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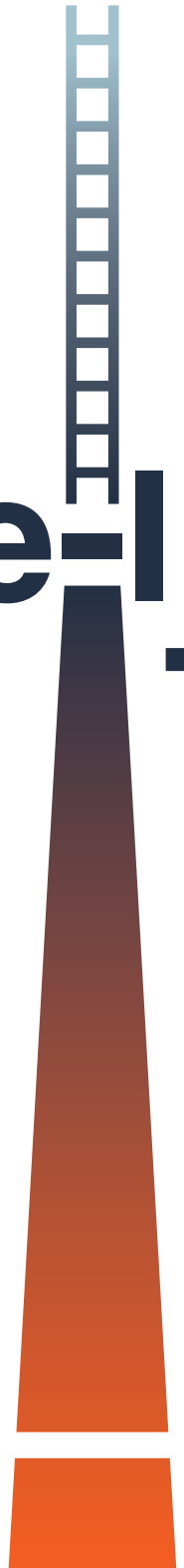
A World Bank Group Flagship Report

WORLD DEVELOPMENT REPORT 2024



The Middle-Income Trap

OVERVIEW

WORLD BANK GROUP

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The Middle-Income Trap

OVERVIEW

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Foreword

In 2007 the World Bank published *An East Asian Renaissance: Ideas for Economic Growth*—the report that coined the phrase "middle-income trap." This was during a decade of booming growth and poverty reduction in developing countries. Yet it was clear by then that many economies—particularly in Latin America and the Middle East—had remained stuck for decades, despite their efforts to rise to high-income status. "Middle-income trap" is now a popular phrase: it results in tens of thousands of Google search references. And it is frequently on the tongues of academics and politicians from developing countries—in Latin America and South Asia and just about every place in between.

A decade ago, in "The Middle-Income Trap Turns Ten," Brookings Institution economist Homi Kharas and I reviewed the burgeoning literature that *An East Asian Renaissance* had inspired. We found that economists had yet to provide a reliable theory of growth to help policy makers navigate the transition from middle- to high-income status. Some had attempted to develop models, but they were poor substitutes for a well-constructed growth framework on which policy makers could build effective development strategies. Meanwhile, the ranks of middle-income countries continued to grow. Five years later, in "Growth Strategies to Avoid the Middle-Income Trap," we proposed that Schumpeterian growth models emphasizing creative destruction and institutional change had the potential to provide the analytical foundations for a fuller understanding of middle-income economies. But to be useful they had to be made a lot more accessible to policy makers.

This is what *World Development Report 2024* sets out to do: provide a simple but reliable growth framework for avoiding or escaping the trap. It identifies lessons from more than 50 years of successes and failures among developing countries while they were climbing the income ladder. Based on these ideas and evidence, it proposes a sequenced, three-pronged approach for today's 100-odd middle-income countries: first *investment*, then *infusion* of new technology from around the world, and then *innovation*. Each shift requires a new mix of policies that, if implemented reasonably well, result in increasingly dynamic enterprises, an increasingly productive workforce, and an increasingly energy-efficient economy. It is an approach that can benefit all countries—low-, middle-, and high-income—seeking high-quality growth.

We are not naive enough to think this will be easy. Middle-income countries will have to work miracles—not only to lift themselves up to high-income status but also to shift away from carbon-intensive growth paths that will lead to environmental ruin. Income levels in Sub-Saharan Africa, where more than half the population lives in middle-income countries, are the same as they were a decade ago. Economic growth rates in middle-income countries have been falling and are expected to average just 4 percent in the 2020s, down from 5 percent in the 2010s and more than 6 percent in the 2000s.

This has implications for the whole world. Middle-income countries are home to three out of every four people—and nearly two-thirds of those who struggle in extreme poverty. They are responsible for 40 percent of the world's total economic output—and nearly two-thirds of global carbon emissions. In short, the global effort to end extreme poverty and spread prosperity and livability will largely be won or lost in these countries.

The road ahead has even stiffer challenges than those seen in the past: rapidly aging populations and burgeoning debt, fierce geopolitical and trade frictions, and the growing difficulty of speeding up economic progress without fouling the environment. Yet many middle-income countries still use a playbook from the last century, relying mainly on policies designed to expand investment. That is like driving a car just in first gear and trying to make it go faster. If they stick with the old playbook, most developing countries will lose the race to create reasonably prosperous societies by the middle of this century. At current trends, it will take China more than 10 years just to reach one-quarter of US income per capita, Indonesia nearly 70 years, and India 75 years.

The team that has written this report hopes to radically alter this arithmetic. Our hope is that *World Development Report 2024* will, in short order, make the expression "middle-income trap" completely obsolete.

Indermit Gill
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Overview: Making a Miracle

In brief

Middle-income countries are in a race against time. Since the 1990s, many of them have done well enough to escape low-income levels and eradicate extreme poverty, leading to the general perception that the last three decades have been great for development. But this is because of abysmally low expectations—remnants from a period when more than two-thirds of the world lived on less than a dollar a day. The ambition of the 108 middle-income countries with incomes per capita of between US$1,136 and US$13,845 is to reach high-income status within the next two or three decades. When assessed against this goal, the record is dismal: the total population of the 34 middle-income economies that transitioned to high-income status since 1990 is less than 250 million, the population of Pakistan.

During the last decade their prospects have worsened. With rising debt and aging populations at home, growing protectionism in advanced economies, and escalating pressures to speed up the energy transition, today's middle-income economies are growing into ever-tighter spaces. The odds that the 6 billion people in today's middle-income countries will see their countries grow to high-income status within a generation or two were never that good. Now they are decidedly daunting.

Drawing upon the development experience since the 1950s and advances in economic analysis by Schumpeterian economists, World Development Report 2024 (WDR 2024) *identifies pathways for emerging market economies to avoid what has become known and feared as the "middle-income trap." The Report points to the need for not one but two transitions during middle-income. The first is to transition from a 1*i *strategy for accelerating investment to a 2*i *strategy that emphasizes both investment and infusion in which a country brings technologies from abroad and diffuses them domestically. Governments in lower-middle-income countries must add to investment-driven strategies measures to infuse modern technologies and successful business processes from around the world into their national economies. This requires reshaping large swaths of domestic industry as global suppliers of goods and services.*

*Once a country has succeeded in doing this, it can switch to a 3*i *strategy where it increases attention to innovation. Upper-middle-income countries that have mastered infusion can complement investment and infusion with innovation—beginning not just to borrow ideas from the global frontiers of technology but also to push the frontiers outward. This requires restructuring enterprise, work, and energy use once again, with an even greater emphasis on economic freedom, social mobility, and political contestability.*

Transitions across growth strategies are not automatic. Success depends on how well societies juggle the forces of creation, preservation, and destruction. They can do this by disciplining incumbency, rewarding merit, and capitalizing on crises. Incumbents—large corporations, state-owned enterprises, and powerful citizens—can add immense value, but they can just as easily reduce it. Governments must devise mechanisms to discipline incumbents through competition regimes that encourage new entrants without either coddling small and medium-size enterprises or vilifying big corporations. Middle-income countries have smaller reservoirs of skilled talent than advanced economies and are less efficient in utilizing them, so they will have to become better at both accumulating and allocating talent. Cheap and reliable energy has been a cornerstone of rapid economic development, but prospering while keeping the planet livable will now require much more attention to energy efficiency and emissions intensity. Exigencies such as the rise of populism and climate change provide opportunities

to dismantle outdated arrangements and make room for new ones; crises are painful, but in democracies they can help forge the consensus needed for tough policy reforms.

The handful of economies that have made speedy transitions from middle- to high-income have encouraged enterprise by disciplining powerful incumbents, developed talent by rewarding merit, and capitalized on crises to alter policies and institutions that no longer suit the purposes they were designed to serve. Today's middle-income countries will have to do the same. The question is how. Given the complex problems they will have to deal with to prosper, the imperative for today's middle-income economies is surprisingly simple: they will have to become efficient—in the use of capital, labor, and energy. This is easier said than done, but advances in economic analysis during the last three decades provide useful pointers.

Readers might immediately recognize the problem with equating a country's development with its income per capita. In fact, development practitioners have been using a raft of similarly superficial indicators to assess the structural strength of an economy and its disaggregates such as industry, society, and ecology. We have become accustomed to using the size distribution of firms in an industry to measure its productive efficiency, household income distributions to assess social durability, and the distribution of energy sources to approximate ecological sustainability. But as economic structures become more complex, these measures have become increasingly inaccurate and progressively poorer guides for making policy.

WDR 2024 *is premised on the conjecture that, relative to the complexity of their economic structures, middle-income countries have more serious information deficits than either low-income countries or advanced economies. As a result, they suffer more than the others the consequences of policies predicated on superficial measures of economic efficiency, making them especially prone to premature slowdowns in development. This pathology was nicknamed the "middle-income trap" by World Bank economists, and strategies to avoid it are the subject of this Report.*

In implementing these strategies, the Report recommends against using relatively superficial measures like firm size, income inequality, and energy sources to make policy, relying instead on unconditionally reliable measures such as value added, socioeconomic mobility, and emissions intensity. The latter are more realistic metrics for policy making, but they are also more demanding. Policy makers will have to be more willing to make public sensitive data, to openly debate policy, and take any opportunity to destroy outdated arrangements. This requires information that is harder to get, but it is essential. Without it, middle-income countries will be sailing blind into ever-stormier seas.

Since the 1970s, income per capita in the median middle-income country has stayed below a tenth of the US level. Growing geopolitical, demographic, and environmental complications will make economic growth harder in the years ahead. To become advanced economies despite these headwinds, middle-income countries will have to make miracles.

'To get rich is glorious'

You are a policy maker in one of the world's 108 middle-income countries. You have learned the importance of creating a credible, solid macroeconomic foundation for private investment, domestic and foreign, supported by strong institutions and clean governance. And, like Deng Xiaoping nearly 50 years ago, quoted here, you have big plans.

If your country is China, your 14th Five-Year Plan envisions reaching the median gross domestic product (GDP) per capita of developed nations by 2035, thereby greatly expanding your middle class. If it is India, your prime minister's vision is to turn the nation into a developed economy by 2047, the centennial of independence. If it is Viet Nam, your Socio-Economic Development Strategy 2021–2030 outlines a strategy for sustained GDP per capita growth of 7 percent through this decade, with a transition to high-income status by 2045. And if it is South Africa, your 2030 National Development Plan sets a goal of raising the income per capita from US$2,800 in

2010 to US$7,000 by 2030. Other middle-income countries have similar aspirations.

If these plans succeed, your country will reach high-income status in less than one generation, or in one or two. Your firms will be earning like never before. Your people will be consuming like never before. Far fewer people will be poor, with none desperately poor. In the halls of government, these plans generate tremendous optimism.

But there is a problem.

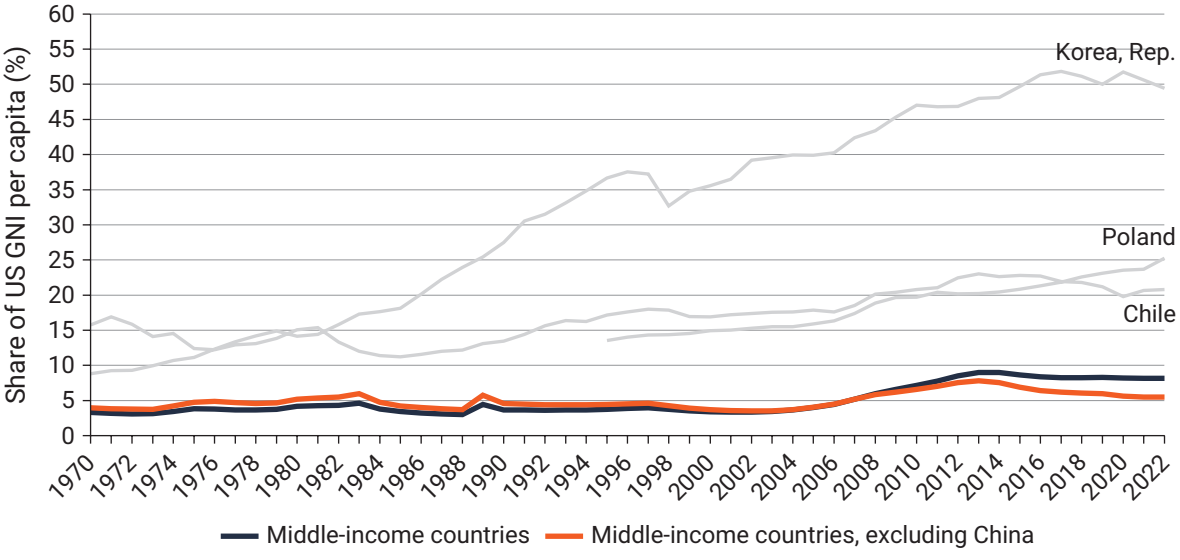
According to widely used measures such as the World Bank's World Development Indicators, you see that economic growth in middle-income countries—including your own—is *not* accelerating. If anything, it is slowing down as incomes increase—and even more so every decade.

