in the United States was 1.6 percent.

Exhibit 9

In the United States, productivity growth was slowing in manufacturing before the global financial crisis.

US productivity growth per hour, sector contribution, 3-year rolling average,[1] 1997–2019, %



[1]All industries except real estate. The value of each year is the average of that year, the previous, and the next. The large spike in 2019 is caused by the fact that these are three-year rolling averages. The figure for 2019 is an average of 2018, 2019, and 2020, and 2020 had unusually high productivity growth (5.9 percent) because of the COVID-19 pandemic. In 2019 alone, productivity growth in the United States was 1.6 percent.
Source: EU KLEMS, 2023 release; McKinsey Global Institute analysis

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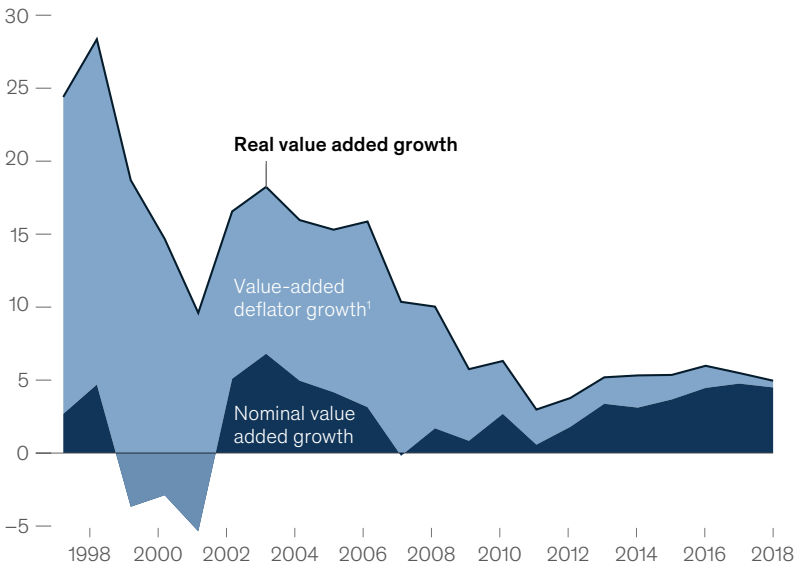
The declining value of Moore's law

While most manufacturing subsectors suffered a productivity slowdown, electronics was the main culprit. The main reason was slowing growth in consumer value derived from the effects of Moore's law (Exhibit 8, 1A). While nominal value added growth was relatively stable, product performance per unit of price surged in the late 1990s and early 2000s, and subsequently fell. Hence, despite the ongoing progress of Moore's law, the translation into real value added

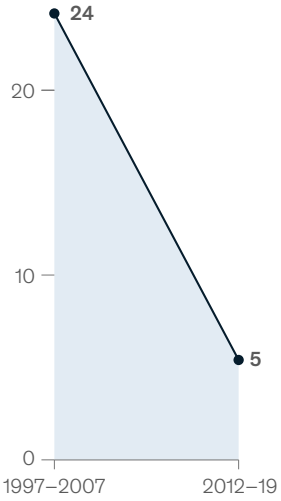
Exhibit 10

Moore's law is producing diminishing returns in US computer and electronics manufacturing.

US rate of quality improvement in computers and electronics, growth in real value added and nominal value added, 3-year rolling average, 1997–2018, %



Computer and electronics manufacturing productivity growth, CAGR, 1997–2007 and 2012–19, %



[1]A measure of changes in prices and quality over time. Nominal value added represents the total value of goods produced. Economists are interested, however, in real value added, which gets adjusted for changes in prices and improvements in quality. The value-added deflator is an index that captures these changes and is applied to nominal value added to transform it into real value added.
Source: EU KLEMS, 2023 release, national accounts; McKinsey Global Institute analysis

McKinsey & Company

slowed.[29] Technically, this shows up as lower growth in the value-added deflator (Exhibit 10, US example).[30] This was true in the United States, Japan, the United Kingdom, Germany, and France (but particularly stark in the United States and Japan because they benefited from a larger positive pre-GFC wave).

In the United States, productivity growth in electronics manufacturing fell from 24.0 to 5.4 percent, explaining about 40 percent of the slowdown in all of manufacturing and 20 percent of the economy-wide decline. This was despite the fact that this sector represents about 1 to 2 percent of employment and value added; this small part of the economy had an outsize effect. The other

[29]Productivity is defined as real value added divided by hours worked. Real value added, in turn, is calculated as nominal value added, or total output, adjusted with a deflator. This deflator takes into account not only price inflation but also product quality. For example, even if a 2020 model small car has the same price as its 1997 equivalent, it has many more quality features, so its real value added will be much larger. For electronics manufacturing, we observe that nominal value added growth is stable, while real value added growth declines sharply. In other words, most of the decline in electronics manufacturing productivity growth is explained by the deflator, which accounts for price changes and product quality improvements.

[30]There is debate on whether the effects of Moore's law actually slowed or not in recent years, while it took increasing amounts of investment to honor it. For discussion, see Kenneth Flamm, "Measuring Moore's Law: Evidence from price, cost, and quality indexes," in *Measuring and accounting for innovation in the twenty-first century*, National Bureau of Economic Research, University of Chicago Press, 2021; Nicholas Bloom et al., "Are ideas getting harder to find?," *American Economic Review*, volume 110, number 4, April 2020; and "Jensen Huang says Moore's law is dead. Not quite yet," *Economist*, December 13, 2023. Price declines stemming from Moore's law are not the only reason productivity growth in electronics accelerated in the late 1990s and early 2000s then decelerated. Feenstra et al., for example, argue that terms-of-trade gains and tariff changes affected the measurement of IT prices, overstating US productivity gains before the GFC. Robert C. Feenstra et al., "Effects of terms of trade gains and tariff changes on the measurement of US productivity growth," *American Economic Journal: Economic Policy*, volume 5, number 1, February 2013.

manufacturing subsectors dropped from 3.7 to 0.6 percent. In our Western European sample, on average, growth in electronics productivity declined from 8.9 to 2.4 percent, explaining a fifth of the manufacturing slowdown (with the United Kingdom and Germany experiencing larger declines off a higher base); other subsectors declined from 3.0 to 1.3 percent. In Japan, electronics declined from 12.6 to 3.7 percent; the other subsectors went from 1.8 to 1.4 percent.

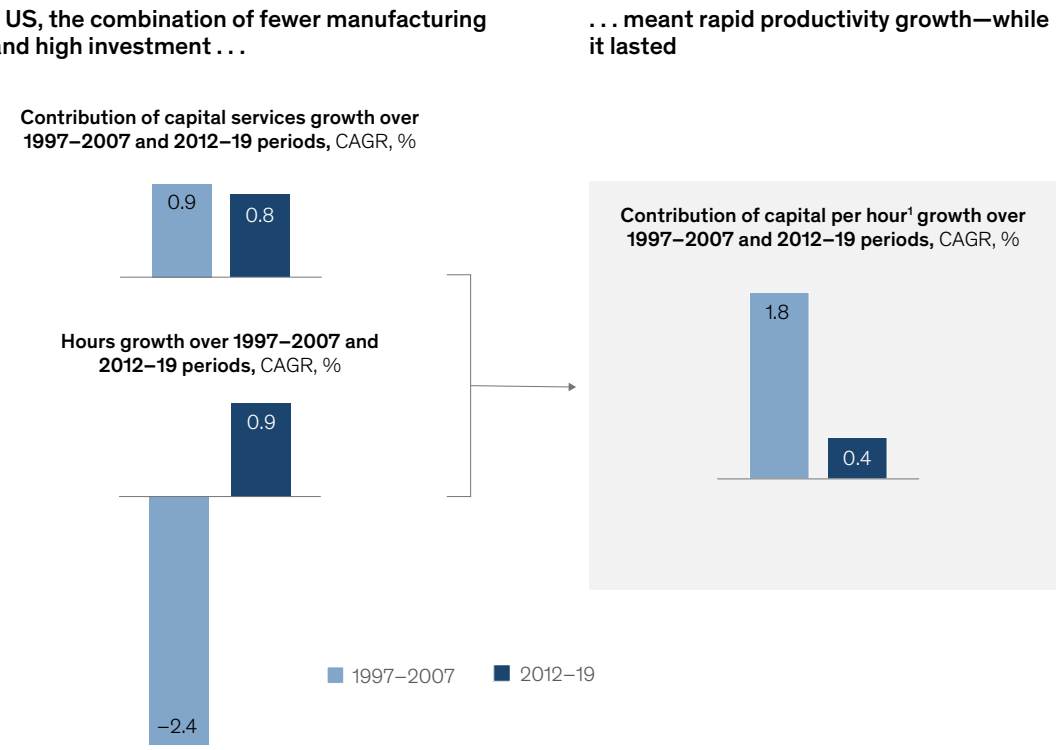
The end of an offshoring and restructuring wave

Productivity growth in manufacturing also slowed after the GFC with the breaking of the offshoring and restructuring wave (Exhibit 8, 1C).[31] In the late 1990s and early 2000s, labor-intensive manufacturing jobs in many advanced economies were either moved to places where labor was cheaper (often to China but also to Mexico, Central Europe, or Eastern Europe) or automated.[32]

In the United States, these choices led to a decline in manufacturing hours worked of 2.4 percent per year between 1997 and 2007 (Exhibit 11). Capital investment did not suffer an

Exhibit 11

A wave of offshoring and restructuring in manufacturing has ended.



[1]Capital per hour is measured as capital services per hour growth, weighted by the capital share.
Source: EU KLEMS 2023 release, growth accounts and national accounts; McKinsey Global Institute analysis

McKinsey & Company

[31] As the exhibit shows, this affects both the manufacturing and investment slumps.

[32] One of the commonly discussed drivers of the shrinking of manufacturing is "exporting productivity to China." In most advanced economies, the value added of net exports to China has decreased markedly since the mid-1990s but remains below 1 percent of GDP. The sharpest decrease in net exports to China occurred from 1997 to 2007, driven mostly by manufacturing subsectors such as electronics and textiles, and remained relatively stable from 2012 to 2018. This drove an acceleration in manufacturing productivity growth from a wave of rationalization and offshoring, which ebbed in the late 2000s when global supply chains matured. (Based on analysis of the OECD's TiVA data set.)

equivalent decline, resulting in a boost in capital per worker and hence productivity growth, presumably because the parts of manufacturing that remained required ongoing investment to stay on the frontier. Once the offshoring and restructuring wave ended, the hours worked in manufacturing resumed growth, and growth in productivity and capital per worker slowed to more moderate levels. A similar pattern emerged in Europe and Japan. In Germany, a 0.6 percent decline in hours worked reversed to 0.5 percent growth, and in the United Kingdom, a 3.7 percent decline became 0.3 percent growth. In France the decline continued but slowed, going from a 1.5 percent reduction to 0.4 percent, and in Japan from 2.0 percent to 0.6 percent. Of these economies, only Germany saw equivalent growth in capital services.

A secular investment decline also weakened productivity growth

A marked and persistent decline in the growth of capital per worker explains the other half of the post-GFC productivity slowdown in the United States, Germany, the United Kingdom, and Japan.[33]

The slump in capital investment slowed productivity growth beyond manufacturing by 0.5 percentage point in the United States, 0.3 point in our Western European sample economies, and 0.2 point in Japan, accounting for about 30 to 50 percent of their overall slowdown (Exhibit 8, 2). This decline spanned almost all sectors: in the United States, the only exceptions were mining and agriculture; in Europe, only mining, construction, and finance and insurance generally remained stable, while real estate accelerated.

More specifically, slowing growth in tangible capital (for example, machines, equipment, and buildings) explains almost 90 percent of the drop in the United States and 100 percent in Europe. From 1997 to 2019, gross fixed capital formation in tangibles fell from 22 to 14 percent of gross value added in the United States and from 25 to 17 percent in Europe. Intangible capital growth (for example, R&D and software) was more resilient but could not make up for falling investment in the material world. Gross fixed capital formation in intangibles increased from 12 to 16 percent in the United States and from 10 to 12 percent in Europe.[34] Investment in intangibles is needed to boost corporate performance and labor productivity, but it may face barriers (skills needed to scale up, limited collateralization and recovery value), and the productivity benefits can take longer to materialize.[35]

To complete the investment picture, we looked beyond the growth of capital per worker to net fixed investment as a percentage of GDP (Exhibit 12). Two dips occurred in most economies. The first and smaller one coincided with the end of the dot-com boom: as the bubble burst in the early 2000s, investment slowed, particularly in the United States and Europe. The larger slump occurred when the GFC hit; to date, none of the advanced economies we analyzed has seen its investment rate recover to pre-crisis levels.