Moreover, your country is not catching up with the income levels in advanced economies. Among those economies, the United States is still considered the world's economic leader; people living in countries with incomes higher than those of Americans add up to fewer than 25 million. Since 1970 the mean income per capita of middle-income countries has never risen above one-tenth that of the United States (figure O.1).

Compared with the United States, middle-income countries seem trapped at modest income levels.

The observed rates of economic growth in middle-income countries do not exceed those in high-income countries by the margins needed to catch up in one generation—or even two or three. Estimates using the World Bank's Long Term Growth Model, which is based on the celebrated Solow-Swan growth model, suggest that if the drivers of economic growth—investments in human capital, total factor productivity, labor force participation, and the shares of economic

Figure O.1 Income per capita of middle-income countries relative to that of the United States has been stagnant for decades



Source: WDR 2024 team using data from WDI (World Development Indicators) (Data Catalog), World Bank, Washington, DC, https://datacatalog.worldbank.org/search/dataset/0037712.

Note: The plotted lines indicate the trend of average income per capita in middle-income countries and in middle-income countries, excluding China, relative to income per capita of the United States (considered the economic frontier country). Country definitions are based on the first *World Development Report* (World Bank 1978), in which low-income countries have gross national income (GNI) per capita of US$250 or less; middle-income countries have GNI per capita of more than US$250; and industrialized (high-income) countries consist of member countries of the Organisation for Economic Co-operation and Development, except for Greece, Portugal, Spain, and Türkiye, which are classified as middle-income countries.

output devoted to public and private investment—follow recent and historic trends, most middle-income countries are likely to experience significant slowdowns between 2024 and 2100. Countries such as Brazil and Mexico are likely to be even further behind the United States in 2100 than they are today.

One trap or two?

The World Bank presently classifies 108 countries as "middle-income"—that is, those with annual income per capita ranging from US$1,136 to US$13,845.[1] These countries are critical to long-term global prosperity. They account for nearly 40 percent of global economic activity, more than 60 percent of people living in extreme poverty, and more than 60 percent of global carbon dioxide (CO_2) emissions (table O.1).

Developing economies change in structure as they increase in size, which means that changes in the pace of growth stem from factors that are new to them. Although these imperatives can vary across countries, economic expansion, on average, begins to decelerate and often reaches a plateau in income per capita growth, typically at about 11 percent of US GDP per capita. Today, this figure would be about US$8,000, or around the level at which countries are firmly considered upper-middle-income. A systematic slowdown in growth then occurs. Development strategies relying largely on capital accumulation that served these countries well in their low-income phase, for many even during their lower-middle-income phase between US$1,136 and US$4,465—begin to yield diminishing returns. Strategies based on factor accumulation alone are likely to steadily worsen results—a natural occurrence as the marginal productivity of capital declines.

To see why, consider this: if capital endowments were the only economically relevant difference between middle-income and high-income countries today, the gross national income per capita of a typical middle-income country would have been nearly three-quarters of that of the United States in 2019 (figure O.2). In fact, it is about one-fifth that of the United States. Its growth prospects now depend increasingly on its ability to boost the sophistication of its production methods.

Since 2007, the World Bank has called this dependence the "middle-income trap."[2] And over the last 34 years, only 34 economies have succeeded in breaking out of it.

To achieve high-income status, a middle-income country needs to ramp up the sophistication of its economic structure. Using the

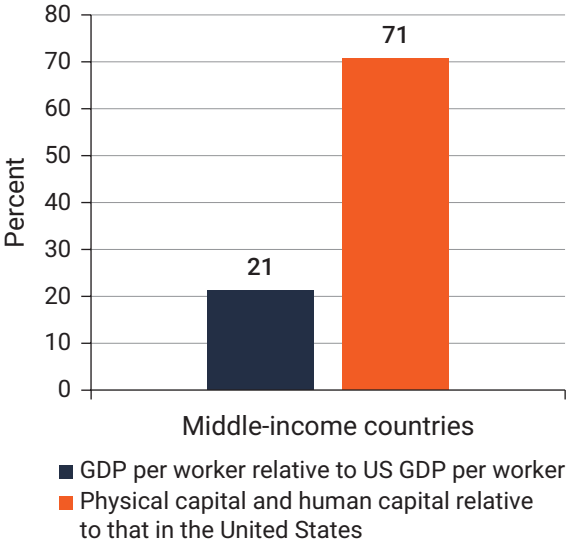
Table O.1 World Bank country classifications and selected global indicators, 2022

INCOME CLASSIFICATION	SHARE OF GLOBAL POPULATION (%)	SHARE OF GLOBAL GDP (%)	SHARE OF PEOPLE IN EXTREME POVERTY GLOBALLY (%)	SHARE OF GLOBAL CARBON DIOXIDE (CO_2) EMISSIONS (%)
Low-income	8.9	0.6	36.5	0.5
Lower-middle-income	40.3	8.3	55.4	15.7
Upper-middle-income	35.1	30.3	7.1	48.6
High-income	15.7	60.8	1.0	35.2

Sources: Population shares and global GDP shares computed from WDI (World Development Indicators) (Data Catalog), World Bank, Washington, DC, https://datacatalog.worldbank.org/search/dataset/0037712; extreme poverty shares from PIP (Poverty and Inequality Platform) (dashboard), World Bank, Washington, DC, https://pip.worldbank.org/home; carbon dioxide emissions data (2022) from Climate Watch (dashboard), World Resources Institute, Washington, DC, https://www.climatewatchdata.org/.

Note: The World Bank currently recognizes 26 economies as low-income (GNI per capita, calculated using the World Bank Atlas method, of US$1,135 or less in 2022); 54 as lower-middle-income (GNI per capita of between US$1,136 and US$4,465); 54 as upper-middle-income (GNI per capita of between US$4,466 and US$13,845); and 83 as high-income (GNI per capita of US$13,846 or more). GDP = gross domestic product; GNI = gross national income.

Figure O.2 If capital accumulation were enough, work in middle-income countries would be nearly three-quarters as rewarding as in the United States, not just one-fifth



Source: WDR 2024 team using data from PWT (Penn World Table) (database version 10.1), Groningen Growth and Development Centre, Faculty of Economics and Business, University of Groningen, Groningen, the Netherlands, https://www.rug.nl/ggdc/productivity/pwt/.

Note: The bars show the simple average for middle-income countries in 2019. The data are calculated using the methodology outlined in Jones (2016). Following Jones (2016), the figure is based on Hicks-neutral and a constant labor share of two-thirds. GDP = gross domestic product.

economic complexity of a country's export basket—a measure of sophistication—there is a rising relationship between sophistication and income for all economies that transitioned from a GDP per capita of less than US$13,000 to more than US$31,000, regardless of whether their export baskets became more or less diversified (figure O.3).

However, the pace of progress in middle-income countries is slowing. Average annual income growth in these countries slipped by nearly one-third in the first two decades of this century—from 5 percent in the 2000s to 3.5 percent in the 2010s.[3] A turnaround is not likely soon because middle-income countries are facing ever-stronger headwinds. They are contending with rising geopolitical tensions and protectionism that can slow the diffusion of knowledge to middle-income countries,[4] difficulties in servicing debt obligations, and the additional economic and financial costs of climate change and climate action.

Investment, infusion, and innovation—additively and progressively

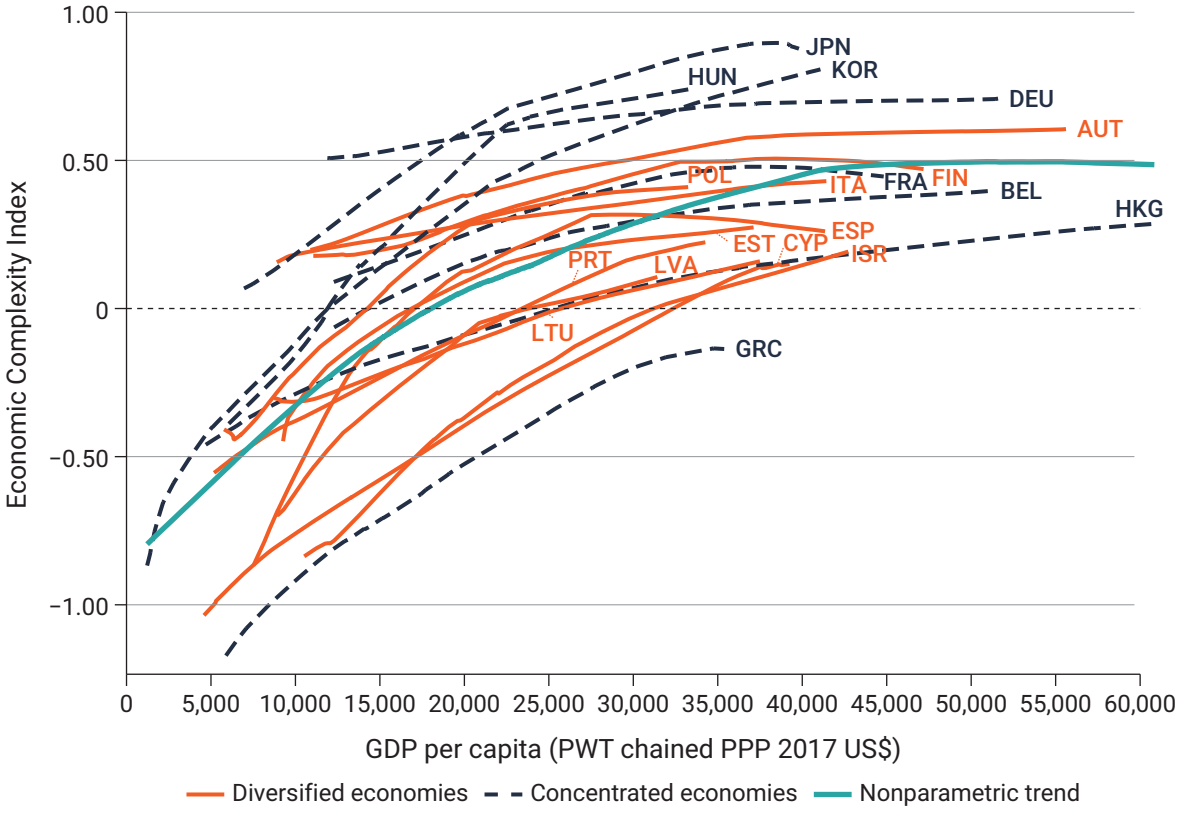
To achieve more sophisticated economies, middle-income countries need two successive transitions, not one. In the first, investment is complemented with infusion, so that countries (primarily lower-middle-income countries) focus on imitating and diffusing modern technologies. In the second, innovation is added to the investment and infusion mix, so that countries (primarily upper-middle-income countries) focus on building domestic capabilities to add value to global technologies, ultimately becoming innovators themselves. In general, middle-income countries need to recalibrate the mix of the three drivers of economic growth—*investment, infusion,* and *innovation*—as they move through middle-income status (table O.2).

What makes the move from middle-income status to high-income status so difficult? One reason is that as they move through middle-income status, countries cannot leap all at once from investment-driven growth to innovation-driven growth. Infusion of technology comes first and then innovation.

Infusion first

Economic success in lower-income countries stems largely from accelerating investment. As these economies move to middle-income status, continued progress requires complementing a good investment climate with measures deliberately designed to bring new ideas from abroad and diffuse them across the economy—so-called infusion.

Figure O.3 Economies become more sophisticated as they transition from middle-income to high-income status



Source: Bahar, Bustos, and Yıldırım (2024) using PWT (Penn World Table) (database version 10.1), Groningen Growth and Development Centre, Faculty of Economics and Business, University of Groningen, Groningen, the Netherlands, https://www.rug.nl/ggdc/productivity/pwt/.

Note: The figure plots for each economy that transitioned from GDP per capita of less than US$13,000 to more than US$31,000 (50th and 75th percentile, respectively, in 2019) the relationship between GDP per capita and sophistication of its exports. Sophistication is measured as the weighted average of the Economic Complexity Index. The figure shows the sample of economies that diversified (orange solid line)—that is, an economy's final trend is more diversified than its starting point—and those whose production became more concentrated (dark blue dashed line). For country abbreviations, see International Organization for Standardization (ISO), https://www.iso.org/obp/ui/#search. GDP = gross domestic product; PPP = purchasing power parity.

To intentionally import state-of-the-art technology, knowledge of market potential, and business practices from abroad, as well as expedite their diffusion at home (figure O.4), newly minted middle-income economies have to change tack. Policy makers must support firms that are ready and able to incorporate global technologies into production. For firms to make the most of new technologies, they need technically skilled workers in large numbers and a sufficient supply of engineers, scientists, managers, and other highly skilled professionals. Countries that are relatively open to economic ideas from abroad and have instituted strong secondary education and vocational training programs at home tend to perform better than those that have not.

The experiences of three economies that have grown quickly from the lower-middle-income to high-income levels in recent decades—Chile,

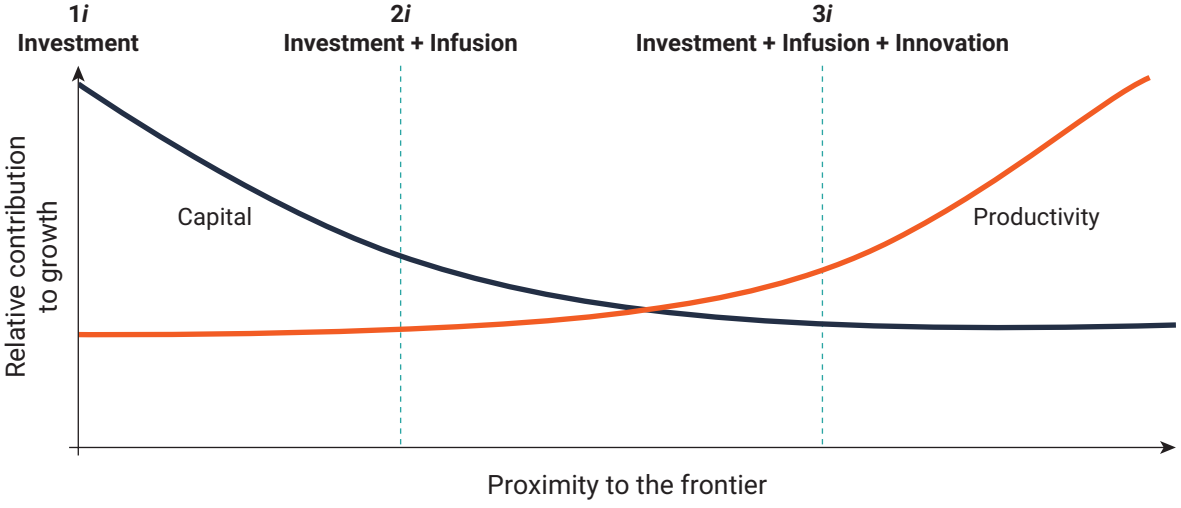
Table O.2 To achieve high-income status, countries will need to recalibrate their mix of investment, infusion, and innovation

INCOME CLASSIFICATION	INVESTMENT	INFUSION	INNOVATION
Low-income	Higher priority	Lower priority	Lower priority
Lower-middle-income	Higher priority	Higher priority	Lower priority
Upper-middle-income	Higher priority	Higher priority	Higher priority

Source: WDR 2024 team.

Note: The orange dials indicate a strategy that is a priority for that particular income group. The blue dials indicate a strategy that is less of a priority for that particular income group until the priority strategy is successfully achieved.

Figure O.4 Middle-income countries must engineer two successive transitions to move to high-income status



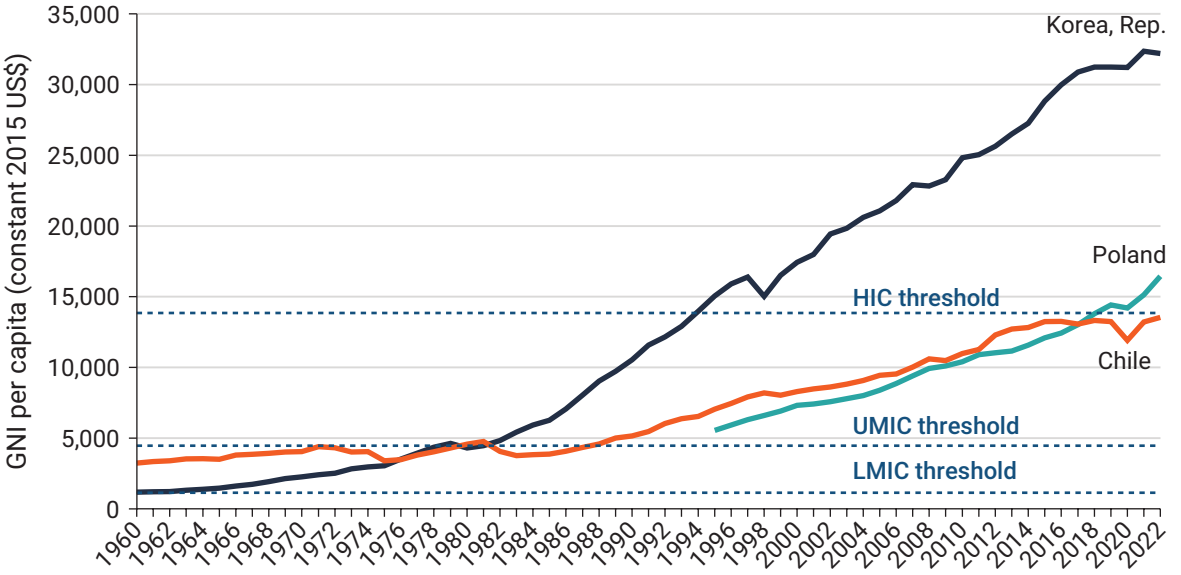
Source: WDR 2024 team.

Note: The curves illustrate the relative contributions of capital and productivity to economic growth (y-axis), according to countries' proximity to the frontier (represented by the leading economies). Countries farther out on the x-axis are closer to the frontier.

the Republic of Korea, and Poland—illustrate these ideas (figure O.5).

Korea's success may be the best support for the argument that sustaining high growth requires adding infusion to accelerations of investment, and then again augmenting the 2*i* mix with innovation policies. Korea was among the least developed countries globally in the early 1960s, with income per capita of less than US$1,200 in 1960. By 2023, after an unparalleled five-decade run of high output growth, Korea's income per capita had risen to about US$33,000.

Figure O.5 In the Republic of Korea, Poland, and Chile, the rapid growth from middle- to high-income status has been interspersed with economic crises



Source: WDR 2024 team using WDI (World Development Indicators) (Data Catalog), World Bank, Washington, DC, https://datacatalog.worldbank.org/search/dataset/0037712.

Note: GNI = gross national income; HIC = high-income country; LMIC = lower-middle-income country; UMIC = upper-middle-income country.

In the 1960s, a combination of measures to increase public investment and encourage private investment kick-started growth.[5] In the 1970s and 1980s, Korea's growth was powered by a potent mix of high investment rates and infusion, aided by an industrial policy that encouraged firms to adopt foreign technologies (figure O.6). Firms received tax credits for royalty payments, and family-owned conglomerates, or *chaebols*, took the lead in copying technologies from abroad—primarily Japan. As Korean conglomerates caught up with foreign firms and encountered resistance from their erstwhile benefactors, industrial policy shifted toward a 3*i* strategy supporting innovation. Then, as Korean firms became more sophisticated in what they produced, they needed workers with specialized engineering and management skills. The Ministry of Education, through public universities and the regulation of private institutions, did its part, setting targets, increasing budgets, and monitoring the development of these skills. These firms also required more specialized capital: for a growing middle-income economy, investment remained important.

Poland's case is different because of both its socialist past and its membership in the European Union (EU), the most powerful association of economies ever assembled. But its rapid increase in income is well known, and a Korea-like 1*i* to 2*i* to 3*i* transition is still discernible.

In the early 1990s, Poland underwent a transition from a planned economy to a market economy. It has since boosted its income per capita from 20 percent of the average for the European Union to 50 percent. What is Poland's winning strategy? It began by disciplining the large state-owned enterprises (SOEs). It hardened their budget constraints by cutting subsidies, tightening

Figure O.6 From infusion to innovation in the Republic of Korea

a. An agreement between companies to collaborate on technology

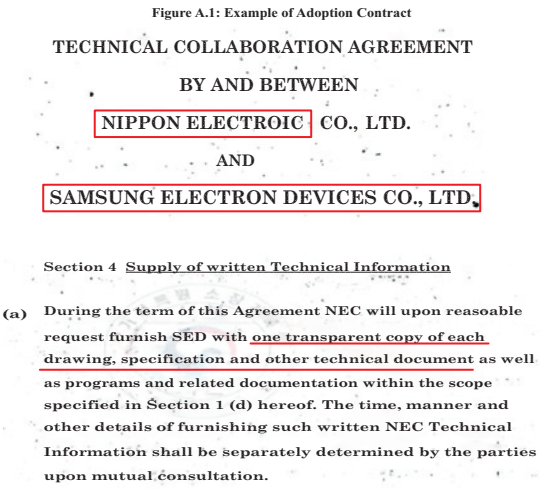


Figure A.1: Example of Adoption Contract

TECHNICAL COLLABORATION AGREEMENT

BY AND BETWEEN

NIPPON ELECTROIC CO., LTD.

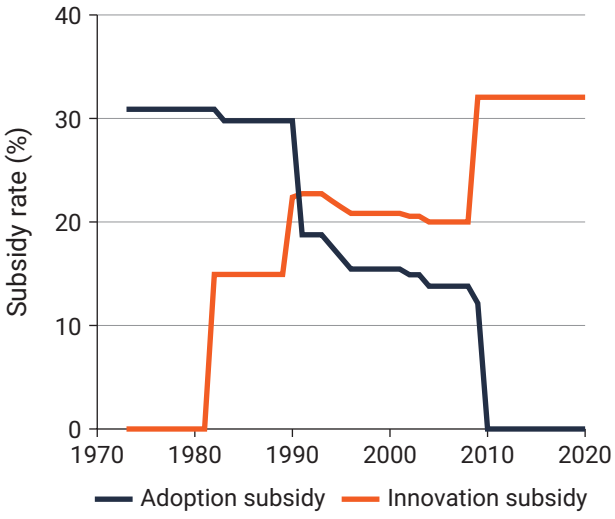
AND

SAMSUNG ELECTRON DEVICES CO., LTD.

Section 4 Supply of written Technical Information

(a) During the term of this Agreement NEC will upon reasoable request furnish SED with one transparent copy of each drawing, specification and other technical document as well as programs and related documentation within the scope specified in Section 1 (d) hereof. The time, manner and other details of furnishing such written NEC Technical Information shall be separately determined by the parties upon mutual consultation.

b. Government incentives (subsidies)



Sources: Panel a: National Archives of Korea, https://www.archives.go.kr/english/index.jsp. Panel b: Choi and Shim 2024.

Note: Panel b shows the adoption subsidy rate alongside the innovation (R&D) subsidy rate, calculated using the tax credit rate and the corporate tax rate. For example, a 30 percent subsidy rate indicates that firms can receive a reimbursement equivalent to 30 percent of their expenditures on adoption fees or R&D. R&D = research and development.

bank loans, and liberalizing import competition—including at the iconic Stocznia Gdańsk shipyard, where the Solidarność (Solidarity) movement began. This discipline paved the way for comprehensive reform. In Polish SOEs, managers shifted their focus from production targets to profitability and market share, and they upgraded firms' capabilities to prepare for privatization.[6] Poland then built on this foundation to attract investment, focus on infusion next, and turn to innovation last. It followed this sequence largely by raising productivity with technologies infused from Western Europe—a process accelerated in the 2000s by its entry into the EU common market, which spurred foreign direct investment. Poland also increased tertiary education rates from 15 percent in 2000 to 42 percent in 2012. Educated Poles put their skills to work across the European Union, opening another channel to infusing global knowledge into the Polish economy.

Chile's success has similar features. In 2012, Chile became the first Latin American country to reach high-income status, just two years after joining the Organisation for Economic Co-operation and Development (OECD). Chile has grown and diversified its exports since the 1960s, when mining made up about four-fifths of its exports. This share is now about half. Knowledge transfers from advanced economies have been supported by both public and private institutions. The public Chilean Agency for Exports Promotion (ProChile) has bolstered small and medium enterprises (SMEs), which over 2013–16 contributed one-third of export value added—the other two-thirds being contributed by large domestic exporters.[7] And Fundación Chile, a private nonprofit created in 1976, promotes technology transfer for domestic ventures. One example is the adaptation of Norwegian salmon farming technologies to local conditions, making Chile a leading world exporter of salmon.

Innovation next

Once a middle-income country has begun to exhaust the potential of infusion in the most promising parts of its economy—running out of technologies to learn and adopt—it should expand its efforts to become an innovation economy. But this transition is as or more daunting than the preceding one.[8] Infusion is powered mainly by the technology transfers embodied in flows of physical and financial capital.

Although innovation requires both of these flows, it also needs increasingly vigorous exchanges of human capital—often triggered by a reengagement with the emigrant diaspora, but also creating the conditions cherished by innovators such as freer economies, human rights, and livable cities. Moreover, to enable firms to innovate, governments must have done a lot during the infusion phase to reform and strengthen institutions. Weak institutions are as debilitating as premature attempts to leapfrog from investment to innovation. In some cases, ignoring the imperative of infusion to quicken innovation can even worsen the investment climate, setting middle-income economies back years if not decades. Latin America, ground zero for the middle-income trap, provides a cautionary example.