[33] In Spain and Italy, capital per worker played a very similar role: it slowed productivity growth by 0.4 percentage point and 0.5 percentage point, respectively. However, in these economies, total factor productivity moved in the opposite direction, causing the aggregate economy to remain stable. France was the only economy in our advanced economies sample where capital per worker did not play a relevant role; TFP explained its entire slowdown.

[34] Simple average of Europe's five largest economies: France, Germany, Italy, Spain, and the United Kingdom.

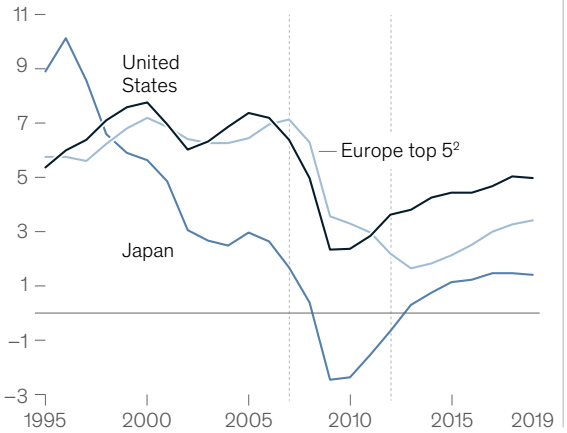
[35] *Getting tangible about intangibles: The future of growth and productivity?*, McKinsey Global Institute, June 2021; Erik Brynjolfsson, Daniel Rock, and Chad Syverson, "The productivity J-curve: How intangibles complement general purpose technologies," *American Economic Journal: Macroeconomics*, volume 13, number 1, January 2021.

Exhibit 12

The rate of net investment fell after the global financial crisis, driving lower growth of capital per hour.

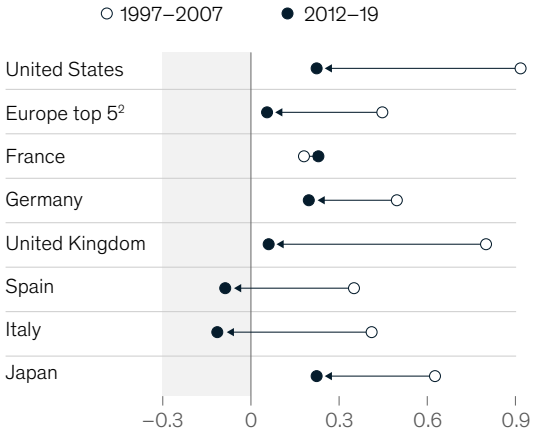
Net investment sank after the GFC and has yet to regain its pre-crisis level …

Net investment rate as % of GDP, 1995–2019



… depressing growth in capital per hour

Contribution of capital per hour growth,[1] CAGR, %



[1]Capital services per hour (or capital deepening) is calculated as capital services per hour growth, weighted by the capital share.
[2]Simple average of largest 5 European economies (Germany, France, UK, Spain, and Italy).
Source: EU KLEMS, 2023 release, growth accounts and national accounts; AMECO database; McKinsey Global Institute analysis

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Sluggish demand and macroeconomic uncertainty are likely the main culprits behind the decline in investment

Given the timing of the slumps, investment most likely fell as a result of each crisis. In their wake, the macroeconomic outlook was uncertain and demand was weak, resulting in lower productivity growth. Then, even when economic activity resumed and conditions improved, the temporary shock appeared to cause longer-term scars (or so-called hysteresis effects).[36]

Over the longer term, other macro trends such as a structural savings glut from aging, inequality, and capital inflows from emerging economies may have added to the problem, driving advanced economies into "secular stagnation" (a phenomenon marked by sluggish demand, persistent output gaps, low interest rates, and low investment).[37]

These longer-term effects and the timing of the slowdown suggest that sluggish demand played a strong role in slowing productivity growth, which contrasts with the typical supply-side-centered explanation. The virtuous cycle of growth can begin with (or be constrained by) any of its parts, including the demand side. Labor productivity growth drives higher incomes, which increase demand for products and services, which in turn encourages business investment and innovation, driving productivity growth and restarting the cycle.

On the plus side, US shale oil and gas attracted a major investment boom, with yearly capital expenditure increasing by a factor of seven between 2007 and 2014. Investment into the sector later fluctuated, but in 2023 it was still about five times higher than in 2007. Consequently, the

[36]Hysteresis is an effect whereby an economic state persists even when the factors that led to it have changed. See, for example, Olivier J. Blanchard and Lawrence H. Summers, *Hysteresis and the European unemployment problem*, National Bureau of Economic Research, working paper number 1950, June 1986.
[37] Lawrence H. Summers, "Demand side secular stagnation," *American Economic Review*, volume 105, number 5, May 2015.

United States added more output to oil and gas than any other economy in the world. However, this was not enough to offset the overall investment decline.

Regulation may have contributed to lower investment

Changing dynamics in regulation and competition policy may also play a role in holding back investment. A surge of reform swept advanced economies from the early 1980s to about the time of the GFC, with nothing comparable in the past decade.[38] Business surveys have singled out regulation as one of the central impediments to investment.[39] Other regulatory aspects, such as credit tightening in the post-crisis years (at least partially due to more stringent banking regulation), may also have contributed to lower investment and productivity growth.[40]

However, regulation is a complex topic encompassing many aspects that can enhance or hinder investment. Even the issues cited above have had mixed or unclear effects. Some evidence suggests that the relationship between credit access and productivity growth may be U-shaped—that is, productivity growth is lower with both high and low levels of credit access, and higher at a sweet spot in the middle.[41] And some studies find no relationship between increasing regulatory stringency and the lower business dynamism observed in the United States.[42]

The decline in investment was steep and sudden, occurred in both the early 2000s and 2008 (coinciding with recessions), and affected most sectors—all of which suggests that regulatory changes were probably not the main reason behind it. But some regulatory choices, including the absence of a strong new surge of pro-competition reform in the past decade, may have contributed to the investment slowdown, or at least limited its recovery in some economies.

Digitization didn't make a broad splash beyond the ICT sector

The periodic introduction of new technologies has fueled productivity growth over the past century. If Moore's law effects and offshoring added momentum at the turn of the century, it may have been unrealistic to expect their energies to continue. A burst of digital innovation might have compensated, but so far it has had a muted impact on productivity beyond the ICT sector.

The tech sector at the heart of the digital transition has indeed delivered productivity growth—in fact, the fastest growth among all sectors in the United States both before and after the GFC (6.7 percent per year before the crisis and 5.0 percent afterward; see Exhibit 9). ICT similarly had the fastest productivity growth in Western Europe. Although it slowed from 5.1 percent in 1997–2007 to 2.7 percent afterward, this was still about four times higher than overall productivity growth. In Japan, ICT productivity growth went from 1.9 to 0.5 percent. (See sidebar "A detailed economy-sector view of the productivity slowdown and the mix effect.")

[38] Robert Anderton et al. provide an illustrative example. In advanced OECD economies, the average "restrictiveness index" of regulation in network sectors (energy, transport, and communications) dropped from 5.2 out of 6.0 in 1980 to 1.8 in 2008, then flatlined. The OECD Product Market Regulation in energy, transport, communication and regulation (PMR ETCR) indicator is an index scaled from 0 to 6 (a low value corresponds to light regulation). It covers seven nonmanufacturing subsectors (telecommunications, electricity, gas, post, rail, air passenger transport, and road freight) in which anticompetitive regulation tends to be concentrated. See also Robert Anderton, Benedetta Di Lupidio, and Barbara Jarmulska, *Product market regulation, business churning and productivity: Evidence from the European Union countries*, European Central Bank working paper number 2332, November 2019; Romain Duval and Davide Furceri, "The effects of labor and product market reforms: The role of macroeconomic conditions and policies," *IMF Economic Review*, 2018; and Andrew Swiston and Stella Tam, *Productivity and product markets in Korea*, IMF working paper, October 2022.

[39] *EIB Investment Survey country overview 2023: USA*, European Investment Bank, 2024; *EIB Investment Survey: European Union overview*, European Investment Bank, 2023.

[40] Andrés Rodríguez-Pose et al., "Credit constraints, labor productivity and the role of regional institutions: Evidence for manufacturing firms in Europe," Papers in *Evolutionary Economic Geography*, number 20.53, November 2020; Romain A. Duval, Gee Hee Hong, and Yannick Timmer, *Financial frictions and the great productivity slowdown*, IMF working paper number 2017/129, May 2017.

[41] Philippe Aghion et al., *The inverted-U relationship between credit access and productivity growth*, Harvard University, August 2018.

[42] Nathan Goldschlag and Alex Tabarrok, "Is regulation to blame for the decline in American entrepreneurship?," *Economic Policy*, volume 33, issue 93, January 2018.

A detailed economy-sector view of the productivity slowdown and the mix effect

One way to decompose productivity growth, from the sector perspective, is into "within" and "mix" effects.[1] The within effect captures the impact of labor productivity growth in each sector, while the mix effect captures the impact of reallocation of labor across sectors. A shift of economic activity to low-productivity sectors (for example, from manufacturing to food services) can cause a drag on productivity and is often blamed for the slowdown.

As discussed earlier, the within effect in manufacturing contributed more than 50 percent of the productivity growth slowdown in advanced economies. Electronics manufacturing was the largest contributor within the sector, despite representing no more than 2 percent of employment across economies (Exhibit A). Other sectors had more heterogeneous, lower-magnitude impacts. For example, mining, construction, and professional and administrative services generally had a small positive effect, while agriculture, transportation, and financial services had a small negative impact.

The mix effect was small across economies. Taking an aggregate view, had the United States kept its 1997 sector mix constant, its annual productivity growth between 1997 and 2019 would have been 0.1 percentage point higher.[2] Negative trends (the shrinking of sectors with above-average productivity, like manufacturing, and the growth of lower-productivity sectors, like healthcare) were largely offset by workers shifting to high-productivity services such as ICT and professional, scientific, and technical activities. In our Western European sample economies, the mix drag was nonexistent over this period.[3]

In the United States, for example, the largest change in sectoral share from 1997 to 2019 was a 5.5-percentage-point decline in employment in manufacturing, a sector that had about 20 to 30 percent higher productivity than the economy's average in that period (Exhibit B). This shift reduced overall productivity by 1 percent, but over a 22-year period, that translates to just a 0.06-percentage-point lower annual growth rate. The bottom line is that while the mix effect is worth watching, its aggregate impact has so far been small.

[1] Our analysis first decomposes aggregate total economy labor productivity growth into a "within" and a "mix" effect using a Marshall–Edgeworth decomposition. A key characteristic of this decomposition is that it does not contain a composite (or error) component. In this formulation, labor productivity growth between time periods t–1 and t, LPt, is given by

$$\sum \frac{\left(LP_t^i - LP_{t-1}^i\right)\times 0.5\times\left(\frac{L_t^i}{L_t}+\frac{L_{t-1}^i}{L_{t-1}}\right)}{LP_{t-1}} + \frac{\frac{L_t^i}{L_t}-\frac{L_{t-1}^i}{L_{t-1}}\times\left[0.5\times\left(LP_t^i+LP_{t-1}^i\right)-0.5\times(LP_t+LP_{t-1})\right]}{LP_{t-1}},$$

where *i* refers to sector, *LP* is productivity growth, and *L* is employment.

The first term in the equation refers to the within effect (composed of sector productivity change and average employment weight), while the second and third terms refer to the mix effect (composed of employment weight change and sector productivity relative to total economy average productivity). For further discussion of decomposition methodology, refer to Javier Huerga and Lucia Stklacova, *An application of index numbers theory to interest rates*, European Central Bank working paper number 929, September 2008; and Thomas von Brasch et al., *An exact additive decomposition of the weighted arithmetic mean*, Statistics Norway, discussion paper number 944, September 2021.

[2] Estimates for total economy, excluding real estate sector.

[3] Our findings on the mix effect are consistent with a large body of literature, including *Solving the productivity puzzle: The role of demand and the promise of digitization*, McKinsey Global Institute, February 2018; and Diane Coyle and Jen-Chung Mei, "Diagnosing the UK productivity slowdown: Which sectors matter and why?" *Economica*, volume 90, issue 359, July 2023.

Exhibit A

Manufacturing explains more than half of the productivity growth slowdown across economies.