After reaching middle-income status in the 1970s, Brazil veered in the wrong direction. Its policy makers attempted to encourage firms to innovate by bypassing the infusion of foreign technologies. In 2001, the government implemented an innovation-driven economic growth strategy, driven in part by fears that foreign technology would exacerbate domestic inequality and lead to dependence on the more advanced economies in the North Atlantic. Notably, it imposed a 10 percent marginal tax rate on payments for international intellectual property. These tax revenues were used to subsidize innovation in targeted sectors, including biotechnology, aviation, health, and agriculture.[9]

One study found that the subsidies stimulated a rapid rise in applications at the Brazilian patent office, but the patents turned out to be of low quality and lacked any relevance to global markets. Moreover, as the share of firms that applied for patents within the economy increased, the wage premium for skilled workers declined, as did the value added.[10]

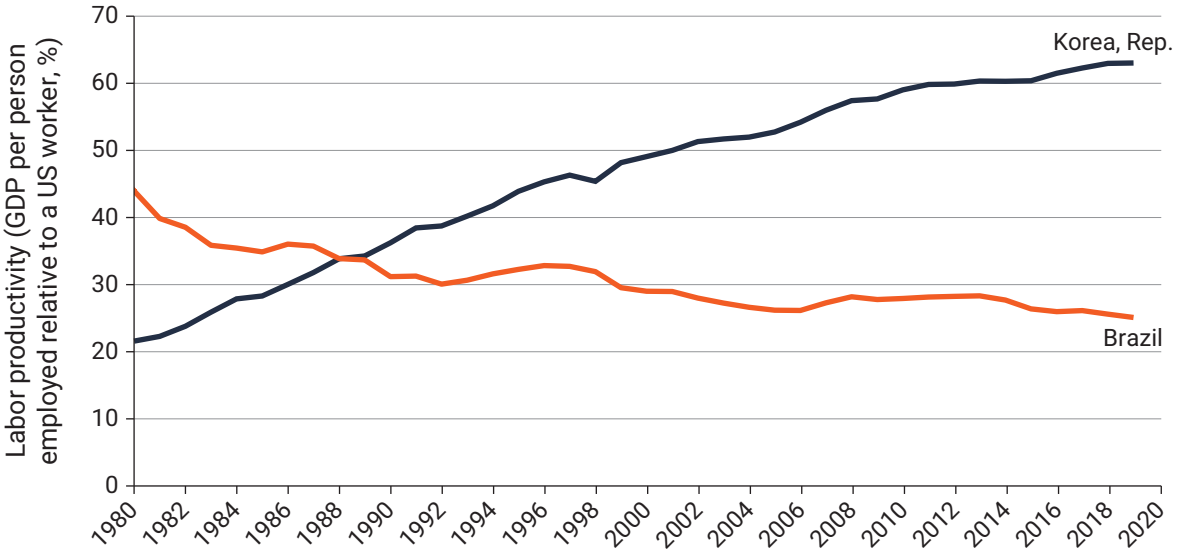
While Brazil was stumbling at home, Korea was racing around the world, making the infusion of foreign technology the cornerstone of domestic innovation. In 1980, the average productivity of a worker in Korea was just 20 percent that of the average US worker. By 2019, it had tripled to more than 60 percent (figure O.7). By contrast, Brazilian workers, who had been 40 percent as productive as their US counterparts in 1980, were just 25 percent as productive by 2018.

There are no shortcuts to innovation. It is unlikely that industrial policy will enable countries to leapfrog from an investment- and manufacturing export–driven model to an innovation-oriented model or services-led model of economic growth. The development literature is littered with reports recommending a leap from investment to innovation, skipping the stage of painful reforms to attract foreign investment and ideas. However, middle-income governments that have tried to spare their citizenry the pains associated with reforms and openness have also kept from them the gains that come from sustained growth.

The economics of creative destruction

The shifts from 1*i* to 2*i* to 3*i* strategies are neither smooth nor linear. They require a mix of economic, social, and political change that Karl Marx and other philosophers considered impossible under capitalism. They reasoned instead that market-based economies would be riddled with a growing concentration of wealth and wracked by crises until capitalism was replaced by communism. Joseph Schumpeter changed this debate with his 1942 treatise *Capitalism, Socialism and Democracy* and the phenomenon of "creative

Figure O.7 Over the last four decades, as the Republic of Korea's labor productivity relative to that of the United States continued to climb, Brazil's peaked—and then sagged



Source: WDR 2024 team using data from PWT (Penn World Table) (database version 10.1), Groningen Growth and Development Centre, Faculty of Economics and Business, University of Groningen, Groningen, the Netherlands, https://www.rug.nl/ggdc/productivity/pwt/.

Note: GDP = gross domestic product.

destruction."[11] For Schumpeter, the crises in capitalist economies could be simultaneously painful and restorative.

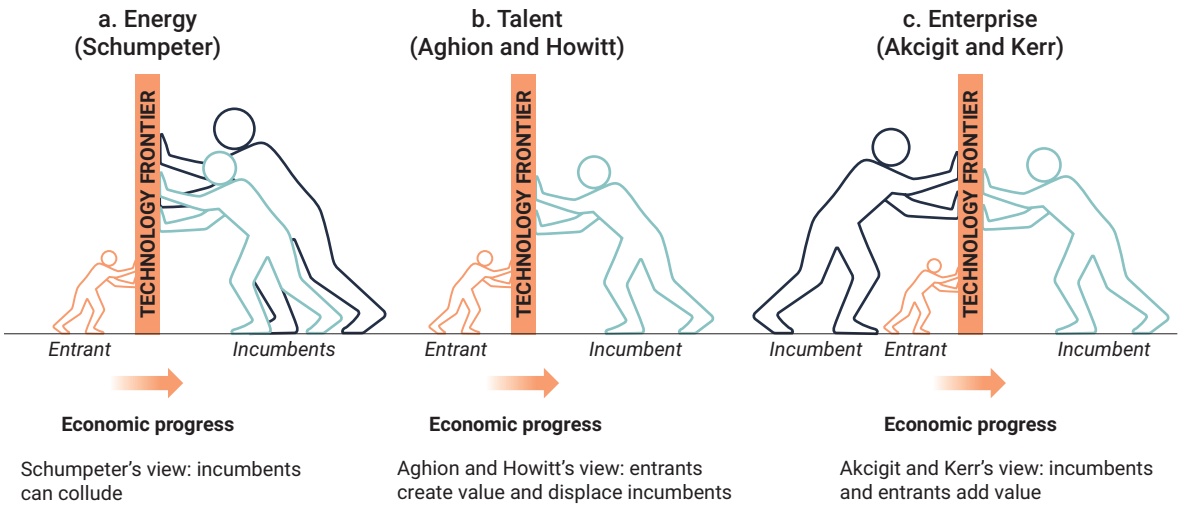
Nearly a century later, many of Schumpeter's insights appear to have been confirmed. Indeed, his admonitions and insights have been used by modern Schumpeterian theorists—most notably, Aghion and Howitt (1992) and Akcigit and Kerr (2018)—to construct formal frameworks. These advances in growth theory are useful in helping solve the hardest problem facing the global economy today: how should the 108 middle-income countries with 75 percent of the world's people, 60 percent of global emissions, but just 40 percent of global output correct these imbalances while converging toward the living standards of advanced economies?

Schumpeterian ideas provide helpful clues. Success seems to come most quickly to societies that balance the economic forces of *creation, preservation,* and *destruction*.

Energy: Incumbents can collude (Schumpeter's view)

Joseph Schumpeter (1942) wrote that society benefits when entrepreneurs with talent and vision introduce new products and technologies, displacing old products and business models and generating ever-higher productivity and growth. Often, however, incumbents collude to preserve the status quo (figure O.8, panel a). In today's environment, Schumpeter's view is perhaps best reflected in the contest between high- and low-carbon energy. High-carbon energy, particularly coal, has been an incumbent technology for over 300 years (box O.1). Technical progress has followed a path over which the efficiency with which fossil fuels are extracted and burned has increased, urban infrastructure has been built around the private motor vehicle, social attitudes and personal preferences are supportive of high carbon consumption, and political pressure groups represent carbon-intensive interests.

Figure O.8 Three views of creative destruction



Source: WDR 2024 team based on Schumpeter (1942); Aghion and Howitt (1992); Akcigit and Kerr (2018).

Box O.1 Who and what are incumbents? Leading firms, technologies, nations, elites—and men

Incumbents are firms that usually have well-established brand names recognized and trusted by consumers. They often have better access to financial resources, such as capital for investment and technological infusion, and human resources, such as experienced employees. They also may have established relationships with suppliers and distributors, which can be leveraged to maintain a competitive edge. And they have resources to invest in research and development and to invent products and processes they can protect with patents.

Incumbents are well-established energy sources such as fossil fuels. Since 1709 when Abraham Darby, a British ironmaster, first smelted iron ore with coke, coal has been the fuel of choice around the world. In the more than 300 years since Darby's innovation, coal has become the largest source of electricity generation worldwide, producing more than one-third of global electricity in 2022.[a] Cities and economies have been built on cheap coal-powered energy, fueling their prosperity. However, the widespread use of coal generates the highest energy-related carbon dioxide emissions—15.5 gigatons—representing 42 percent of total emissions in 2022.

Incumbents are technologically advanced nations. They can share technologies with emerging economies through investing in, licensing, training, and hosting foreign students. For decades, they were instrumental in supporting the growth of emerging economies. But today, they are erecting walls to subsidize their domestic firms, blocking others from joining their value chains.

(*Box continues next page*)

Box O.1 Who and what are incumbents? Leading firms, technologies, nations, elites—and men *(continued)*

Finally, *incumbents are elites in society.* They are always powerful, generally wealthy, and—in middle-income economies—mostly men. But they are not all against progress. Elites can have the education and resources to accelerate growth by infusing their economies with global technologies. For a middle-income country seeking to infuse and innovate, elites may serve as the go-to pool of trained professionals, managers, entrepreneurs, and innovators. Men are also incumbents, for centuries enjoying better education and job opportunities than women and defining laws and institutions, often to buy social, economic, and political power. Such power has given them an outsize say in deciding who studies where and what, who gets a well-paid job, and who gets to start a business. Meanwhile, misogyny may keep women out of the market or at least the most desired jobs and business opportunities.

Large firms, social elites, powerful men, and advanced economies have, however, also helped new entrants. The size and ownership of enterprises and the socioeconomic status and gender of individuals are not reliable attributes on which to base policy.

a. IEA (2023).

The result is that the returns to investing in high-carbon activities are large because of all the complementary high-carbon investments that have been made.

In many middle-income countries, power markets are still a monopoly: an SOE operating under a vertically integrated utility remains in charge of generation, transmission, distribution, and the retail supply. This arrangement hinders competition and results in the inefficient use of resources. In addition, in many middle-income countries the first generators dispatched are often not those with the lower marginal prices (that is, power dispatch often does not follow merit order), serving as a barrier to the expansion of renewables with rapidly declining costs. In countries that include Pakistan, Poland, South Africa, and Türkiye, SOEs account for 84 percent of total installed capacity. By contrast, the private sector owns about an equal share (80 percent) of the installed capacity of renewable energy.[12]

Although advances in low-carbon energy can help to decouple economic growth from carbon emissions, the diffusion of low-carbon technologies in middle-income countries is patchy, reflecting a landscape of legacy policies that preserve a high-carbon economy. Middle-income countries have a greenhouse gas (GHG) intensity of GDP that is 3.5 times higher than that of high-income countries. This difference reflects both the misallocation in the use of energy (with the energy intensity of GDP also 2.5 times higher than in high-income countries) and the lower diffusion of low-carbon energy technologies (figure O.9, panel a).

Talent: Entrants create value and displace incumbents (Aghion and Howitt's view)

Schumpeter's ideas on creative destruction served as the inspiration for one of the most influential papers in economics that emerged from a fortuitous collaboration between two economists. In the summer of 1987, Philippe Aghion, a new professor at the Massachusetts Institute of Technology (MIT), and Peter Howitt, a Canadian economist, formalized a theory of creative

destruction in which economies expand mainly through innovation by entrants.[13] Entrants challenge incumbents and become the protagonists of economic growth (figure O.8, panel b).

This formulation of creative destruction emphasizes the importance of both creating ever-larger reservoirs of talent and improving the allocation of talent to tasks. Not investing in the talents of women and minorities, keeping them out of the most rewarding activities, and adopting unfair compensation practices are surely the most self-defeating attributes of middle-income economies, where skills are already scarce. When these practices are discouraged, the payoff can be immense. In the United States between 1960 and 2010, the decline in gender and racial discrimination in education and work explains up to 40 percent of the observed growth during that period.[14]

As they grow, middle-income countries will need skilled workers such as engineers, technicians, and managers, but they have smaller reservoirs of skilled talent than advanced economies. And yet preservation forces discourage the acquisition of talent. Talent is wasted wherever that acquired through education, training, and work experience is allocated not by merit, but according to other factors outside the control of individuals. Gender, family background, ethnic and cultural identity—none of these factors should matter for school enrollment or career prospects in a country aspiring to grow rapidly through infusion and innovation. But for the average child in a middle-income country today, they matter all too much.