Sector contribution to change in labor productivity growth per hour, 2012–19 vs 1997–2007, percentage points, weighted by sector size[1]

	US	Japan	Europe top 5	Germany	France	UK	Spain	Italy
Agriculture								
Mining				0	0			
Manufacturing								
Manufactured electronics								
Other manufacturing								
Utilities		n/a						0
Construction				0				
Wholesale and retail trade					0			
Transportation								
Hotel and food services					0			
Information and communication								
Financial services								
Real estate								
Professional and admin. services		n/a						
Govt, defense, education, health								
Arts, entertainment, other services			0					0
Total productivity change[1]	–1.41	–0.41	–0.54	–0.78	–0.76	–1.26	0.21	–0.12

[1]Impact of productivity growth in each sector on total productivity growth. Calculated as the productivity growth of each sector multiplied by its share of total value added in nominal terms. Excludes impact of reallocation (share of total labor and relative price movement) across sectors. Note that this exhibit shows the contribution of each sector to the change in productivity growth between the two periods. In other words, it focuses on acceleration, not speed.
Source: EU KLEMS, 2023 release, national accounts; McKinsey Global Institute analysis

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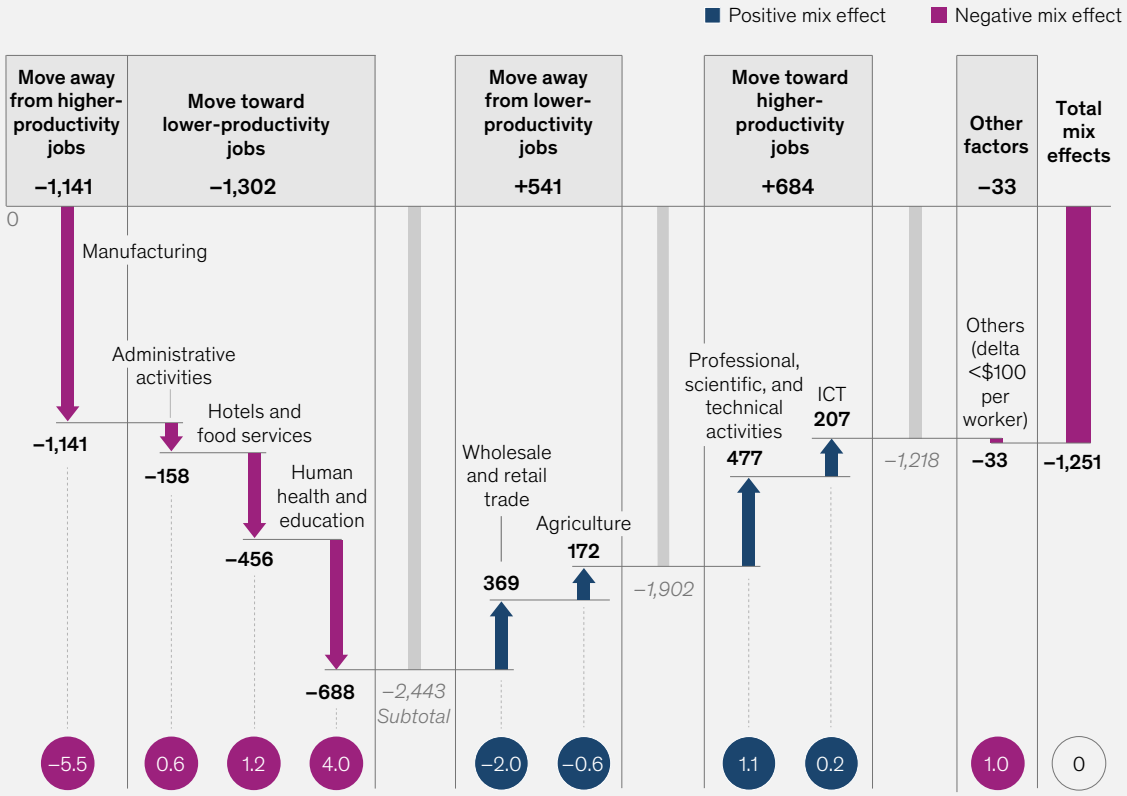
A detailed economy-sector view of the productivity slowdown and the mix effect (continued)

Exhibit B

The mix effect produced only a small drag on productivity growth.

Impact of mix change from 1997 to 2019, $ per US worker per year, by sector[1]



[1]Calculated as contribution to productivity per hour multiplied by average hours worked per person employed in each sector. All sectors excluding real estate; other factors include mining, utilities, construction, transport and storage, financial and insurance services, public administration and defense, and entertainment and other services.
Source: EU KLEMS, 2023 release, growth accounts and national accounts; McKinsey Global Institute analysis

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However, digitization has not made the same impact on productivity in other sectors—at least not yet. Three reasons might account for this: the time required for technology adoption and creative destruction, the less transformational nature of current innovation, and mismeasurement.

The first and most convincing argument is that digital and technological adoption is a long-run phenomenon. There are multiple historical precedents for a lag between the invention of a technology and its impact on productivity, from electricity in the early 20th century to computers and IT systems toward the end of it.[43] In fact, the early years of a new technology may generate a drag on productivity growth before it can be usefully adapted, with productivity following a J-shaped trajectory.[44] Digitization has also led to duplication of online and offline channels, giving customers more choice but delivering productivity benefits only when the offline channels are rationalized or discontinued. Finally, diffusing digital technologies across small businesses can be slow and difficult.[45]

A second proposed reason is that digital and other innovations of the past decade may be simply less transformational than past innovations.[46] But looking ahead, there is reason for optimism about the effects manifesting. Previous MGI research has estimated that digitization and other technological advances could add 0.5 to 1.0 percent to annual productivity growth, which is substantial.[47] In healthcare, for example, telemedicine could account for up to 1.5 percentage points per year through better care quality, less time lost in waiting rooms, and better back-end processes. Other research, including from MGI, has argued that more recent advances such as AI could have an even larger impact on productivity growth.[48]

Last, it may be that current measures of productivity do not capture the increases in value added that these technologies promote. Many new benefits are incorporated into products or services free of charge, for example, which means productivity statistics do not capture them. The best available evidence suggests that mismeasurement might explain up to 10 percent of the overall slowdown in productivity growth, a relevant but comparatively small effect.[49]

[43] See, for example, Paul A. David, "The dynamo and the computer: An historical perspective on the modern productivity paradox," *American Economic Review*, volume 80, number 2, May 1991. In 1987, Robert Solow famously said, "You can see the computer age everywhere but in the productivity statistics."

[44] Erik Brynjolfsson, Daniel Rock, and Chad Syverson, "The productivity J-curve: How intangibles complement general purpose technologies," *American Economic Journal: Macroeconomics*, volume 13, number 1, January 2021.

[45] Sagit Bar-Gill, Erik Brynjolfsson, and Nir Hak, *Helping small businesses become more data-driven: A field experiment on eBay*, National Bureau of Economic Research, working paper number 31089, March 2023; Martin Prause, "Challenges of Industry 4.0 technology adoption for SMEs: The case of Japan," *Sustainability*, volume 11, number 20, October 2019.

[46] Robert J. Gordon, *Why has economic growth slowed when innovation appears to be accelerating?* National Bureau of Economic Research working paper number 24554, April 2018.

[47] *Will productivity and growth return after the COVID-19 crisis?*, McKinsey Global Institute, March 2021.

[48] Martin Neil Baily, Erik Brynjolfsson, and Anton Korinek, *Machines of mind: The case for an AI-powered productivity boom*, Brookings Institution, May 2023; and *The economic potential of generative AI: The next productivity frontier*, McKinsey & Company, June 2023.

[49] Chad Syverson, "Challenges to mismeasurement explanations for the US productivity slowdown," *Journal of Economic Perspectives*, volume 31, number 2, Spring 2017; Emily Moss, Ryan Nunn, and Jay Shambaugh, *The slowdown in productivity growth and policies that can restore it*, The Hamilton Project, Brookings Institution, June 2020; David Byrne, Stephen Oliner, and Daniel Sichel, *Prices of high-tech products, mismeasurement, and pace of innovation*, National Bureau of Economic Research, working paper number 23369, April 2017; Erik Brynjolfsson, Daniel Rock, and Chad Syverson, *Artificial intelligence and the modern productivity paradox: A clash of expectations and statistics*, National Bureau of Economic Research, working paper number 24001, November 2017. For a broader discussion of alternative GDP measurements that incorporate the value of free goods and the digital economy, see Erik Brynjolfsson et al., *GDP-B: Accounting for the value of new and free goods in the digital economy*, National Bureau of Economic Research, working paper number 25695, March 2019.

3. Emerging economies: The fast lane to prosperity

Over the past 25 years, emerging economies in the fast lane of productivity growth have caught up with advanced economies, with China and India at the forefront.

In this section, we map our three lanes against five factors commonly called out in development economics literature and find a strong match—as well as interesting nuance:

1. Radically high capital investment, at 20 to 40 percent of GDP, is the standout driver of rapid productivity growth, in most cases underpinning at least 70 to 80 percent of it.

This investment is deployed into:

2. Building cities in the right way and mechanizing agriculture, moving workers off the farm and into urban construction and service sectors;
3. Achieving distinctive productivity growth within these expanding service sectors, where capital deepening is instrumental to creating formal productive jobs; and
4. Making manufacturing more sophisticated and global, driving its output and value added beyond commodities (although often not adding employment).

All of this is enabled by:

5. Solid institutions, innovation, and education, all of which support investment but also require it.

Fast-lane economies are generally high performers across these five factors (Exhibit 13). Middle-lane economies have either not put some of the building blocks in place or have done so less successfully, while slow-lane economies have faced structural challenges such as weak institutions and high commodity dependence. Interestingly, workforce shifts from agriculture into services turn out to be of lesser importance in distinguishing the lanes. What matters is building cities and their service sectors in the right way, with significant capital investment and formal jobs.

To understand how fast-lane economies have outpaced other emerging economies, we have used sector data for 54 economies that represent 87 percent of emerging economies' GDP.[50] To illustrate our findings, we have selected 18 example economies (six each from the fast, middle, and slow lanes); they represent all regions and 72 percent of emerging economies' GDP.[51] For

[50] Out of the sample of 91 emerging economies from The Conference Board data set used in previous chapters, the analyses on sector mix and productivity are based on a sample of 54 economies: 43 economies from the Groningen Growth and Development Centre (GGDC) plus 11 Central European and Eastern European EU-member economies from EU KLEMS, because GGDC does not include economies from Central and Eastern Europe. The 43 emerging economies from GGDC represent 82 percent of the GDP of our Conference Board sample of emerging economies (91 economies), while the 11 Central European and Eastern European economies represent about 40 percent of GDP of the Central European and Eastern European regions in the Conference Board sample. The 11 economies analyzed with EU KLEMS data are Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. The Russian Federation accounts for roughly three-quarters of the GDP of Central European and Eastern European economies in the Conference Board sample, but the EU KLEMS sample does not include it. Many analyses in this section stop in 2018 because that is the last year for which GGDC data is available.

[51] The 18 sample economies we present for the sector analysis are large, representative economies from all regions. They represent more than 85 percent of GDP and population in the fast lane, more than 30 percent in the middle lane, and more than 50 percent in the slow lane.

Exhibit 13

Five elements characterize fast-lane productivity growth.

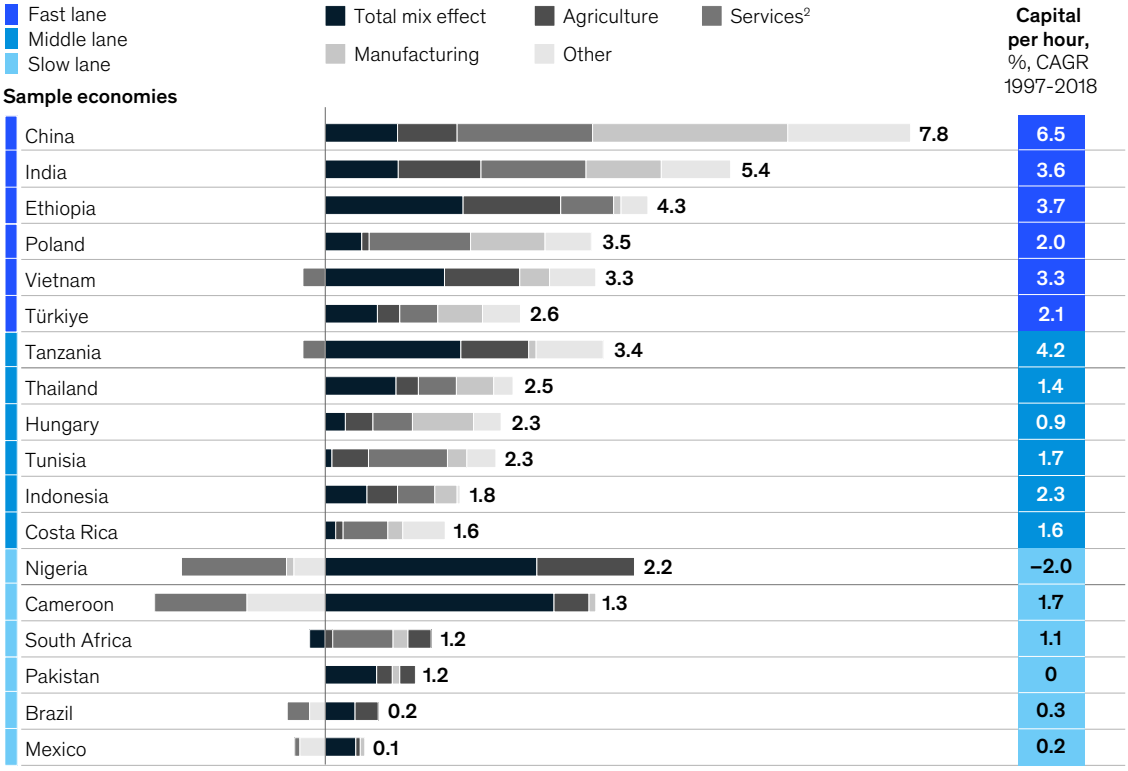
Drivers of productivity growth based on analysis for all emerging economies

High ●●●● Low

	Radically high capital investment High levels of investment (20–40% of GDP) and growth in capital per worker supporting productivity improvements throughout economies	Workforce shift from farm to cities Movement of workers off the farm and into urban construction and service sectors; mechanization and loss of redundant labor boost agricultural productivity	Distinctively high productivity growth in services Improvements within low-productivity services (trade, transport) as well as high-productivity services (business, finance), aided by capital deepening	Sophistication and globalization of manufacturing Productivity and value-added share grow, with similar employment, through diversification, sophistication, and participation in global value chains	Solid and improving productivity enablers Effective institutions, education, and innovation, among others
Fast	●	●	●	●	●
Middle	●	●	●	●	●
Slow	●	●	●	●	●

Productivity growth per employee,[1]

Gross value added (GVA) at constant 2015 prices (local currency) per person employed, %, CAGR 1997–2018



[1]Selected sample of economies. Small differences in per-economy productivity growth vs earlier exhibits looking at a larger set of economies due to different data sets used.
[2]Services include trade services, transport services, business services, and financial services.
Note: In this assessment, the second element includes the within and mix effects of agriculture, while the third and the fourth focus only on the within effect of services and manufacturing. N=18, sample economies (bottom chart).
Source: Groningen Growth and Development Centre, Economic Transformation Database; for Poland and Hungary, EU KLEMS, 2023 release, growth accounts and national accounts; McKinsey Global Institute analysis

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analyses of additional factors such as urbanization, commodity dependence, and education, we cover all the economies represented in previous chapters.[52]

Fast-lane economies invest more than the rest

Growth in capital per worker accounted for about four-fifths of productivity growth in most emerging regions over the past 25 years and for much of the difference in productivity growth between lanes, as seen in section 1. Most fast-lane economies managed to sustain investment at 20 to 40 percent of their GDP over the whole period.

Residential and commercial property are essential for the urbanization that raises growth and productivity in a modern economy. Infrastructure investments make transportation and utilities more productive and produce spillovers across the economy. Machinery and equipment, from traditional types to new sophisticated robots, complement all sorts of workers' tasks. Investment in R&D and other intangibles enables manufacturing to diversify and become more complex and productive, and it raises productivity in all types of services, from hospitals to digital and IT systems.

This is not to say that higher investment is always good, or that what economies invest in does not matter. As economies develop and returns on investment decline, rebalancing to lower investment and higher consumption is natural. Investment can stay too high for too long, ignoring low returns, which can be particularly destabilizing if it is funded by debt instead of savings. But on the whole, higher investment has been associated empirically with higher output and productivity growth, lower inflation, better fiscal and external balances, and lower poverty rates and inequality.[53]

China, Ethiopia, India, Poland, Türkiye, and Vietnam make up our sample set of fast-lane economies, and their high rates of investment multiplied their ratio of capital stock per worker (Exhibit 14).

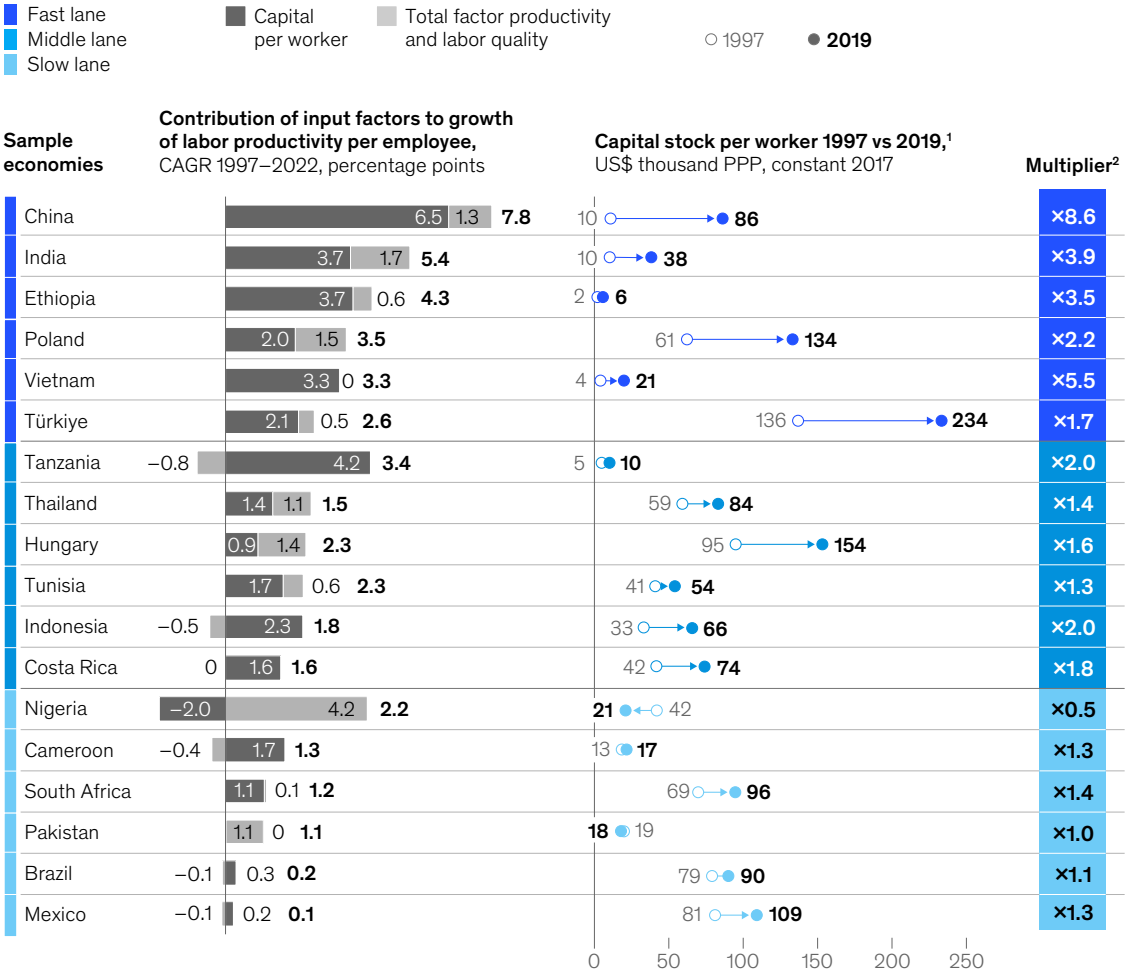
Higher investment is associated with higher output and productivity growth, lower inflation, better fiscal and external balances, and lower poverty rates and inequality.

[52] Of the 91 emerging economies from the Conference Board data set (fast, middle, and slow lanes), the data sets for commodity dependence from the United Nations Conference on Trade and Development (UNCTAD) and for urbanization, institutions, education, and R&D data from the World Bank's world development indicators cover most of them, about 85 economies each, with some differences. *Commodities and development report 2023*, UNCTAD, October 2023.

[53] *Global economic prospects*, World Bank, January 2024; see chapter 3, "The magic of investment accelerations," for a detailed study on the impact of higher investment growth.

Exhibit 14

Rising capital investment per worker has been the main driver of labor productivity growth.



[1]Capital stocks (public and private), IMF, constant 2017 US dollars. Calculated by dividing total capital stocks by total employment.
[2]Calculated by dividing 2019 capital stock per worker by 1997 Capital Stock Dataset per worker for each economy.
Note: Numbers may not sum due to rounding.
Source: The Conference Board's Total Economy Database, "Output, Labor, and Labor Productivity"; IMF, Investment and Capital Stock Dataset (ICSD), 2021; McKinsey Global Institute analysis

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In these fast-lane economies, policies set strong and stable incentives for private investment. They included opening markets to some level of competition and foreign investment, setting up efficient financial sectors, and establishing legal systems to protect ownership rights. Central and Eastern European economies that were integrated into the EU drew in foreign investment and consolidated their financial sectors. From 2004 to 2008, one-fifth of the $220 billion (€168 billion) of net foreign direct investment inflows to Central and Eastern Europe went into the financial sector.[54] Much of the rest went to modernize outdated factories and production methods. For example, vehicle production more than doubled between 2000 and 2011, while employment in the sector rose only 60 percent, resulting in a significant productivity increase.

[54] *A new dawn: Reigniting growth in Central and Eastern Europe*, McKinsey Global Institute, December 2013.

Large companies drive investment and growth, making it important to help firms scale up.[55] Larger entities have more capacity to invest and export, to adopt technology, to develop talent, to pay their workers better wages, and to adapt to shocks. Many emerging economies have large shares of small, informal businesses that find it hard to boost productivity, affecting development.[56]

Fast-lane economies also had the willingness and capacity to plow public money into critical infrastructure such as road and railway networks, power and telecommunication systems, health and education facilities, and other urban infrastructure. Ethiopia's impressive pace relied in large part on public investment, while China's capital stocks were 86 percent public by 1997 after nearly two decades of high state investment.[57] When this type of investment is very high, however, it eventually starts yielding lower returns. In China, for instance, public capital stock is already at OECD levels, but private capital per worker is still well below that point, despite remarkable increases.[58] This suggests there is scope for faster growth of private capital.

Slow- and middle-lane economies did not enjoy this pace of public or private investment growth. Even lower-income economies such as Cameroon and Pakistan that had very low capital stock per worker in 1997, comparable to China and India, achieved very little growth. Without enough savings and the policy settings to attract private and foreign investment, and without the capacity for public investment, they did not build the infrastructure, plant, machinery, and human capital needed to improve productivity growth. For example, 18 percent of Africa's urban population still lacks access to electricity, and 66 percent has no access to piped water and sewerage systems.[59]

Urbanization shifts workers away from farms and into services and construction

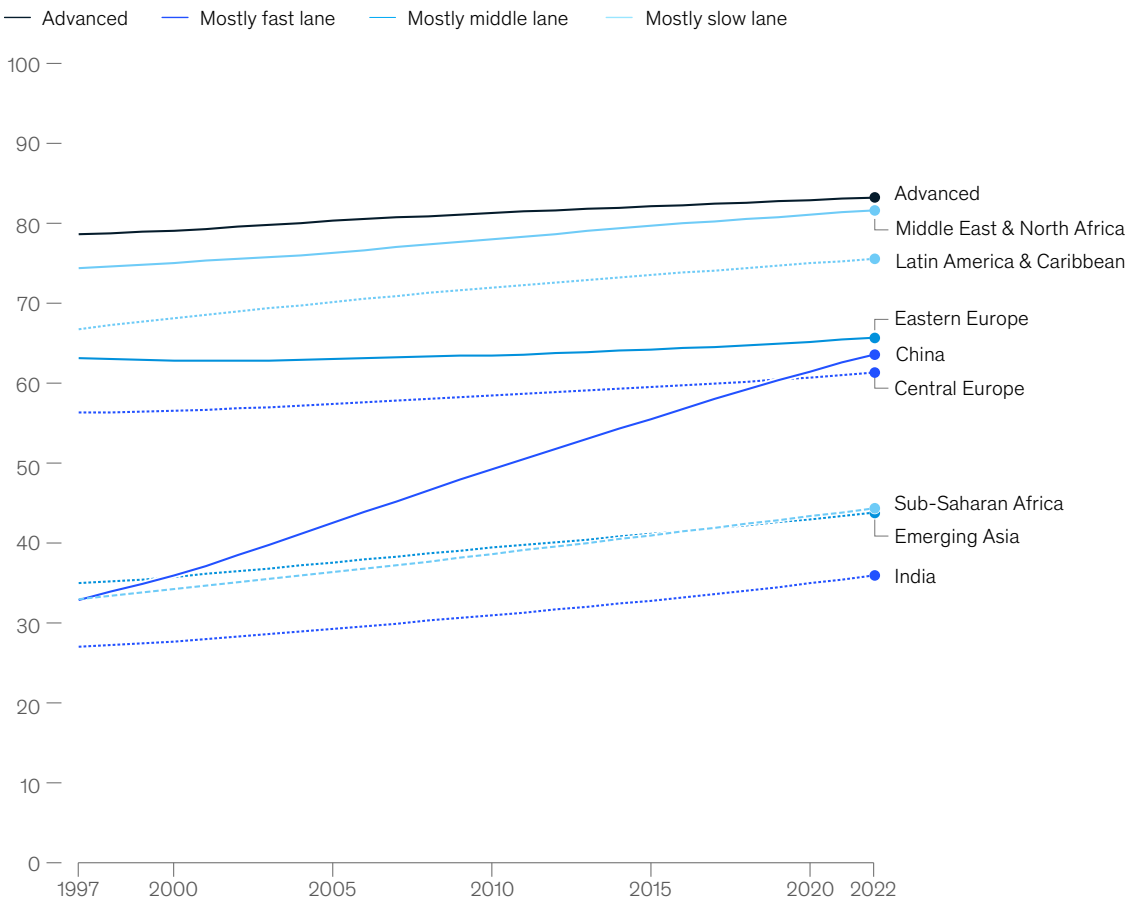
Enabled by investment in infrastructure, urbanization has meant a major shift in the composition of economies, away from agriculture and into the construction and service-sector jobs that concentrate in cities (Exhibit 15). The urban share of the population in emerging economies has increased on average by nearly ten percentage points over the past quarter century, with remarkable cases across regions (China's share grew by 31 percentage points, Costa Rica's by 26 points, Albania's by 24 points, and Botswana's by 22 points). Urbanization itself is a weaker differentiator of fast-lane economies than the other factors discussed in this section; many middle- and slow-lane economies also urbanized rapidly. How urbanization is harnessed is what makes the difference.[60] Fast-lane economies were better able to develop their cities' infrastructure and buildings as their workforce was moving there, creating an environment more conducive to investment, growth, and prosperity. Growth in construction jobs was generally higher in fast-lane economies. In China, India, and Vietnam, the share of workers in construction increased by five to 12 percentage points.