Economically and socially mobile societies are better at developing skills and utilizing talent, but social mobility in middle-income countries is about 40 percent lower than that in advanced economies.[15] Middle-income countries will need to ensure that more individuals, regardless of their parents' circumstances, have better opportunities to become skilled workers. And social mobility matters much more in middle-income countries than in low-income countries simply because the former need more skilled workers to invest, infuse, innovate, and grow (figure O.9, panel b).

Figure O.9 Creation is a weak force in middle-income countries, where it is characterized by a rampant misallocation of resources

a. In middle-income countries, economic growth is more carbon-intensive than in high-income countries, and middle-income countries lag in energy efficiency and adoption of low-carbon technologies

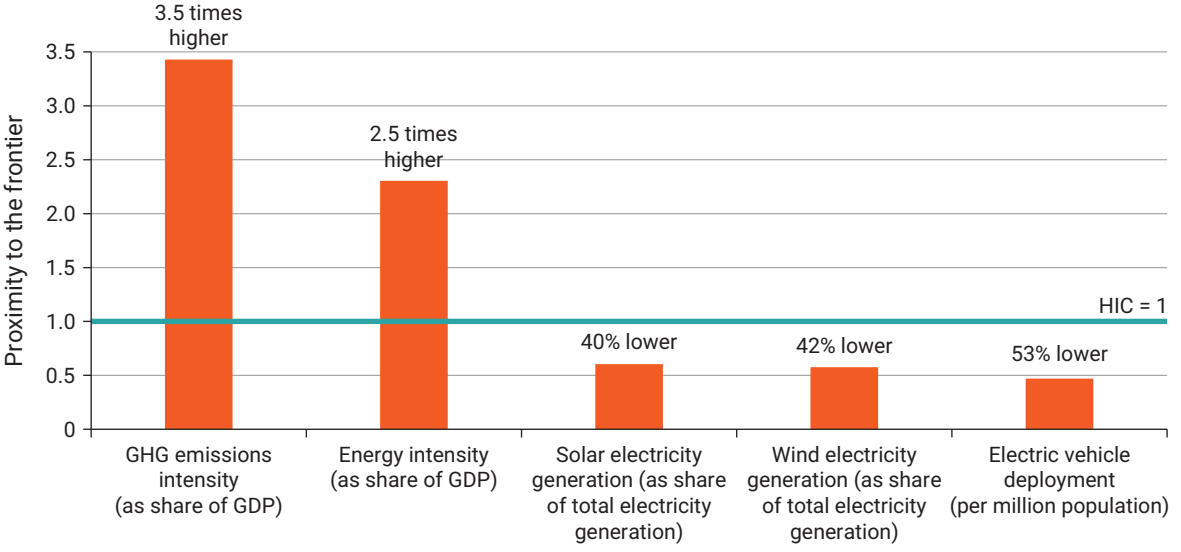


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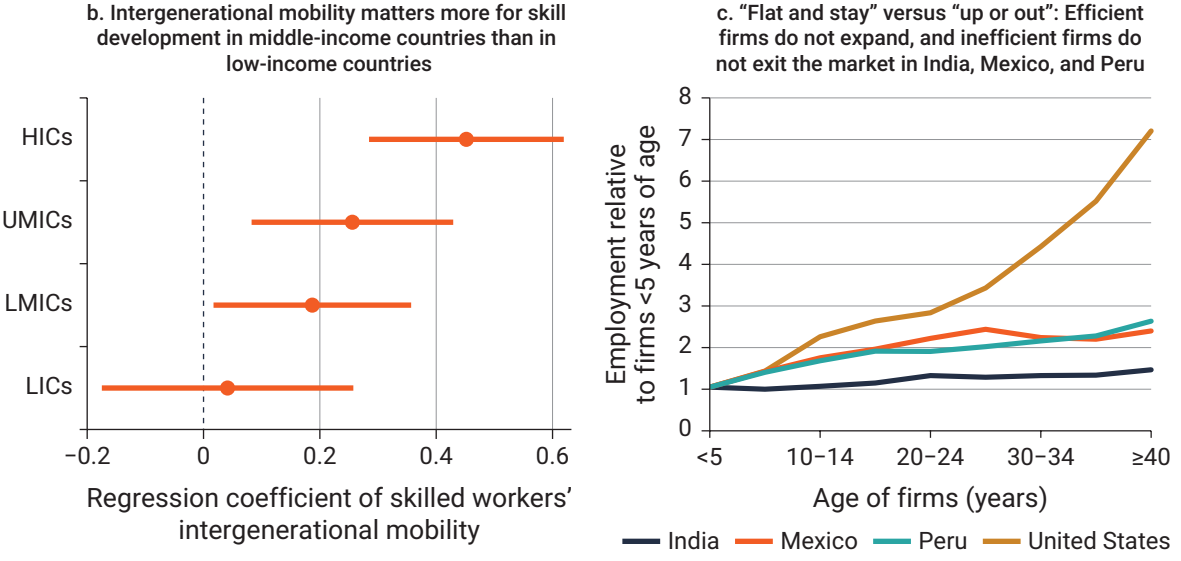
Figure O.9 Creation is a weak force in middle-income countries, where it is characterized by a rampant misallocation of resources *(continued)*



Sources: Panel a: Chepeliev and Corong 2022; Energy Institute 2023; Statistics Data (portal), International Renewable Energy Agency, Abu Dhabi, United Arab Emirates, https://www.irena.org/Data; WDI (World Development Indicators) (Data Catalog), World Bank, Washington, DC, https://datacatalog.worldbank.org/search/dataset/0037712. Panel b: WDR 2024 team estimates based on GDIM (Global Database on Intergenerational Mobility) (dashboard), Data Catalog, World Bank, Washington, DC, https://datacatalog.worldbank.org/search/dataset/0050771/global-database-on-intergenerational-mobility. Panel c: India, Mexico, and the United States: Hsieh and Klenow 2014; Peru: World Bank 2015.

Note: Panel a displays for middle-income countries compared with an index of 1, representing the high-income country (HIC) frontier, the greenhouse gas (GHG) emissions intensity of the gross domestic product (GDP), the energy intensity of GDP, the share of solar and wind energy in total electricity generation, as well as the battery electric vehicles per million population. Panel b plots regression coefficients of intergenerational mobility (which is equal to 1 minus the intergenerational relative mobility) for different country groups at the 95 percent confidence interval. The dependent variable in the regression is the share of skilled workers ("Legislators, sr. officials, managers"; "Professionals"; "Technicians and associate professionals"). The regression controls for the log of GDP per capita when the 1980s birth cohort was growing up. Intergenerational mobility estimates are for educational mobility of the 1980s cohort from the World Bank's GDIM. HICs = high-income countries; LICs = low-income countries; LMICs = lower-middle-income countries; UMICs = upper-middle-income countries. Panel c illustrates the average employment across a cohort of firms of different ages in the cross-section of firms. The number of employees serves as a proxy for firm size. The y-axis axis reports the average employment of each cohort relative to the average employment across firms under five years of age.

Why do preservation forces persist in constraining the opportunities for so many people? Part of the answer is that preservation insulates members of social elites from the forces of destruction that, in a more open society with meritocratic institutions, might dissipate their advantages in wealth and privilege. The same forces ensure that, beyond elites, few children will get the chance to climb to a higher rung on a country's income ladder than that occupied by their parents. So, income inequality remains high and social mobility remains low, transmitting inequality across generations, exacerbating the inequality of opportunity.

Three kinds of preservation forces perpetuate social immobility in middle-income countries, shutting out talent from economic creation. The first force is *norms*—biases that foreclose or limit opportunity for women and other members of marginalized groups. Next are *networks*—above all, family connections. And the last force is *neighborhoods*—regional and local disparities in access to education and jobs. Although all three factors can have positive impacts on talent

creation—filling voids left by missing markets and services—they become forces of preservation when they block the disadvantaged from accessing opportunity.

Enterprise: Incumbents and entrants add value (Akcigit and Kerr's view)

The original Schumpeterian premise that new entrants drive change and create new economic potential while incumbents are inert runs counter to the latest empirical evidence on enterprises. Globally, larger and more established firms are infusing new knowledge into their businesses at a higher rate than smaller firms. In middle-income countries, it is the large firms that are employing the majority of highly skilled workers.[16] Throughout the twentieth century, the United States effectively transitioned its innovation focus from individuals working in their garages to established firms, leveraging advantages such as risk management, market access, brand reputation, and collaboration. These firms now account for over 75 percent of patents filed at the United States Patent and Trademark Office.[17]

A third generation of Schumpeterian economists have formalized the idea that both incumbent enterprises and entrants can create value (figure O.8, panel c).[18] Market leaders—successful incumbents—can bring *scale* and advance domestic industry by investing in upgraded products and business practices, as well as technology for new markets. Scale allows for adopting modern management practices, for hiring and rewarding skilled workers, and for making the most productive use of large amounts of capital. In other words, scale gives incumbents the power to boost their efficiency, whether in the expectation of competition from other incumbents or from entrants or in response to it. Scale also allows incumbents to specialize in multiple product lines, changing course to parry the new offerings of competitors.

However, the forces of creation are weak in middle-income countries. In India, Mexico, and Peru, for example, if a firm operates for 40 years, it will roughly double in size. In the United States, the average firm that survives that long will grow sevenfold (figure O.9, panel c). For firms in middle-income countries, this implies a "flat and stay" dynamic: firms that fail to grow substantially can still survive for decades. By contrast, for US firms the dynamic is "up or out": facing intense competitive pressure, a few entrepreneurs will expand their businesses rapidly, while most others will exit quickly. Among the majority who exit the market, many will become wage earners at the most flourishing firms.

In keeping with the flat and stay dynamics, firms in India, Mexico, and Peru tend to remain microenterprises: nearly nine-tenths of firms have fewer than five employees, and only a tiny minority have 10 or more. The longevity of undersize firms—many of them informal—points to market distortions that keep enterprises small while keeping too many in business. For example, a high regulatory cost attached to formal business growth may inhibit an efficient firm from gaining market share and driving out inefficient competitors. Such policy-induced distortions in middle-income countries result in misallocated resources, hampering creation and infusion at scale.

Balancing the three forces

Looked at it this way, middle-income countries face common challenges in balancing the three forces:

- *Creation—the primary protagonist of economic growth—is a weak force in many middle-income countries*. Large incumbents are slow to develop new products and processes, and, although small firms are continually entering various markets, most of them do not create or disrupt. Periods of growth are also times of creation, and thus of structural change.
- *Preservation—the arch antagonist of creation—is the strongest force in middle-income countries.* The same market leaders who could enable middle-income countries to speed up the infusion of global

knowledge are too often slowing down the process. Incumbent firms and elites are often successful in keeping things as they are whether through market power and collusion, through capture of policies and regulations, or through education systems and labor markets that place more importance on socioeconomic status than on talent or merit.

- *Destruction—a necessary evil that clears the way for creation by freeing up misallocated resources and sweeping away outdated institutions—is kept weak in middle-income countries by opposition from those with market power or government influence.* A growing economy that requires new arrangements in capital, labor, and energy markets needs to release itself from less efficient ones. To the extent that weak institutions and policies preserve outdated arrangements, creative destruction is stifled. However, this opposition tends to weaken during crises—whether economic, political, or ecological. When crises place intense pressure on governments to act, a window opens for reforms.