[55] *Outperformers: High-growth emerging economies and the companies that propel them*, McKinsey Global Institute, September 2018.
[56] *A tale of two Mexicos: Growth and prosperity in a two-speed economy*, McKinsey Global Institute, March 2014; and Franziska Ohnsorge and Shu Yu, eds., *The long shadow of informality: Challenges and policies*, World Bank, 2022.
[57] Admasu Shiferaw, *Productive capacity and economic growth in Ethiopia*, CDP Background Paper number 34, UN Department of Economic and Social Affairs, April 2017; and Investment and Capital Stock Dataset (ICSD), IMF, 2021.
[58] Loren Brandt et al., *China's productivity slowdown and future growth potential*, World Bank policy research working paper number 9298, June 2020. Investment in China was so rapid, for instance, that the stock of non-building structures, at 0.9 times GDP, was about 80 percent higher in 2021 relative to GDP than the average for the United States and Europe, justifiable only in support of very rapid growth expectations.
[59] *Reimagining economic growth in Africa: Turning diversity into opportunity*, McKinsey Global Institute, June 2023.
[60] See, for example, Somik Lall et al., *Pancakes to pyramids: City form to promote sustainable growth*, World Bank, June 2021. The authors argue that some cities grow as "pyramids" (tall and agglomerated) and others as "pancakes" (flat and sprawling). Pyramids are generally better at growing productivity and driving prosperity while ensuring livability and respecting planetary boundaries. Pancakes are less efficient at achieving those goals and, for example, more prone to the emergence of slums. According to the latest UN data, the proportion of urban populations living in slums in Sub-Saharan Africa has been falling in the past two decades but in 2020 still stood at 50 percent.

Exhibit 15

As emerging economies urbanized, their workforces moved away from agriculture.

Share of urban population by region, %, simple average, 1997–2022



Note: N=118 economies.
Source: World Bank; GGDC Economic Transformation Database; EU KLEMS, 2023 release, growth accounts and national accounts; McKinsey Global Institute analysis

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Well-managed cities have all the ingredients to activate the virtuous cycle of rising productivity, income, and demand. As workers move to cities and secure better, more productive jobs, they earn the higher wages that boost both savings and consumption. Higher consumption gives business the incentive to invest, and savings fund the investment—which, in turn, makes workers more productive, restarting the cycle.

Across our sample of 54 economies, an average of roughly one-sixth of the workforce left agriculture from 1997 to 2018. In China, agriculture fell from 50 to 27 percent of the workforce, with 150 million people leaving the sector.[61] Vietnam's share dropped from 70 to 38 percent, and Romania halved its share, from 40 to 19 percent.

[61] In some economies, the absolute value of workers in agriculture grew, but at a slower pace than in other sectors, resulting in a significant decrease in agriculture employment share across all sample economies. That was accompanied by growing total real value added in agriculture in all our sample economies, except for Poland, where it slightly decreased.

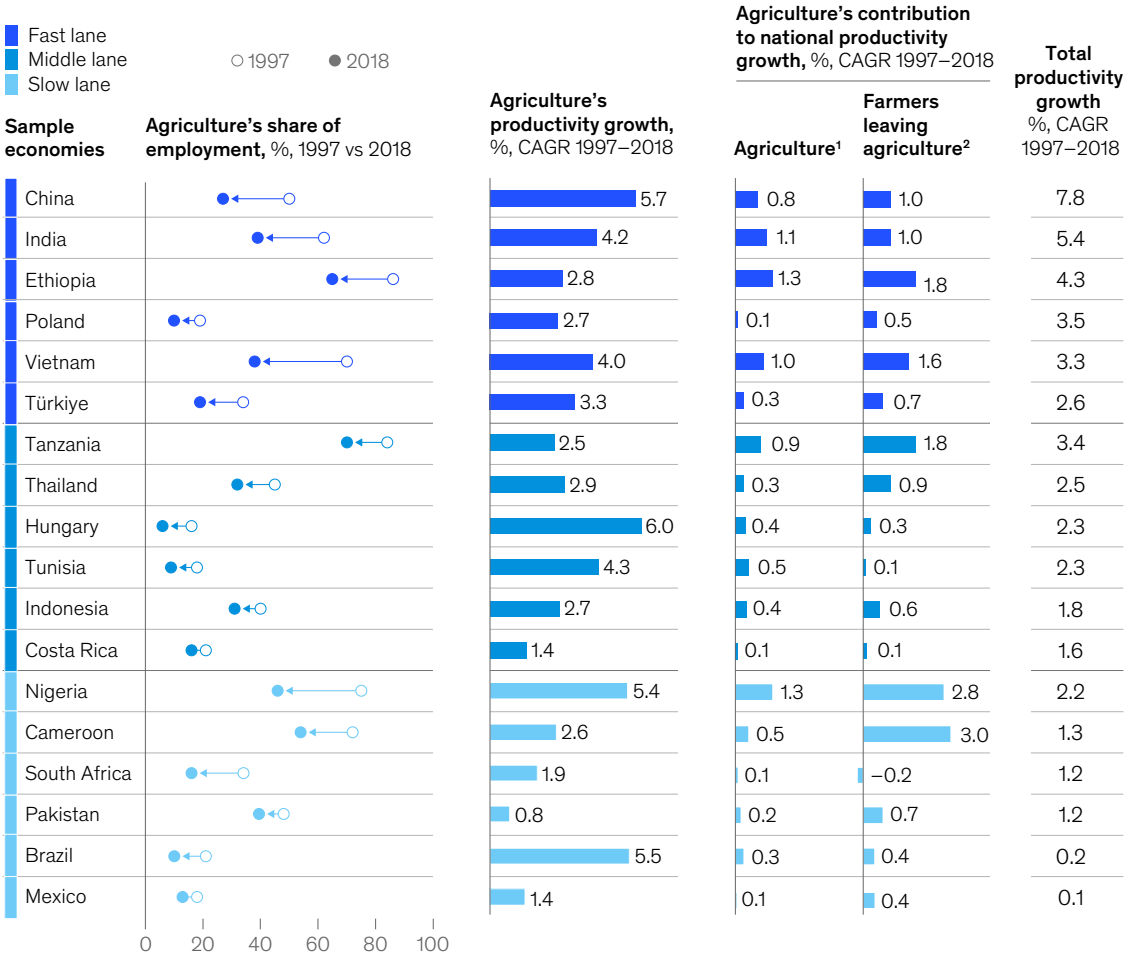
Urbanization's productivity boost in emerging economies is due both to workers leaving the low-productivity agriculture sector (the mix effect) and to better performance in the agriculture sector itself (the within effect) as it mechanized or lost redundant labor (Exhibit 16). In fast-lane economies, agriculture contributed to roughly one-third of all productivity growth from 1997 to 2018. In these economies, across regions, the employment share and often even total employment in agriculture decreased, yet total output nearly doubled.

In emerging economies where urbanization started earlier, the productivity impact of agriculture was understandably lower. In 1997, Central and Eastern European economies had a relatively small

Exhibit 16

Improvements within agriculture and shifting employment away from it have had a significant impact on economy-wide productivity growth.

Productivity growth per employee,
GVA at constant 2015 prices (local currency) per person employed, %



[1]Within effect of agriculture to total productivity growth (excluding real estate).
[2]Mix effect of all sectors. Most of the effect comes from agriculture, but the numbers shown include the impact of labor relocation across all sectors.
Note: N=18, sample of economies. Small differences in per-economy productivity growth vs earlier exhibits looking at a larger set of economies due to different data sets used. Numbers may not sum due to rounding.
Source: GGDC Economic Transformation Database; for Poland and Hungary, EU KLEMS, 2023 release, growth accounts and national accounts; McKinsey Global Institute analysis

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17 percent share of workers in agriculture, on average, and Latin American economies 23 percent. The sector contributed about or less than half a percentage point to total productivity growth.

Growing service-sector jobs have distinctively high productivity growth in fast-lane economies

Across lanes, most of the workers leaving agriculture entered services. But fast-lane economies invested to enhance the productivity of these service sectors even as they industrialized.

One central tenet of development economics is that industrialization is the main way to boost productivity growth; by contrast, increasing service-sector productivity is hard.[62] While manufacturing is still extremely relevant, we find that many fast-lane economies achieved notably high productivity growth in services, too.

Reallocating workers toward services in itself does not always translate into a large productivity boost. In fact, in most cases, more than 60 percent of the workers who entered services went into relatively low-productivity subsectors such as wholesale and retail trade or transportation.[63] For example, while 15 percent of China's workforce entered services between 1997 and 2018, that added only 0.2 percentage point to productivity growth, as about 80 percent of the workers joined low-productivity services.

What matters to the success of fast-lane economies is the push to raise productivity within services (Exhibit 17). This includes gains in the lower-productivity service sectors mentioned above (such as the spread of modern-format stores in retail) as well as in higher-productivity sectors such as business and financial services.

A substantial share of fast-lane productivity gains was likely due to investment in physical and human capital. India's early upgrading of digital infrastructure and workforce skills in the 1990s enabled it to become a global IT leader, especially in software, for example.[64] Other types of infrastructure, such as transport services, matter as well. Central and Eastern European economies raised productivity in services markedly due in no small part to their ability to attract significant foreign direct investment.[65]

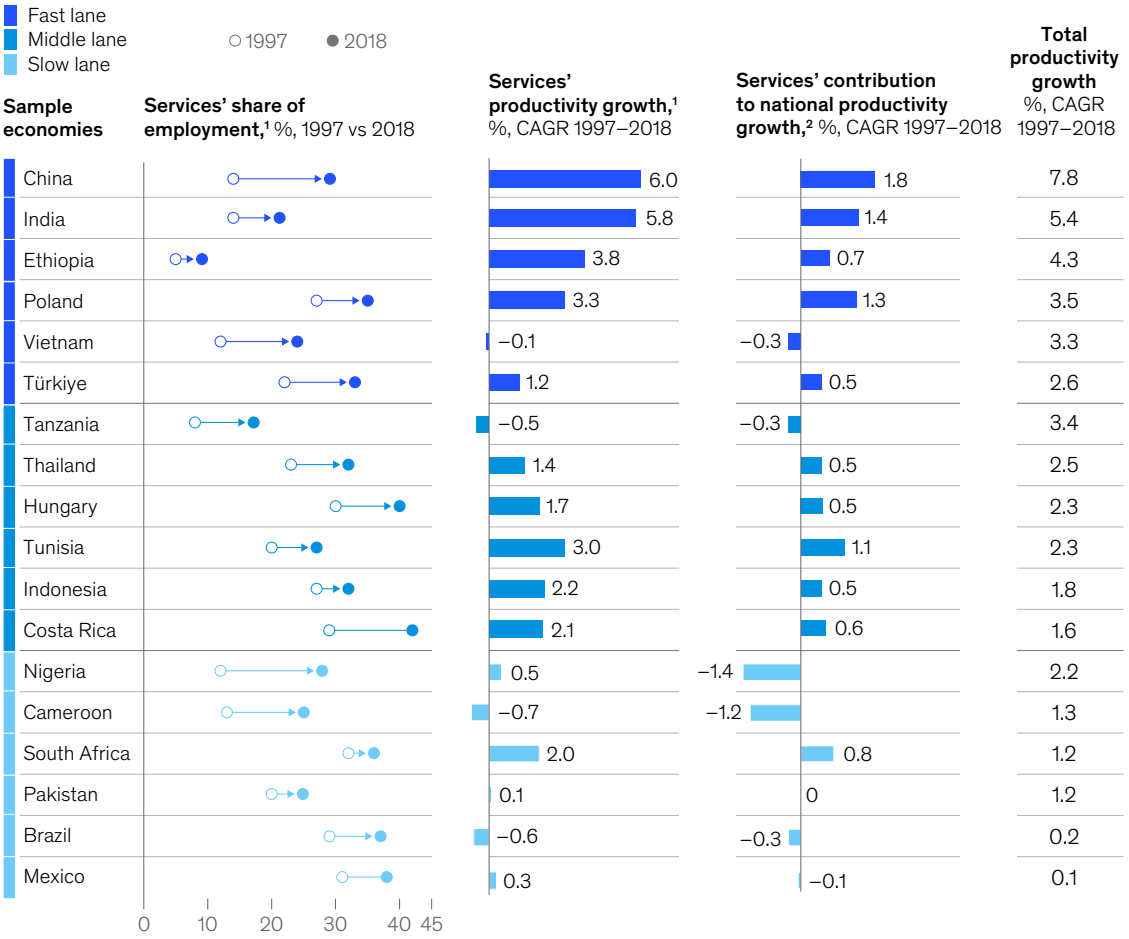
What matters to the success of fast-lane economies is the push to raise productivity within services.

[62] Joe Studwell, *How Asia works: Success and failure in the world's most dynamic region*, Grove Press, 2014.
[63] Since these services generally had productivity levels similar to average economy productivity, this shift alone did not result in high productivity growth at first.
[64] Bart van Ark, Klaas de Vries, and Dirk Pilaty, *Are pro-productivity policies fit for purpose? Productivity drivers and policies in G-20 economies*, The Productivity Institute, September 2023.
[65] *A new dawn: Reigniting growth in Central and Eastern Europe*, McKinsey Global Institute, December 2013.

Exhibit 17

Fast-lane economies achieved distinctively high productivity growth in services as those sectors expanded.

Productivity growth per employee,
GVA at constant 2015 prices (local currency) per person employed, %



[1]Services include trade services, transport services, business services, and financial services.
[2]Within effect of trade services, transport services, business services, and financial services to total productivity growth (excluding real estate).
Note: N=18, sample of economies. Small differences in per-economy productivity growth vs earlier exhibits looking at a larger set of economies due to different data sets used.
Source: GGDC Economic Transformation Database; for Poland and Hungary, EU KLEMS, 2023 release, growth accounts and national accounts; McKinsey Global Institute analysis

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In fast-lane economies, manufacturing sectors have become more sophisticated and global

Fast-lane economies of different income levels were able to outpace other emerging economies in the race to industrialize. They raised growth in manufacturing productivity—and output—largely through building more complex supply chains, producing more sophisticated products, and plugging into global value chains.

Whether economies can still industrialize their way to prosperity, as some East Asian economies did in the past, is an ongoing and lively debate in development economics.[66] Our findings suggest

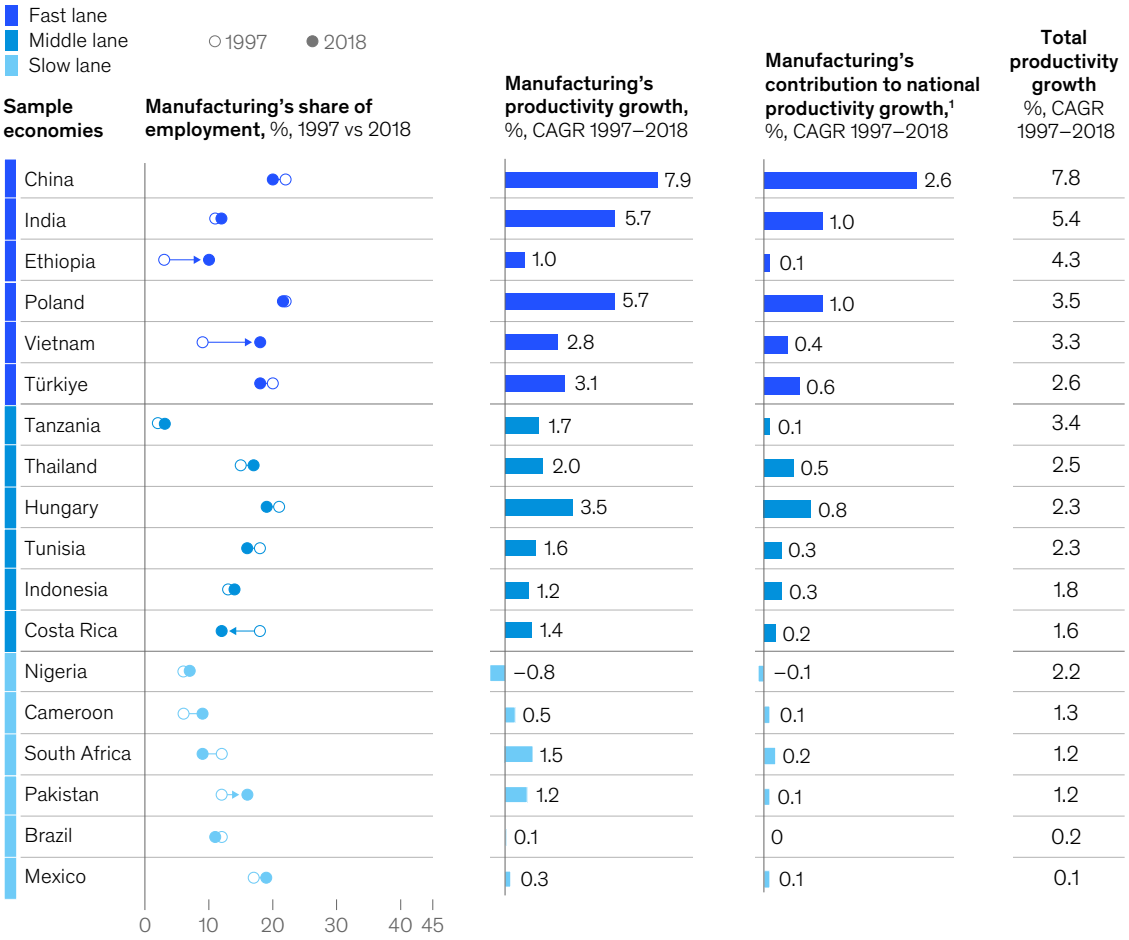
[66]See, for example, Dani Rodrik and Joseph E. Stiglitz, *A new growth strategy for developing nations*, Harvard University, January 2024.

that manufacturing, including via exports, has continued to be a common way for emerging economies to raise productivity, despite only rare instances in the past quarter century in which the sector significantly expanded employment. In contrast to services, the share of manufacturing jobs in fast-lane economies, except for a few that started from a very low base, either stayed flat or fell (Exhibit 18).[67]

Exhibit 18

As their manufacturing sectors became more sophisticated and global, fast-lane economies achieved fast productivity growth with similar employment.

Productivity growth per employee,
GVA at constant 2015 prices (local currency) per person employed, %



[1]Within effect of manufacturing to total productivity growth (excluding real estate).
Note: N=18, sample of economies. Small differences in per-economy productivity growth vs earlier exhibits looking at a larger set of economies due to different data sets used. Numbers may not sum due to rounding.
Source: GGDC Economic Transformation Database; for Poland and Hungary, EU KLEMS, 2023 release, growth accounts and national accounts; McKinsey Global Institute analysis

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[67] A common error is to conflate manufacturing with industry. The share of industrial employment did indeed grow in China in the past 25 years, which some may interpret as manufacturing growth. The reality is that the growth of Chinese industrial employment was almost entirely driven by the construction sector, not by manufacturing.

In China, manufacturing was the single most important driver of productivity, adding 2.6 percentage points in annual growth. Manufacturing also contributed strongly to productivity growth in fast-lane Central and Eastern European economies such as Romania (1.4 percentage points), Slovakia (1.4 points), and Poland (1.0 point).

These gains were achieved, in many cases, once economies already had a relatively large manufacturing sector (about 20 percent of total employment), without increasing the sector's share of employment. In fact, in three of the six fast-lane economies in our sample, the sector's share of workers actually fell or held steady: China went from 22 to 20 percent, Türkiye dropped from 20 to 18 percent, and Poland stayed at 22 percent.[68] India experienced very limited growth in manufacturing's share of employment, starting from a low base. Only Ethiopia and Vietnam, starting even lower, managed to grow their manufacturing employment substantially.

Manufacturing provides a channel for the kind of investment in R&D and innovation that helps drive overall productivity growth; trade in manufactured goods within a global value chain accelerates that growth. A strong manufacturing sector also enables economies to produce the basic materials and capital goods they need for urbanization, infrastructure, and mechanization in other sectors. Fast-lane economies pursued each of these factors more than those in the slower lanes; many of the latter relied more on commodity exports.

R&D-rich, globally integrated manufacturing supports the evolution to a more diversified and sophisticated economic fabric. Indeed, fast-lane countries have above-average economic complexity, a measure of the diversity and sophistication of the products that an economy is capable of producing. This capability is an indication of a country's economic development and competitiveness.[69] China has increased its economic complexity toward advanced-economy levels (Exhibit 19).

Trade in manufactured goods amplifies the productivity dividend, especially when it is part of a global value chain. Trading firms learn faster and are more competitive at home and abroad.[70] When they are part of a global value chain, companies are also able to specialize in core tasks and access inputs and knowledge from their foreign partners. Greater exports are also an important source of demand, providing economies with the incentives and revenues to invest in capital goods and technology.

Where fast-lane economies benefit from economic complexity and trade, slow-lane economies may suffer from excessive reliance on resources. On average, 78 percent of the goods exported by slow-lane economies are commodities, about double the share in fast-lane economies and advanced economies.[71] This dependence makes economies more vulnerable to global shocks and impedes their industry-driven productivity growth.[72] High-value commodity exports also put upward pressure on the exchange rate, making exports less competitive. This, in turn, discourages investment in tradable sectors and accelerates the growth of nontradable services.[73]

[68] These peak values are consistent with the premature deindustrialization theory, which holds that manufacturing employment starts to peak earlier after the 1990s, and with a maximum close to 20 percent. See Dani Rodrik, *Premature deindustrialization*, November 2015.

[69] The Atlas of Economic Complexity, Harvard Kennedy School Growth Lab, accessed February 19, 2024; and Ricardo Hausmann, "Economic complexity," accessed February 19, 2024.

[70] Cristina Constantinescu, Aaditya Mattoo, and Michele Ruta, "Does vertical specialisation increase productivity?," *The World Economy*, volume 42, number 8, August 2019.

[71] When 60 percent or more of an economy's merchandise export revenue comes from commodities, it is considered "commodity-dependent," as defined by UNCTAD. Note that other than having a lower average percentage of commodities as exports, advanced economies often have a higher absolute value of commodity exports. *Commodities and development report 2023*, UNCTAD, October 2023.

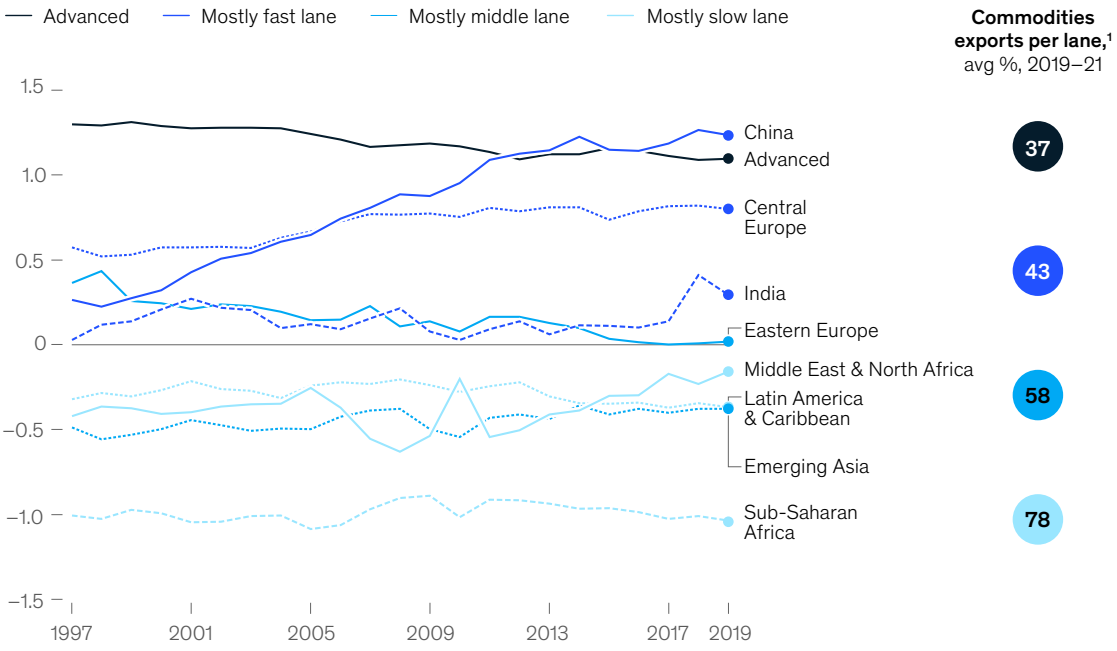
[72] Stefan Csordás, *Commodity dependence, productivity and structural change*, UNCTAD, June 2021.