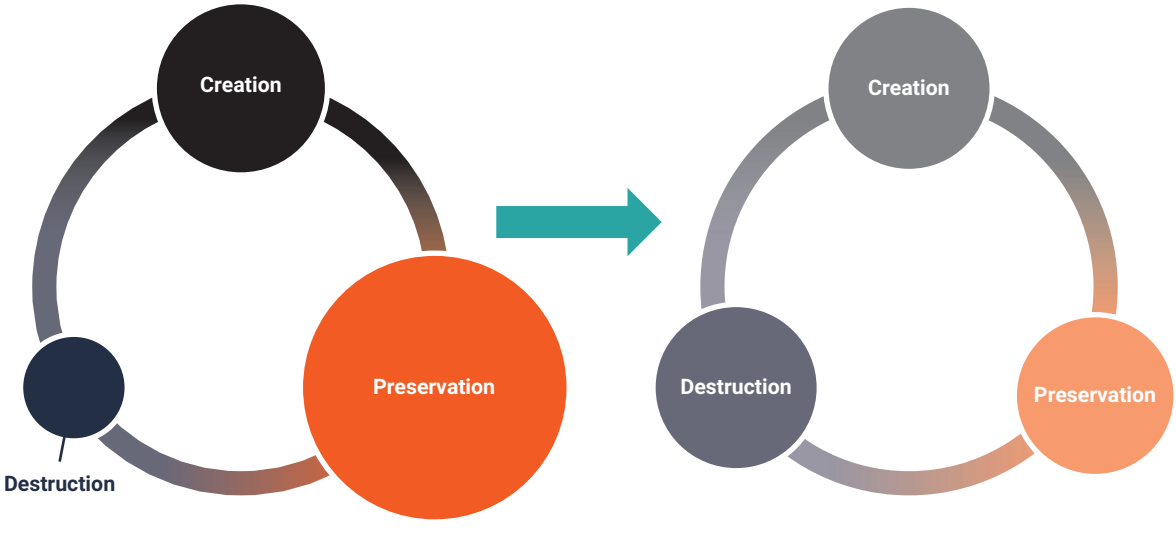
Striking the right balance

Middle-income countries are hampered by an imbalance among the forces of creation, preservation, and destruction. The forces of creation are weak, the forces of preservation are strong, and destruction is held back by the forces of preservation. Middle-income countries must therefore balance these forces (figure O.10). That means

- *Disciplining incumbency* to weaken the forces of preservation
- *Rewarding merit activities*—those with positive effects on general well-being and that aid in the efficient use of talent, capital, and energy—to strengthen the forces of creation
- *Capitalizing on crises* to aid the destruction of outdated policies and institutions that are difficult to dislodge during boom times.

These principles can help middle-income countries calibrate the mix of their three *i*'s—*investment, infusion,* and *innovation*—as they plan to accelerate economic growth. Because both incumbent firms and entrants can add value,

Figure O.10 Middle-income countries have to strike a balance among creation, preservation, and destruction



Source: WDR 2024 team.

industrial policies will need to focus on disciplining incumbency. And because the talent of women and disadvantaged groups is grossly underutilized, social policies will need to focus more on rewarding their merit and advancing social and economic mobility. And finally, because economic growth over the last three centuries has been emissions-intensive, middle-income countries will need to capitalize on today's energy crisis to cut emissions while balancing energy access and security.

Enterprise, openness, and reforms

Countries growing out of low-income status into middle-income status tend to have a 1*i* strategy for accelerating *investment.* Stronger institutions are needed to control inflation, ensure financial and macroeconomic stability, expand economic and political freedoms, and enforce the rule of law to encourage both domestic and foreign investment. Even if all middle-income countries enjoyed such enabling conditions, a 1*i* strategy would not be enough to support sustained growth and move these countries out of the middle-income level. Why? The returns from capital investment alone decline steadily. Growth in middle-income countries is boosted when economies take on new structures, enabled by a 2*i* strategy focusing on both investment and infusion. Institutions will need to create an environment conducive to integrating global technologies into the domestic economy.

Make markets globally contestable

Contestable markets—and the institutions that enable them—are vital for middle-income countries that aim to become a global supplier and sustain rapid economic growth through sophistication and scale.

Contestability is not chaos: it does not mean that firms in middle-income countries cannot earn comfortable market positions, becoming established and relatively difficult to displace. However, contestability does mean that firms feel pressure to compete because their current products and processes can be displaced by technologically sophisticated producers from other countries. Such contestability is central to creative destruction.

A key part of contestability is openness to foreign investors and global value chains that give domestic firms access to larger markets, technology, and know-how and allows them to add value and grow. And they are encouraged to make use of that access, thereby exposing domestic firms to competition, but also inspiration, from international firms that operate at or near the global technology frontier. Firms at home can seize the opportunity to infuse technology, increase the sophistication of their operations, and scale up, or they can keep doing business as usual and be eased out.

For example, in Chile imports of Chinese products rose at an average pace of 27 percent a year from 2001 to 2007, and large Chilean incumbent firms, or market leaders, boosted their product innovation by 15 percent and their product quality by 22 percent.[19] In Argentina, after MERCOSUR (Southern Common Market) was established, domestic firms in sectors facing export tariff reductions began to invest more in computing technology and in technology transfers and patents.[20] Again, in 12 European countries over 2000–2007 more than 15 percent of the increase in patenting, information technology intensity, and productivity was driven by import competition from China—and successful European firms boosted management quality while increasing research and development (R&D) and adding new skills.[21]

Connect local firms with market leaders

Because local firms often do not have information on specific technologies and the know-how to adopt them, consultants and advisory firms founded by experts can provide expertise and advice on technology adoption and implementation. Market leaders—especially multinationals—are often vanguards in technology and technical capabilities and can be some of the best partners for local firms, working together to deploy new technologies. The government can help make the relevant connections. For example, in Chile the Supplier Development Program, which offers

large domestic buying firms an incentive to connect with suppliers that are SMEs, increased the suppliers' sales by 16 percent and their employment by 8 percent. It also boosted the sales of large sponsor firms by 19 percent.[22] Governments can also provide firms with information on market opportunities, enabling them to access finance and strengthen their capabilities, as well as to recognize opportunity and mobilize themselves to take advantage of it.[23]

Reduce factor and product market regulations

Reforms that roll back protection for specific activities, enterprises, families, or industries reinforce the gains from openness. However, today middle-income countries are slow to combine investment with infusion and innovation, stymied by the powerful institutional and regulatory forces of preservation. Especially binding are product market regulations. Besides imposing constraints on international trade and investment, these regulations prop up state control of business and impose legal and administrative barriers to entrepreneurship, thereby hobbling investment and infusion at scale.

Move away from coddling small firms or vilifying large firms

Small and medium-size enterprises are widespread in middle-income countries. Ideally, subsidies would help SMEs grow into larger, more productive companies that pay higher wages and adapt knowledge. But the same support also strengthens the forces of preservation by reducing incentives for a productive firm to expand, deterring it from scaling up production. Many firms in middle-income countries remain small even when long established; they simply do not aspire to grow.[24] The abundance of small firms in middle-income countries does not solely mirror the challenges they face. Instead, it indicates a deficiency in competition, originating from larger firms that would have displaced them in the market if they had expanded.[25] Blanket support for small firms can curtail the exit of unproductive small businesses, perpetuate smallness, crowd out other firms, and misallocate resources.[26] In countries that include Japan, Mexico, and Viet Nam, public support for small firms—not necessarily young firms—reduced productivity and increased resource misallocation.[27]

Even where tax codes do not create explicit provisions based on firm size, middle-income countries may be creating a practical subsidy to SMEs through size-dependent tax enforcement—that is, governments with weak tax collection capacity may concentrate enforcement on larger firms.[28] In Mexico, eliminating distortions created by size-dependent taxation policies favoring small firms could boost output by 9 percent.[29] In Chile, China, and India, reductions in distortions helped these economies close the gap between actual and potential productivity by 10 percent.

Let go of unproductive firms

Letting inefficient firms and business models fail is a core principle of creative destruction. Studies of firm exit—stemming from seminal work by Hopenhayn (1992)—have revealed that the exit of less productive firms contributes substantially to raising aggregate productivity. In many countries, during periods of trade liberalization the exit of the least productive firms has boosted growth.[30] In middle-income countries, however, bureaucratic frictions prolong the survival of zombie firms—inefficient, debt-ridden companies that crowd out investment by productive firms.[31] Reforms of bankruptcy laws should focus on enabling failed businesses to exit swiftly and predictably and on allowing viable businesses to restructure.

Strengthen competition agencies

As segments of an economy master infusion, they will need to adopt a 3*i* strategy. Institutions can foster the development of new technologies and ensure that entrants—new entrepreneurs—are not blocked by established incumbents, regulatory barriers, and entrenched industry practices. Antitrust laws can help prevent abuse of dominance by established incumbents. As economies (or sectors) move closer to the technology frontier, competition agencies will need

to consider a possible trade-off between innovation incentives and market power.[32] Although market power enables investment in R&D to bring new ideas to market, firms may resort to anticompetitive behavior. Thus, competition and innovation policies need coordination, alongside developing independent, capable competition authorities.

For upper-middle-income countries shifting to a 3*i* strategy, a special concern is the containment of killer acquisitions—that is, when incumbents acquire innovative firms specifically to kill future competing products and technologies.[33] But not all acquisitions are deadly: many young entrepreneurs make a deliberate effort to be acquired by an incumbent, producing complementary innovations that an incumbent can scale up.

Deepen capital markets

Switching from a 2*i* to a 3*i* strategy also has implications for how firms access finance. Equity markets can be instrumental in supporting innovative activities, especially in private firms, which typically face larger financing gaps than publicly listed firms. However, private markets for equity financing lack depth and access in emerging economies (figure O.11). Start-up incubators and accelerators can be particularly helpful, providing mentorship, resources, networking opportunities, and sometimes funding to help start-ups grow and compete.

Education, social mobility, and entrepreneurship

As more parts of an economy shift from 1*i* to 2*i* and 3*i* strategies, demand increases for highly skilled workers—technicians, managers, scientists, and other professionals. This demand can increase income inequality. But, if it is accompanied by policies that expand access to higher education and reduce barriers for women and other disadvantaged groups so that they are now rewarded for their skills and able to create new businesses, it also generates greater social mobility.[34] Such conditions can provide both social stability and economic dynamism, which are equally necessary for middle-income countries to grow to high-income status. In fact, barriers to social mobility can derail a country's plans for moving beyond a 1*i* strategy.

Discipline, not vilify, elites

Social and economic elites can be either creative or inimical to creation. For a middle-income country seeking rapidly to enrich its talent pool, it would be self-defeating to lower elites' ambitions. Elites are most able to invest in their children's education—and larger investments, and better investment choices, yield increasing returns to parental background.[35] Elites are also best connected for job searches and placements. And elite women can most readily become role models for other women through education and professional work. However, elites—like large incumbent firms—need to be disciplined because of their power to capture institutions. If elites hog education, jobs, capital, and assets for themselves, thereby limiting access to outsiders, a middle-income country is suffering from elite capture: by preserving privilege, it is stymying creation.

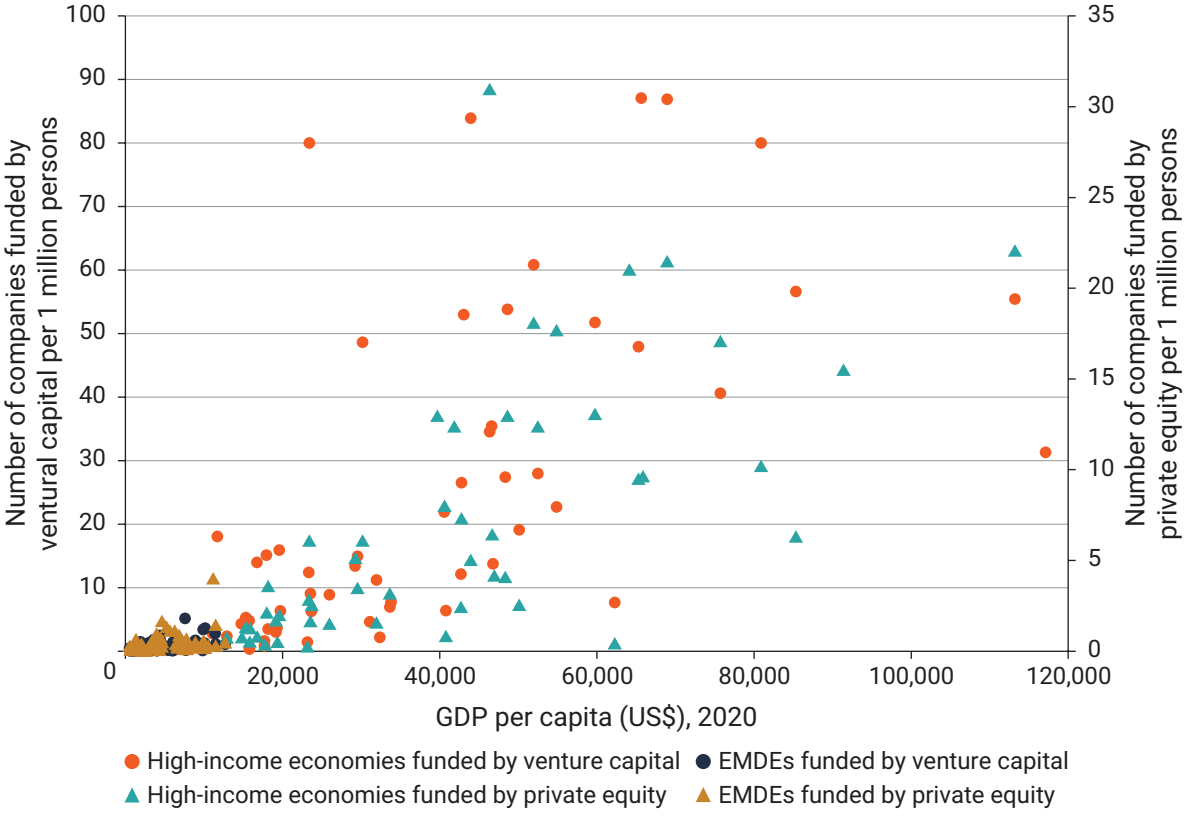
Invest in talent and reward merit

People who are not only talented, but also—crucially—educated and have access to labor markets, enterprise opportunities, and business financing are key to the 2*i* and 3*i* strategies. Policy makers should especially consider initiatives to educate women, along with other excluded and marginalized groups, and to let families become more socially and economically mobile with each succeeding generation.

From the successes of former middle-income countries that have attained high income, three simple lessons emerge for education reform:

- *Broaden access to foundational skills.* Graduate more students from high school, broadening and deepening the talent pool.

Figure O.11 In emerging market and developing economies, few companies are funded by venture capital or private equity



Source: Didier and Chelva 2023.

Note: The figure displays the number of companies funded by venture capital (left axis) and private equity (right axis) from deals concluded 2018–19. Economies are classified according to the World Bank's income classification as of June 2020 (Serajuddin and Hamadeh 2020). EMDEs = emerging market and developing economies; GDP = gross domestic product.

- *Monitor learning outcomes using student assessments.* Gauge progress toward explicit policy goals.
- *Embed educational reforms in a national economic growth strategy.* For example, in the early 1970s, as Finland's economy became less resource-dependent and agrarian and more urban and industrial, the country reformed education to meet the demands of firms and of a growing middle class.

Growing the talent pool takes time, and past mistakes can impede countries for decades. Although many middle-income countries have expanded tertiary education, a critical difference between those that graduated to high-income status and those that did not is that the former never wavered in their commitment to foundational skills, thereby developing a large pipeline of talent. Missing the opportunity to learn while in school is largely irreversible for children; they may not have a chance to study later in life. Strengthening foundational skills requires efficient and effective spending on education because spending by itself is not a guarantee of better learning outcomes.[36] Countries may consider adopting the "progressive universalism" principle: add incrementally

to higher education investments as the quality at lower schooling levels rises to include more students.

Meanwhile, middle-income countries are not only talent-scarce relative to advanced economies, but also not nearly as effective in allocating the existing talent to tasks. For example, these countries do not fully reward the talents of women and people from less privileged families, while simultaneously protecting less able people from privileged families from competition in education.

Policies to ensure equal opportunities for women, minorities, and other disadvantaged groups whose talents have been undeveloped or unrewarded are likely to increase both economic efficiency and equity. However, in many countries patriarchal gender norms are part of a deeply entrenched system of preservation, limiting women's earning power and social and economic mobility across occupations and generations. Where economic and social rights favor men, middle-income countries that aspire to grow quickly must work hard to grant the same opportunities to women. Institutions and policies are needed to counter the exclusion of women—among others—from education, employment, enterprise financing, and contracting and to provide policies such as childcare support or flexible work for both men and women.

In education, policies that support girls who stay in school longer by offering them scholarships or conditional cash transfers can improve outcomes for women.[37] To boost female students' interest in science, technology, engineering, and mathematics (STEM), mentoring and information interventions have proven to be among the most effective methods.[38] However, because women face social, family, and logistical constraints—including household and childcare responsibilities—educating women is most effective when complemented by other interventions to address these constraints.

Leverage digital technologies

Digital technologies—such as the internet, mobile phones, social media, and web-based information systems—can promote both social mobility and talent development. When Nandan Nilekani, one of India's leading technology entrepreneurs, was tasked with developing Aadhar (the country's digital identification system) in 2009, he paved the way for Indians to accumulate digital capital (digital footprints of online activity and digital payments). Digital footprints become digital capital, which individuals own and can choose to make available to lenders when getting access to credit. Digital data on payments, receipts, taxes, and loan repayments all make it possible to assess financial credibility. According to a recent study, digital capital has increased entrepreneurship and business income in India and has favored small-scale vendors and economically lagging districts.[39] By delivering instructional material, digital technologies also provide students from disadvantaged backgrounds with opportunities to learn.

Reward innovators and scientists to match brain drain with brain gain

Investing in advanced skills is costly. Individuals invest in these skills with the expectation that their talent and acquired ability will be rewarded.[40] However, these rewards are often found on foreign shores. *World Development Report 2023* reported that in middle-income countries, 10 percent of highly skilled workers emigrate, with high-level skills in greater demand in Western Europe and North America.[41] To counter the brain drain, the report recommended that origin countries expand their capacity for training highly skilled workers because greater capacity increases the likelihood that a sufficient number of highly skilled workers will stay even when others migrate.

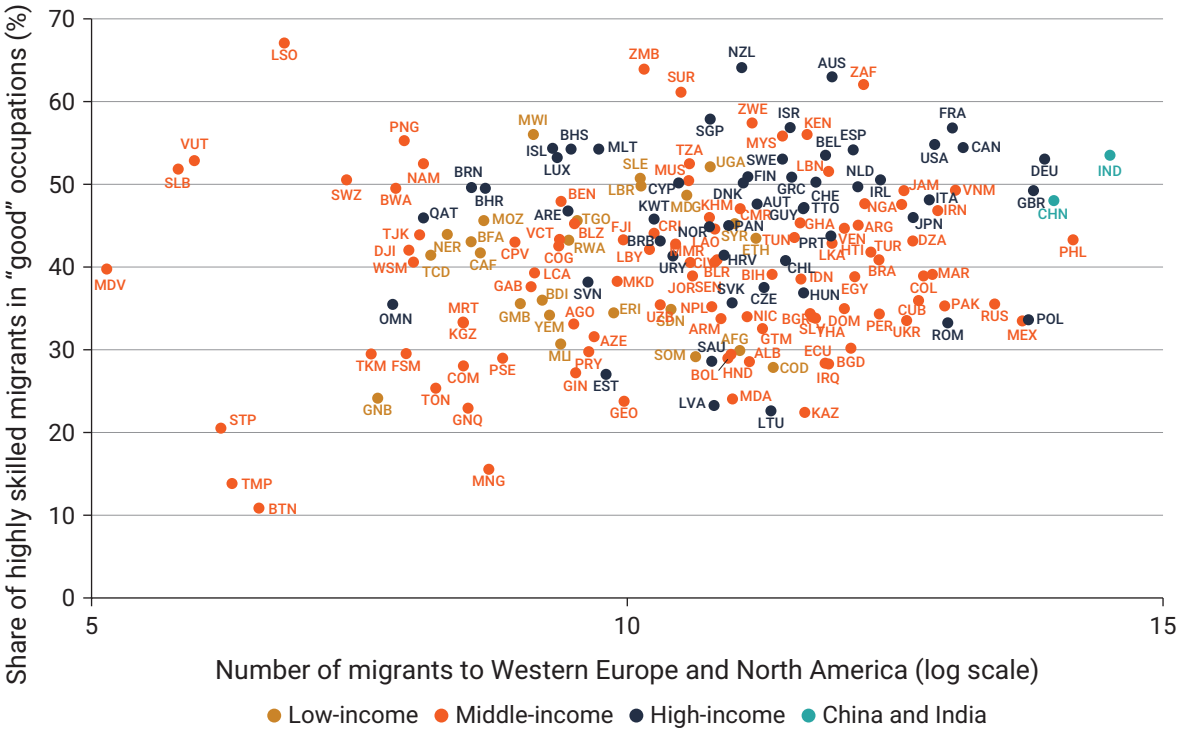
As countries adopt a 3*i* strategy, they will need to tap into the knowledge and know-how of a country's diaspora. The emigration of highly skilled individuals can serve as an opportunity

for the origin country if emigrants remain connected to the origin country—or even return. This is particularly relevant in conflict-affected countries such as Ukraine that have experienced a large outflow of highly skilled individuals. When the demand for advanced skills increases, the diaspora becomes an important talent pool to germinate innovation at home.

As migrants acquire skills abroad, migration may drive a brain gain in the sending country. Whether the sending country experiences brain drain or brain gain varies across countries, depending largely on how the sending country's policies address emigration. The most likely migrant to be exposed to modern production processes and technologies and to transmit valuable knowledge back to the origin country is highly skilled, moves to an advanced economy, and works there in a leading occupation as a manager, professional, or technician (figure O.12).

Building and expanding high-quality universities—institutions that can train top talent and contribute to innovation—require an efficient system of public funding for research, along with fluid university-industry connections

Figure O.12 Countries with large, successful diasporas have the highest potential for knowledge transfers



Source: WDR 2024 team.

Note: Data on migration flows by skill and current occupation are from OECD DIOC 2010–11, which covers migration flows from 200 origins to 34 OECD (Organisation for Economic Co-operation and Development) country destinations. Each scatter point represents an origin (or birth) country. For each birth country, the x-axis shows the number of migrants over 15 years of age who had completed tertiary education and were living in destination countries in Western Europe or North America (AUT, BEL, FRA, DEU, NLD, CHE, USA, GBR, IRL, CAN, ESP, ITA, DNK, NOR, SWE; in logs), and the y-axis the share of these tertiary-educated migrants working as managers, professionals, or technicians ("good" occupations) in the destination country. For country abbreviations, see International Organization for Standardization (ISO), https://www.iso.org/obp/ui/#search.

to promote exchange of knowledge. Most efficient for middle-income countries is to focus public funding on a few strategic research areas, such as STEM, health, and energy transition, with funds allocated competitively and based on performance. Partnerships with world-class universities can be a strategy for developing a research base.

To encourage knowledge exchanges between universities and industries, countries could grant R&D funding for such partnerships. Governments could also offer firms tax incentives for collaborating with universities. Establishing a regulatory framework for knowledge exchange is key—especially to define the government's intellectual property rights to knowledge produced by universities with public resources. One desirable outcome of university-industry collaboration is venture creation by university faculty, staff, students, and postdoctoral fellows, with private investors serving as venture capitalists. Universities can also form partnerships to provide services to local companies.

Energy, emissions, and crisis management

The destruction of outdated arrangements—enterprises, jobs, technologies, private contracts, policies, and public institutions—is essential for an economy to ensure that it has the appropriate balance of investment, infusion, and innovation. But in many countries the forces of destruction are weak during boom times, whereas crises often play an outsize role in weakening the forces of preservation, making way for the forces of creation.

In the context of energy, the oil price shocks in the 1980s increased the relative cost of fossil fuels and played a major role in accelerating investments in energy efficiency and the development of cleaner energy technologies.[42] The global financial crisis of 2007–09 coincided with a significant increase in the uptake of renewables.[43] Renewable energy use grew rapidly in the United States, China, and Germany in part because of the stimulus programs governments enacted to address the crisis. Today, two crises—the climate crisis and the global energy crisis—are combining to drive rapid progress in low-carbon technologies, defined as technologies or applications that counter the effects of climate change.

Discipline advanced economies to reduce the cost of global decarbonization

As middle-income countries move to a 2*i* strategy, they will have opportunities to join globalized supply chains for low-carbon products and reduce the cost of decarbonization worldwide. However, their success will depend on advanced economies easing up on protectionism in trade policy. Protectionist measures in advanced economies could prove to be the bane of the global energy transition.

Previous waves of middle-income countries have transitioned to high-income status with the help of coordinated trade policies in a globally integrated economy. By contrast, today's middle-income countries are navigating a hazier trade landscape. Countries have not yet agreed on the key rules for low-carbon energy product supply chains. And "make local" subsidies will likely do a lot to relocate production—to the United States, to the European Union, and to a growing number of other economies that are embracing "reshoring" efforts and enacting local content requirements. For example, initial modeling suggests that the US Inflation Reduction Act will substantially attract industry toward the United States, Mexico, and Canada and away from other major producers.[44] In effect, these subsidies and protectionist measures in high-income countries threaten to lock middle-income countries out of low-carbon value chains.

To be clear, subsidies have a role to play in a global transition to low-carbon energy sources in view of the positive externalities of such a transition and the extent of today's market failures. But they should not distinguish between domestic and foreign suppliers. Each segment of the value chain should be located where a product can be made at the lowest cost, averting a risk of protectionist retaliation and a race to the bottom

(the most distorted and least efficient market structure). But such globally rational thinking is rarely favored by leaders with domestic politics on their minds. They are unlikely to enact subsidies consistent with a globally integrated economy because such subsidies would allow gains from supply chain reallocation to accrue to firms based in other countries.

Faced with this conundrum, policy makers in advanced economies should consider that the energy transition to low-carbon energy sources has many benefits, not just through its effects on the climate, but also through its implications for the economic development of middle-income countries. To lock middle-income countries out of global value chains with protectionist measures is to deny firms and industries in those countries the benefits of learning-by-doing spillovers.

To accommodate middle-income countries and support a global transition to low-carbon energy, policy makers in advanced economies will need to update trade policy rules by limiting green subsidies, export controls, and import controls and using clear language to define their appropriate use. One option is to modify existing agreements with supplementary clauses, much in the same way that Articles 20 and 21 of the General Agreement on Tariffs and Trade (GATT) were used to carve out exceptions. Such clauses can transparently acknowledge that all countries need to nurture emerging domestic industries if they are to achieve a just transition with energy security. But the use of subsidies should also be restricted to specific circumstances, such as the need for public support to develop and commercialize innovative low-carbon technologies.