[73] Alistair Dieppe, ed., *Global productivity: Trends, drivers, and policies*, World Bank, 2019.

Exhibit 19

Fast-lane economies export more complex products and are less dependent on the export of commodities.

Economic Complexity Index over time per region and lane
Number of standard deviations away from the global mean, 1997–2019



[1]Per-lane simple average percentage of goods exports that stem from commodities, including mining, energy, and agriculture. As defined by UNCTAD, when 60% or more of an economy's merchandise export revenue comes from these raw materials, it is deemed "commodity-dependent." N=106, all economies with data availability.
Note: N=117 economies.
Source: Harvard Atlas of Economic Complexity; UNCTAD; McKinsey Global Institute analysis

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Solid and improving enablers pave the way to the fast lane

Strong investment and productivity growth can only be built on a firm foundation. Knowing the necessary conditions for economic development and growth is the holy grail of economics. The drivers are many, and the circumstances and extent to which they drive productivity growth are hotly debated. Some research institutions have built lists of productivity drivers, including the World Economic Forum's Global Competitiveness Index of 12 drivers and the World Bank's 2019 Global Productivity framework of ten.[74] There is also a question about whether it takes a certain level of each enabler to achieve a large acceleration in productivity or whether improvements in each driver are enough. The answer is probably a combination. In this section, we focus on three enablers: institutions, innovation (through R&D), and human capital.

Effective institutions are fundamental to long-run growth, through both effective public intervention and creating the rules of the game in which businesses invest and thrive. From the

[74] The World Economic Forum's index consists of 12 pillars, including institutions, human capital (skills), and innovation, among others. The World Bank's drivers are demography, investment, geography, gender equality, trade, education, urbanization, economic complexity, institutions, and innovations. *The global competitiveness report 2019*, World Economic Forum, 2019; and Alistair Dieppe, ed., *Global productivity: Trends, drivers, and policies*, World Bank, 2019.

vast literature on institutions and productivity growth,[75] we have selected pillar 1 from the World Economic Forum's Global Competitiveness Index to analyze our lanes. This pillar, measuring the relative strength of institutions, includes metrics for government performance, property rights, transparency, security, and a lack of corruption, among other things.[76] On a scale from 0 (worst) to 100 (best), the average score of advanced economies is 71. Fast-lane economies have an average of 56, middle-lane economies 52, and slow-lane economies 48.

Investment in R&D is a simple proxy for an economy's capacity to innovate. Fast-lane economies invest on average nearly 1 percent of their GDP in R&D, compared with 0.6 percent and 0.4 percent by middle- and slow-lane economies.[77] China has dramatically increased investment in R&D, from 0.6 percent of GDP in 1997 to 2.2 percent in 2019, matching the advanced-economy average for that year. Economies in Central Europe lifted their R&D investment from 0.6 percent to 1.0 percent over that quarter century. Economies in Latin America, many of which are in the slow lane, invest only 0.2 percent of GDP in R&D. The region accounts for less than 2 percent of the world's patent applications, and of these, less than one-fifth are filed by Latin Americans.[78]

The third enabler we examined is education, or productive investment in human capital.[79] Ample literature supports the relevance of human capital as a driver of economic development.[80] A simple measure of education is learning-adjusted years of schooling in the working population. Advanced economies average about 11.0 years, fast-lane economies 9.0 years, middle-lane economies 7.5 years, and slow-lane economies 6.0 years.

Regions with an overrepresentation of slow-lane economies are significantly weaker when it comes to these enablers. For example, Latin America's growth has long been held back by underdeveloped financial sectors and certain regulations that block investment. Weak public institutions and governance also limit government capacity to reduce the region's considerable gaps in human capital, technology, and infrastructure.[81]

Similar factors affect economies in Sub-Saharan Africa, despite significant differences in income levels. Political instability can add to this story. Previous MGI work found that coups and other political events affected 30 percent of Africa's population in the 2010s, compared with 4 percent in the 2000s.[82] After peaking in 2008, foreign direct investment flows into Africa declined in 31 of Africa's 54 economies, falling fastest in the continent's two largest economies, Nigeria and South Africa.

Strong and improving foundations in institutions, education, and innovation are three of the most relevant enablers of productivity growth. They require—and also unleash—the necessary investments that are critical to moving economies into the fast lane.

[75] Daron Acemoglu, Simon Johnson, and James A. Robinson, "Institutions as a fundamental cause of long-run growth," in *Handbook of Economic Growth*, volume 1A, Philippe Aghion and Steven Durlauf, eds., Elsevier, 2006; and Xavier Cirera, Roberto Fattal-Jaef, and Hibret Maemir, "Taxing the good? Distortions, misallocation, and productivity in Sub-Saharan Africa," *The World Bank Economic Review*, volume 34, number 1, February 2020.

[76] "Pillar 1: Institutions," in *The global competitiveness report 2019*, World Economic Forum, 2019.

[77] World Development Indicators, World Bank, 2023.

[78] "What could a new era mean for Latin America?," McKinsey Global Institute, July 2023. Note that the investment in R&D over GDP quoted on this article is close but slightly different, at 0.6 percent. The discrepancy stems from some small differences in the economy set used.

[79] The investment rates and capital stock figures this section relies on do not capture investment in education, despite its importance. "Expected years of school" is calculated as the sum of age-specific enrollment rates between ages four and 17. Age-specific enrollment rates are approximated using school enrollment rates at different levels: pre-primary enrollment rates approximate the age-specific enrollment rates for four- and five-year-olds; the primary rate approximates for six- to 11-year-olds; the lower-secondary rate approximates for 12- to 14-year-olds; and the upper-secondary approximates for 15- to 17-year-olds. Human Capital Index, World Bank, 2020.

[80] Edward L. Glaeser et al., "Do institutions cause growth?," *Journal of Economic Growth*, volume 9, number 3, September 2044; *Value for money in school education: Smart investments, quality outcomes, equal opportunities*, OECD, November 2022.

[81] See, for example, *The politics of institutional weakness in Latin America*, Daniel Brinks, Steven Levitsky, and María Victoria Murillo, eds., Cambridge University Press, 2020; Shannon K. O'Neil, "Why Latin America lost at globalization—and how it can win now," *Americas Quarterly*, July 2022; Peter Coy, "The four 'syndromes' behind Latin America's economic stagnation," *New York Times*, September 25, 2023; Jorge Thompson Araujo et al., *Understanding the income and efficiency gap in Latin America and the Caribbean*, World Bank, 2016; and *Where will Latin America's growth come from?* McKinsey Global Institute, April 2017.

[82] Includes African economies in the Middle East and North Africa region. *Reimagining economic growth in Africa: Turning diversity into opportunity*, McKinsey Global Institute, June 2023.

4. An agenda for productivity growth in a changing geo-economic era

Our diagnosis suggests priorities for advanced economies: a focus on revamping investment and harvesting the productivity dividend from digital and other technologies such as AI. Conversely, commonly raised solutions such as reshoring manufacturing and trying to influence the sector mix are less likely to reaccelerate productivity growth. Improving how we measure GDP and productivity is a worthwhile pursuit, but the drivers of the slowdown outlined in this research have been real and keenly felt regardless of measurement.

We also outline the priorities for emerging economies to get to the fast lane: boost capital investment, build on that investment to urbanize effectively, grow the productivity and size of the service and construction sectors, and increase the sophistication and global interconnectedness of manufacturing.

In this last section, we explore the future of productivity growth by posing seven questions. Because we cover the full range of global economies with different characteristics, we necessarily focus on general points. The first two questions—linked to investment and technology—focus on what is needed to reverse the slowdown and position economies for high productivity growth in a changing era. The final five explore how future productivity growth will be shaped by the big puzzles on the horizon: shrinking and aging populations in many economies, including most advanced economies and China; new ways of working; the growing importance of services; trade tensions and supply-chain disruptions; and energy costs.

1. Can we revamp investment and demand in a changing macro environment?

If there is a common thread in this report, it is the importance of investment. Fully half of the drop-off in productivity growth in advanced economies is a slowdown in capital deepening (that is, the growth of capital per worker). High capital deepening is also the key characteristic of emerging economies in the fast lane.

Investment flows best in "high-pressure" economies that enjoy strong demand, strong growth, and low unemployment. Inflationary pressure and rising interest rates could be signs that we are leaving behind secular stagnation and entering an era of higher demand and investment. Higher real wages may motivate more capital investment, too.[83] Although it is too soon to tell, some signs appear positive, particularly in the United States. Real GDP beat expectations by growing at annualized rates of 4.9 and 3.3 percent in the third and fourth quarters of 2023, respectively; this was largely driven by equally high productivity growth.[84] Aggregate metrics show that investment

[83] *The future of wealth and growth hangs in the balance*, McKinsey Global Institute, May 2023.
[84] See "Gross domestic product, fourth quarter and year 2023 (advance estimate)," US Bureau of Economic Analysis, January 2024; and "Major sector productivity and costs: Nonfarm business, labor productivity (output per hour)," US Bureau of Labor Statistics, February 2024.

is up from pandemic lows, though it still has a long way to go. Anecdotally, the big five US tech firms spent $350 billion among them on R&D and capital expenditures in 2022, as part of a race for supremacy in AI and the cloud.[85] Construction activity in the US manufacturing sector is two to three times its normal level, driven in part by a rush to build battery supply chains.[86]

Advanced economies might also tilt regulatory conditions in favor of investment and innovation. Priorities would include reducing unwarranted burden and complexity (for example, for permits to build renewable power), more effective market regulation, fixing land markets to facilitate building, and better intellectual property and competition policies. Creating the right balance of competition and entrepreneurship would motivate new waves of investment. In the United States, business dynamism shot up in 2020 and kept pace through 2023.[87]

Emerging economies would benefit from public and private investment in urban infrastructure and in the public services and worker skills that make cities function. While people moving from farms to cities is a major lever for productivity growth, it can result in "sterile agglomeration" without the right hard and soft investments.[88] The focus can also extend to secondary cities with large potential.[89] This requires creating savings or borrowing power to unleash that investment. However, emerging economies may find funding hard to come by. In the aftermath of the COVID-19 crisis, growing debt distress could be a limitation, and investors may be more attracted to the higher interest rates available again in advanced economies.[90]

An attractive business environment therefore becomes even more important. This includes low corruption, nimble regulation, high-quality financial markets, and macroeconomic stability, all of which have proved to be persistent challenges in many parts of the world. Solving these issues would not only help attract foreign capital but also activate the virtuous cycle of rising productivity, incomes, demand, and domestic savings. Greater investment in a more favorable business environment would help businesses grow, allowing them in turn to invest in productive capital, hire and develop talent, pay higher wages, and compete in international markets. Developing large leading firms while keeping up competitive pressure would be a major spur of productivity growth in emerging economies.

2. Can we harness the promise of technology for a more productive future?

Productivity tends to accelerate in waves. As mentioned, digitization and other technological advances could add 0.5 to 1.0 percentage point to annual productivity growth in advanced economies.[91] Early adoption of recent advances such as generative AI could add an extra boost of more than 0.5 percentage point across advanced (and several emerging) economies by transforming how jobs are done.[92]

[85] McKinsey Analytics.
[86] "Construction spending—data," US Census Bureau, February 2024.
[87] "New business surge: Unveiling the business application boom through an analysis of administrative data," The White House, January 2024.
[88] Arti Grover, Somik V. Lall, and William F. Maloney, *Place, productivity, and prosperity: Spatially targeted policies for regional development*, World Bank, January 2022.
[89] *Reimagining economic growth in Africa: Turning diversity into opportunity*, McKinsey Global Institute, June 2023.
[90] M. Ayhan Kose et al., *Caught by a cresting debt wave*, International Monetary Fund, June 2020.
[91] *Will productivity and growth return after the COVID-19 crisis?* McKinsey Global Institute, March 2021.
[92] *The economic potential of generative AI: The next productivity frontier*, McKinsey & Company, June 2023.