Decouple emissions from economic growth

Rising incomes increase the demand for energy—even as they tend to intensify public concern about the environment and awareness that carbon emissions drive climate change. Furthermore, as middle-income countries ramp up the sophistication of their economies by switching to 2*i* and 3*i* strategies and expand their use of artificial intelligence and machine learning, their demand for energy will rise dramatically. In fact, the International Energy Agency (IEA) has predicted that the electricity demand by global data centers will more than double from 2022 to 2026, with artificial intelligence playing a major role in that increase.[45]

Middle-income countries will need to decide how best to reduce the carbon emissions of their growing economies—a combination of energy intensity (energy consumed per US dollar of GDP) and carbon intensity (carbon emissions per unit of energy). Today, emissions from a growing economy outweigh the reductions in emissions from lowering energy intensity and carbon intensity. To decouple emissions from economic growth, governments will need to discipline incumbency, reward merit, and derisk investments in low-carbon energy:

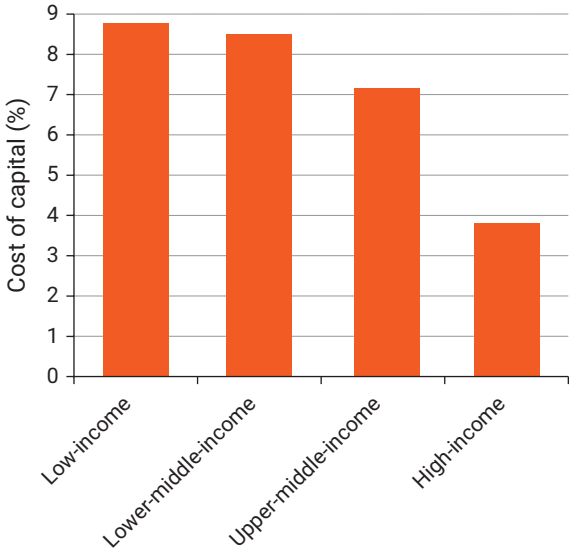
- *Disciplining incumbency.* Disciplining the incumbency advantage is especially important for increasing energy efficiency and decoupling emissions from economic growth. Market contestability, as well as opportunities for value-adding firms to grow, spurs the adoption of energy-saving technologies. In Georgia, for example, markets with a higher concentration have lower energy efficiency. In Argentina, firms with a higher share of skilled workers are better able to adopt advanced green technologies.[46] Exporters also tend to have lower emissions intensity than nonexporters.[47] If incumbents are disciplined, energy price increases hold considerable potential for firms to reduce energy intensity. In the longer term, increases in energy prices tend to be fully compensated for by higher efficiency.[48] A major challenge is that energy prices do not reflect costs—economic or ecological. Estimates suggest that middle-income countries account for 93 percent of explicit fossil fuel subsidies.[49] A promising approach is to consider the concept of total carbon price (TCP) to assess the

price signal from a combination of direct and indirect carbon pricing instruments, including energy excise taxes and fuel subsidies.[50]

The incumbency advantage also should be disciplined in the electricity industry, where incumbent SOEs dominate fossil fuel power generation and block the entry of new players.

- *Rewarding merit.* The most efficient way to scale up the efficient provision of low-carbon energy is to respect the *merit order*: the sequence followed by grid operators selling power to the market. The starting point is set by the cheapest offer, made by the power station with the lowest running costs, which determines wholesale market prices. Any provider who can offer renewable energy at zero marginal cost—that is, with insignificant operating costs—should have priority in meeting demand. When the merit order functions as designed, it shifts prices along the supply curve, which energy economics calls the "merit order curve."[51]
- *Derisking investment.* The cost of capital for low-carbon energy such as solar photovoltaic and wind in middle-income countries is twice that in high-income countries, averaging 3.8 percent in high-income countries, but 7.2 percent in upper-middle-income countries and more than 8.5 percent in lower-middle-income countries (figure O.13).[52] Addressing technology risk, development risk, and pricing risk can help incentivize investors—utilities, banks, or other institutions—to invest in low-carbon energy. *Derisking* requires a whole-of-economy approach. It depends on licensing, policy stability, and social acceptance, along with reducing technical, market, and regulatory risks.[53] Derisking will make renewable energy projects less expensive, as well as reduce the public finance needed to support these projects.

Figure O.13 In low- and middle-income countries, the cost of capital for renewables is high



Source: IRENA 2023.
Note: Data are for 2021 and 2022.

The road ahead

Three decades ago, Professor Robert Lucas, Jr., likened the development strategies that led to spectacular economic growth in Korea to the making of a "miracle."[54] Given the changes in the global economy since the time that Korea was a middle-income economy, it would be fair to conclude that it would be a miracle if today's middle-income economies manage to do in 50 years what Korea did in just 25. It might even be miraculous if they replicated the impressive achievements of other successful countries such as Chile and Poland. But that is exactly what governments in Bangladesh, Brazil, China, India, Indonesia, Mexico, Morocco, South Africa, Türkiye, Viet Nam, among others, hope to accomplish.

To do this, these countries will have to become more disciplined. They will have to time the shift from simpler investment-led growth strategies (1i) that worked well in the early stages of development to augmenting investment accelerations with intentional policies that aid the infusion of know-how from abroad (2i), and only then expend sizable

resources on innovation (3i). Put another way, they will have to become more efficient in their use of capital—both financial and human—and labor and energy.

To do this, they will have to shed long-held prejudices about enterprise, talent, and energy. They will have to appreciate the importance of reliable information to shape and quicken the structural transformations that must accompany any durable increase in incomes and living standards. Depending on their special circumstance and the stage of development they have reached, they will need to adopt a sequenced and progressively more sophisticated mix of policies (table O.3). Low-income countries can focus solely on policies designed to increase investment—the 1i approach. Once they attain lower-middle-income status, they will need to shift gears and expand the policy mix to 2i, investment + infusion. At the upper-middle-income level, countries will have to shift gears again to 3i: investment + infusion + innovation. Middle-income countries will need progressively greater economic freedom, more open and informed debates, and—frequently—the political courage to change stubborn institutions and long-standing arrangements.

Table O.3 The 3*i* strategy: What countries should do at different stages of development

	LOW-INCOME COUNTRIES 1*i*: Investment	LOWER-MIDDLE-INCOME COUNTRIES 2*i*: Investment + Infusion	UPPER-MIDDLE-INCOME COUNTRIES 3*i*: Investment + Infusion + Innovation
Enterprise	• Improve the investment climate to increase domestic and foreign investment.	• Discipline market leaders through integration into globally contestable markets. • Diffuse global technologies with fluid factor and product markets. • Reward value-adding firms to stimulate business dynamism.	• Deepen capital markets and expand equity financing. • Strengthen antitrust regulation and competition agencies. • Protect intellectual property rights.
Talent	• Invest in human capital by broadening foundational skills and improving learning outcomes.	• Discipline elites by providing equal opportunities for women, minorities, and disadvantaged groups. • Improve allocation of talent to task. • Develop links among local and globally leading universities. • Allow emigration of educated workers whose skills are not valued in domestic markets.	• Strengthen industry-academia links domestically. • Expand programs to connect with diaspora in advanced economies. • Enhance economic and political freedoms.
Energy	• Increase investment in expanding access and grid networks. • Reform regulatory frameworks to attract private investment and ensure fair competition.	• Discipline SOEs by hardening budget constraints. • Use international coalitions to encourage advanced economies to ease protection of domestic incumbents. • Aid adoption of energy-efficient practices. • Enhance economic efficiency by reflecting environmental costs in energy prices.	• Lower the cost of capital for low-carbon energy by reducing risks involving technology, markets, and policy. • Increase multilateral finance for very long-term investments.

Source: WDR 2024 team.

Note: SOEs = state-owned enterprises.

Notes

1. Throughout this Report, data on GDP and income per capita are as of July 1, 2023.
2. Gill and Kharas (2007).
3. Kose and Ohnsorge (2024).
4. Melitz and Redding (2021).
5. Soh, Koh, and Aridi (2023).
6. Pinto (2014).
7. Marcel and Vivanco (2021).
8. Lucas (1988); Romer (1990).
9. de Souza (2022).
10. de Souza (2022, 2023).
11. Schumpeter (1942).
12. Vagliasindi (2023).
13. Aghion and Howitt (1992).
14. Hsieh et al. (2019).
15. van der Weide et al. (2021).
16. Gottlieb, Poschke, and Tueting (2024).
17. Akcigit, Grigsby, and Nicholas (2017).
18. Akcigit and Kerr (2018).
19. Cusolito, Garcia-Marin, and Maloney (2023).
20. Bustos (2011).
21. Bloom, Draca, and Van Reenen (2016).
22. Arráiz, Henríquez, and Stucchi (2011).
23. Cirera and Maloney (2017).
24. Eslava and Haltiwanger (2020); Hsieh and Olken (2014).
25. Akcigit, Alp, and Peters (2021).
26. Bertoni, Colombo, and Quas (2023); Kersten et al. (2017).
27. Aivazian and Santor (2008); López and Torres (2020); Tsuruta (2020); Vu and Tran (2021).
28. Bachas, Fattal Jaef, and Jensen (2019).
29. López and Torres (2020).
30. Melitz (2003).
31. Didier and Cusolito (2024).
32. Cheng (2021); Gal et al. (2019).
33. Cunningham, Ederer, and Ma (2021).
34. *Social mobility* is intergenerational movement up or down a country's income ladder, allowing children to move away from their parents' position relative to generational peers.
35. Becker et al. (2018).
36. Angrist et al. (2023); World Bank (2018).
37. Chaudhury and Parajuli (2010).
38. Muñoz-Boudet et al. (2021).
39. Dubey and Purnanandam (2023).
40. Akcigit, Baslandze, and Stantcheva (2016).
41. World Bank (2023).
42. Peters et al. (2012).
43. UNEP (2009).
44. Baqaee and Farhi (2023).
45. https://time.com/6987773/ai-data-centers-energy-usage-climate-change/.
46. Albornoz et al. (2009).
47. Holladay (2016); Richter and Schiersch (2017).
48. Bashmakov (2007); Bashmakov et al. (2023).
49. Black et al. (2023).
50. Agnolucci, Gencer, and Heine (2024). TCP components labeled "energy taxes" and "energy subsidies" are based on "net" computed values (as proxies for the actual values of energy taxes and subsidies) due to data limitations. Energy taxes and subsidies are estimated based on the "price gap" between retail prices and supply costs for a particular energy carrier used in a specific sector in a jurisdiction in a given year. The net energy taxes and subsidies are then aggregated across sectors, fuels, and countries to yield a global value. More details on this methodology are provided in Agnolucci, Gencer, and Heine (2024).
51. Acemoglu, Kakhbod, and Ozdaglar (2017).
52. Estimates of the cost of capital are based on the cost of debt and the cost of equity. The cost of debt is the cost to finance a loan for a renewable energy asset. The cost of equity is the return on equity required by the project developer (IRENA 2023).
53. Noothout et al. (2016).
54. Lucas (1988).

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The Middle-Income Trap

Middle-income countries are in a race against time. Many of them have done well since the 1990s to escape low-income levels and eradicate extreme poverty, leading to the perception that the last three decades have been great for development. But the ambition of the more than 100 economies with incomes per capita between US$1,100 and US$14,000 is to reach high-income status within the next generation. When assessed against this goal, their record is discouraging. Since the 1970s, income per capita in the median middle-income country has stagnated at less than a tenth of the US level. With aging populations, growing protectionism, and escalating pressures to speed up the energy transition, today's middle-income economies face ever more daunting odds. To become advanced economies despite the growing headwinds, they will have to make miracles.

Drawing on the development experience and advances in economic analysis since the 1950s, *World Development Report 2024* identifies pathways for developing economies to avoid the "middle-income trap." It points to the need for not one but two transitions for those at the middle-income level: the first from *investment* to *infusion* and the second from *infusion* to *innovation*. Governments in lower-middle-income countries must drop the habit of repeating the same investment-driven strategies and work instead to infuse modern technologies and successful business processes from around the world into their economies. This requires reshaping large swaths of those economies into globally competitive suppliers of goods and services. Upper-middle-income countries that have mastered infusion can accelerate the shift to innovation—not just borrowing ideas from the global frontiers of technology but also beginning to push the frontiers outward. This requires restructuring enterprise, work, and energy use once again, with an even greater emphasis on economic freedom, social mobility, and political contestability.

Neither transition is automatic. The handful of economies that made speedy transitions from middle- to high-income status have encouraged enterprise by disciplining powerful incumbents, developed talent by rewarding merit, and capitalized on crises to alter policies and institutions that no longer suit the purposes they were once designed to serve. Today's middle-income countries will have to do the same.

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