Digitization has been the main promise for a productivity boost over the past decade, but its benefits will materialize beyond the ICT sector only with faster creative destruction, market share shifts, and the adoption of technologies, ideas, and best practices. Several AI applications hold significant productivity potential, and there are signs that they could expand faster than previous technologies.[93] While the direction and impact of AI are uncertain (and big claims about any new technological solution are often overblown), several proven productivity-enhancing use cases have already emerged.[94]

In emerging economies, wider adoption of existing technologies—for example, smartphones—rather than frontier innovation can go even further in boosting productivity, but sometimes this process takes time and must overcome barriers. For instance, Latin America has generally been a latecomer to technologies. But the pandemic boosted the adoption of technology such as digital payments and e-commerce, which could trigger catch-up growth. Yet as frontier technologies such as AI take off, the region risks lagging once again: estimates suggest that AI's impact on Latin America's economy will be three to five times lower than in North America and China.[95] Opportunities in digital technology adoption abound in Africa, too. Simpler, nondigital technologies can also significantly boost productivity. Further irrigation and fertilizer investment, for example, promise much for Africa's agricultural sectors.[96]

3. Can we reshape the effects of aging on productivity?

Demographics will continue to affect both the supply side (worker availability and individual productivity) and demand side (consumer spend) of the economy, and hence aggregate productivity. While there is no consensus in the literature, studies suggest that young workers get more productive as they grow older and then decline in productivity as they near retirement, with the turning point varying between sectors. Simply, it is not good to be too young, because workers lack the learning effects that come with experience, but it is also not good to be too old, because many occupations show productivity peaking at midlife. Estimates based on econometric studies are associated with some difficulties, and the ranges found are large (from a positive impact of aging on productivity growth to a 0.5-percentage-point productivity drag per year, depending on the economy and the time period).[97]

Globally, the number of working-age people per person over 65 will shrink from 6.6 in 2022 to 3.8 in 2050.[98] Advanced economies and China, in particular, are now in a synchronized march into

[93] Martin Neil Baily, Erik Brynjolfsson, and Anton Korinek, *Machines of mind: The case for an AI-powered productivity boom*, Brookings Institution, May 2023.
[94] *The economic potential of generative AI: The next productivity frontier*, McKinsey & Company, June 2023.
[95] "What could a new era mean for Latin America?," McKinsey Global Institute, July 2023.
[96] Daria Mashnik et al., "Increasing productivity through irrigation: Problems and solutions implemented in Africa and Asia," *Sustainable Energy Technologies and Assessments*, volume 22, August 2017; *Improving delivery of seed and soil fertility technologies in Ethiopia, Malawi, and Mozambique: Linking research outputs to smallholder farmers: A partnership journey with International Fund for Agricultural Development*, Alliance for a Green Revolution in Africa, April 2023.
[97] Shekhar Aiyar, Christian Ebeke, and Xiaobo Shao, *The impact of workforce aging on European productivity*, IMF working paper WP/16/238, December 2016; Nicole Maestas, Kathleen J. Mullen, and David Powell, "The effect of population aging on economic growth, the labor force, and productivity," *American Economic Journal: Macroeconomics*, volume 15, number 2, April 2023; and James Feyrer, "Demographics and productivity," *The Review of Economics and Statistics*, volume 89, number 1, 2007.
[98] United Nations, Department of Economic and Social Affairs, Population Division, *World population prospects 2022*, online edition.

aging.[99] This is a risk to productivity growth unless businesses and policy makers work toward mitigating or turning around the effects of aging through reskilling, rethinking retirement policies, and other means. They might also target the growing "silver economy" of older consumers, creating new markets with more and better products and services.

Emerging economies with young and fast-growing workforces hold a great asset. Their talent has the potential not only to increase domestic productivity but also to support aging populations elsewhere. Africa, home of the world's youngest and fastest-growing population, will add almost 800 million people to its working population by 2050, overtaking China and India.[100]

4. Can we make hybrid work work?

During the pandemic, people worked from home in significant numbers perhaps for the first time, and part of this shift has stuck. The long-run productivity impact of hybrid work is yet to be seen, although it could be positive if properly structured and managed.

Research shows that the effects of remote work are very sensitive to industry, role, and activity. For fully remote work, most studies show a loss in productivity per hour, which can be offset by more hours worked as commuting time is saved. Hybrid arrangements do tend to increase productivity if staged and managed properly, most studies show. On the one hand, early-stage innovation and brainstorming benefit from on-site exchange, as do training and mentoring, particularly for new employees. On the other hand, working remotely some days has a number of advantages: it promotes cross-office and cross-country connectivity; it can make happier workers put in greater effort; it allows for a quieter home environment for certain tasks; and it saves time through less commuting, shorter breaks, and less sick leave.[101]

In addition, remote work opens the option of completely outsourcing jobs to emerging economies, especially in services, which may drive a new wave of offshoring for economies with the right talent and infrastructure in place.

5. Can we drive productivity in services?

For someone who has time traveled from the 1960s, our phone calls and computers, and how we build them, have changed beyond recognition. Yet a haircut or going to a hotel or a restaurant would be very familiar. While some specific service subsectors (financial services, professional services, and ICT) have shown higher productivity and productivity growth than manufacturing, services tend to be harder to transform and can be a drag on an economy's productivity growth.

Increasing productivity in services is a major puzzle. Economies are becoming more and more service intensive, not least because manufacturing involves fewer jobs as it becomes more productive. As we have established, the mix effect in some advanced economies has exerted a constant small drag on productivity growth. (See sidebar "A detailed economy-sector view of the productivity slowdown and the mix effect" in section 2.) Advanced economies have been

[99] In Japan and the United States, for example, the number of retirees will keep growing over the next few decades, even though growth in the share of the total population aged over 60 has already peaked. China is heading in the direction of South Korea, and its trajectory is steeper than that of Japan in the past. Hannah Ritchie et al., "Population growth," Our World in Data, accessed February 19, 2024; Jacob Funk Kirkegaard, "China's population decline is getting close to irreversible," Peterson Institute for International Economics, January 2024.

[100] *Reimagining economic growth in Africa: Turning diversity into opportunity*, McKinsey Global Institute, June 2023.

[101] José Maria Barrero, Nicholas Bloom, and Steven J. Davis, "The evolution of work from home," *Journal of Economic Perspectives*, volume 37, number 4, Fall 2023.

reweighting toward services for decades, and this trend is now apparent in most emerging economies, too.

In any case, it is challenging for economies to influence their sector mix. Sector specialization depends on deep economic forces that are not simple to modify, and, more important, sector growth rates reflect changes in consumption patterns. This is why making services more productive is a more reliable and sustainable way to raise the aggregate productivity of the economy than other approaches.

For slow-growing emerging economies, solving this puzzle may be even more crucial. Even if opportunities exist, not every economy will be able to secure a manufacturing role in global supply chains to employ 15 or 20 percent of the population, especially as manufacturing becomes more automated. While manufacturing will remain an important source of productivity growth, services (both domestic and for export) will be crucial—probably increasingly so. Following the model of India, the mass export of digital and other services may be an option for several economies, both to increase overall productivity and to reduce dependence on volatile commodity exports.

6. Can we maintain high global cooperation?

The integration of global value chains unlocked huge productivity gains, both in the OECD and where new manufacturing capabilities were built. And while markers of global integration for physical goods plateaued in the years following the GFC, flows of services, data, and people have been steadily increasing. However, the pandemic interrupted global cooperation, which continues to be shaken by trade tensions, protectionist policies, wars, and other geopolitical events.[102] If globalization recedes, it could hamper productivity growth in both advanced and emerging economies.

How global supply chains will reconfigure in the future is uncertain, and the shape of this reconfiguration will matter for productivity growth. If trade fragments along geopolitical lines, the impact on global growth may be substantial; some economies could lose up to 6 percent of GDP due to trade effects alone.[103] The long-term impact on productivity growth could be more substantial if we also consider barriers to cross-border investment and reduced diffusion of ideas and technology across the globe.[104] Meanwhile, there are indications that some emerging economies are beginning to assume larger roles in global trade networks. Annual greenfield investment in Africa (mainly North Africa) and India has surged by 109 percent and 54 percent, respectively, relative to prepandemic averages. Future reconfiguration may enable a new wave of economies to move into the fast lane, shifting them from commodity dependence to more complex exports.

Finally, industrial policies that promote the reshoring of manufacturing in some advanced economies are on the rise but may not cause higher productivity growth.[105] It was an offshoring

[102] *Geopolitics and the geometry of global trade*, McKinsey Global Institute, January 2024; *The Global Cooperation Barometer 2024*, World Economic Forum and McKinsey & Company, January 2024.
[103] *Geopolitics and the geometry of global trade*, McKinsey Global Institute, January 2024.
[104] Shekhar Aiyar et al., *Geoeconomic fragmentation and the future of multilateralism*, IMF, January 2023; and "Geoeconomic fragmentation and foreign direct investment," in *World Economic Outlook: A rocky recovery*, IMF, April 2023.
[105] Simon Evenett et al., *The return of industrial policy in data*, IMF working paper number 2024/001, January 2024.

wave—with employment growth falling while output kept growing—that led to fast productivity growth in the late 1990s and early 2000s. Trying to recover manufacturing jobs is unlikely to help productivity, since it is precisely the less productive tasks (and hence jobs) within global value chains that are generally offshored.

7. Can we reenergize productively?

Global economies have embarked on one of the largest energy transitions in history, and it is uncertain if this will be a tailwind or a headwind for productivity. High energy intensity is key as economies industrialize. However, most advanced and several emerging economies have now decoupled their economic growth from greater energy usage.[106] Energy costs account for only about 6 percent of GDP, meaning even large swings in energy costs may have a muted impact on productivity growth.[107]

In any case, in the short run, the increasing cost of energy, materials, and other resources weighs negatively on productivity. Managing the intermittency of some renewable sources can be costly, too. Investments to speed up the transition that are not yet "in the money"—and may take years or decades to yield positive returns—do not help productivity, either.

However, investment in clean energy and innovation can spur significant productivity and efficiency increases, particularly in the longer run.[108] Productivity-enhancing benefits from energy-efficiency investments include increased output yields, shorter process cycle times, improved product quality, and improved machinery performance.[109] While intermittence is a current limitation of many clean energy sources, generation costs have already fallen substantially, and the electrification of transportation, industry, and heating could lead to higher conversion efficiency. Additional productivity spillovers may emerge. For example, building electric vehicles requires less labor than building internal-combustion-engine vehicles.[110]

The need for critical new resources can also produce regional shifts and benefit some emerging economies, if well managed. Latin America, for instance, has a unique opportunity to support global decarbonization since it holds about half of the world's lithium, 36 percent of its copper, and 16 percent of its nickel, all of which are critical for the net-zero transition.[111]

[106] Hannah Ritchie, "A number of countries have decoupled economic growth from energy use, even if we take offshored production into account," Our World in Data, November 2021.
[107] For example, see "Inflation-adjusted US energy spending increased by 25% in 2021," US Energy Information Administration, August 3, 2023.
[108] André et al. estimate that a 5 percent increase in energy prices reduces firm productivity by approximately 0.4 percent one year later. However, a shock corresponding to a 10 percent increase in energy prices is associated with an increase in productivity growth of about 0.9 percentage point four years after the shock. Christophe André et al., *Rising energy prices and productivity: Short-run pain, long-term gain?*, OECD Economics Department working paper number 1755, May 2023. See also Samuel Gamtessa and Adugna Berhanu Olani, "Energy price, energy efficiency, and capital productivity: Empirical investigations and policy implications," *Energy Economics*, volume 72, May 2018; Hodayah Finman and John A. "Skip" Laitner, "Industry, energy efficiency and productivity improvements," *Proceedings of the 2001 Summer Study on Energy Efficiency in Industry*, American Council for an Energy-Efficient Economy, 2001; and Fotios Kalantzis and Hanna Niczyporuk, "Labour productivity improvements from energy efficiency investments: The experience of European firms," *Energy*, volume 252, August 2022.
[109] Hodayah Finman and John A. "Skip" Laitner, "Industry, energy efficiency and productivity improvements," *Proceedings of the 2001 Summer Study on Energy Efficiency in Industry*, American Council for an Energy-Efficient Economy, 2001; Fotios Kalantzis and Hanna Niczyporuk, *Can European businesses achieve productivity gains from investments in energy efficiency?*, EIB working paper number 2021/07, European Investment Bank, June 2021.
[110] *Solving the productivity puzzle: The role of demand and the promise of digitization*, McKinsey Global Institute, February 2018.
[111] "What could a new era mean for Latin America?," McKinsey Global Institute, July 2023.

Productivity growth is much more than an economic concept: it is at the core of shared prosperity. Businesses and policy makers in advanced and emerging economies alike need to take action and create the conditions to boost investment, which underlies the technological, economic, and social transformations that drive productivity. This will be critical as the world wrestles with the challenges and opportunities brought by the next era.

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