

The World of Work in Developing Countries

VOLUME 2

DEVELOPING COUNTRY TRENDS AND INSIGHTS FROM FOUR COUNTRY CASE STUDIES

Project Director Daniel F. Runde

Authors

Romina Bandura MacKenzie Hammond



THE

FUTURE OF GLOBAL STABILITY

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he future of work has recently attracted much attention from a variety of institutions, from governments to universities to private companies and news outlets. Our world of work—both in rich and poor countries—is changing fast. Technology, globalization, environmental changes, and shifting demographics are impacting workplace environments and the types of jobs that will be available in the future. Everyone can relate to these issues, since people depend on work for their livelihoods.

In 2018, CSIS conducted a project focusing on the changes taking place in the world of work in developing countries and exploring their implications for the national security of the United States and future global stability. Developing countries, many of which are U.S. allies, need to generate jobs to meet the aspirations of their people and build strong economies. A lack of jobs in developing countries leads to negative spillovers in the form of migration, instability, fewer consumers for U.S. goods, and weaker partners and allies who can help bear the burden of global problems.

Ninety-five percent of the world's consumers are located outside the United States, entwining the economic future of the United States with the rest of the world through global trade. Many of these countries have a strong consumer base that purchases U.S. goods and services, while others are potential future consumers of U.S. goods and services. Helping developing countries prepare their workforces and create the conditions for job growth not only helps the United States and the world avoid the negative spillovers associated with inadequate employment, but will bring positive impacts, including increased purchases of U.S. goods and services.

Much of the current discussion on the future of work centers on fast-paced technological changes and the perceived job losses and transformations in Western We want to create wealth for Americans and our allies and partners. Prosperous states are stronger security partners who are able to share the burden of confronting common threats.

-U.S. National Security Strategy

economies. The focus is on the pace of impact of the Fourth Industrial Revolution (4IR), that is, how the interaction of automation, robotics, artificial intelligence, and other technological drivers will have an unprecedented and distinctive disruption in terms of the "velocity, scope and systems impact."^{2,3} Past technological revolutions have created and destroyed jobs, but overall had a positive impact in terms of net jobs; this time, the potential effects are debated.⁴ Overall, the future impact is uncertain but calls for societies to start making changes now.

There are myriad books, reports, and initiatives on the future of work already. For example, a simple Google search of the term *future of work* produces more than 2 billion results. There is no doubt that automation, robotics, artificial intelligence, and other technological drivers are impacting the world of work. In developing countries technological changes need to be evaluated in a larger context that includes multiple work-related challenges and opportunities such as exploding youth bulges, high informality, resource constraints, and urbanization.

In the developing world, other forces beyond technology stand poised to impact labor markets. First, these countries are rapidly urbanizing, creating challenges for cities in terms of infrastructure, job creation, and basic social services. Second, different regions are following varied demographic transition paths that will affect the number of potential workers, the composition of the workforce, and the types of jobs created. Third, global trends like increased trade, environmental challenges, and migration will also continue to create challenges and opportunities in labor markets around the world. At the same time, many economies are facing "jobless growth" and struggling to create meaningful work opportunities for their citizens. These changes require us to think about the types of jobs, skills, and safety nets that economies need to generate to meet people's aspirations. If economies do not produce enough good jobs and if institutions do not prepare the workforce for the current and future needs of the labor market, regional, national and global stability will be compromised. The United States can play an important role in supporting transitions in developing countries brought on by the coming changes in the world of work.

To narrow the scope of the study, CSIS focused on four middle-income countries (MICs) with per capita incomes between \$1,000 and \$12,000 per year, as defined by the World Bank.⁵ We chose countries (Brazil, India, Nigeria, and Kazakhstan) with diverse characteristics in the size of their labor forces, their geographic location, and the state of their demographic transitions. The countries are also diverse in terms of their economies: some rely more on agriculture and mining, while others are more service-oriented. Two countries (Nigeria and Kazakhstan) have relied on the extraction of their natural resources—mainly oil—for too long but are making efforts to diversify their economies. The OECD also

classifies Nigeria as a "fragile" state, that is, a country with significant exposure to risks and a weak capacity to manage those risks. CSIS prepared four country case studies to do a deep dive analysis on their labor markets. These countries face many current challenges and demographic changes and automation will create added pressures to create jobs. At the same time, these countries possess invaluable assets including natural resource endowments, an entrepreneurial population, and youth who are not afraid to take risks and voice their concerns. The country case studies are published as separate documents.

Many institutions and scholars are analyzing these issues in depth and providing recommendations on how to move forward. Through this project, we hope to raise more awareness and provide food for thought on some of the main debates surrounding the topic. We divided the report into two standalone documents: volume 1 and volume 2. Volume 1 elevates the issue as one of strategic interest to the United States and proposes a more focused approach via U.S. bilateral development agencies and multilateral fora. This second document (volume 2) presents a summary of the future of work discussion in developing countries and provides insights from the four country case studies.⁷

Managing the future of work challenges will require responses from individuals, governments, educational institutions, non-government and civil society organizations (CSOs), and companies on several fronts. Better education systems and reskilling to adapt to changing technological disruptions will without doubt be important, but economies also need to create more and better jobs, and safety nets and social protection systems will need strengthening to help workers transition through the different stages of their working lives.



■ mployment in developing countries has ■ changed over the last 25 years (Figure 1).8 Agriculture has historically been the largest supplier of jobs in developing countries, holding more than 52 percent in 1990, but today it accounts for 30 percent of employment. Based on the three main economic sectors as classified by the UN (agriculture, industry and services), much of agricultural employment was absorbed by the service sector, while industry employment has remained relatively stable (at 20 percent). In what has been called "premature deindustrialization," developing country economies are relying on service sector jobs without undergoing a broad-based industrialization stage, and failing to reach the high economic growth (and related development of human and physical capital) that industrialization historically provided.¹⁰ Manufacturing has historically

▼ Figure 1 Employment Trends in Developing Countries, Percentage of Total Employment

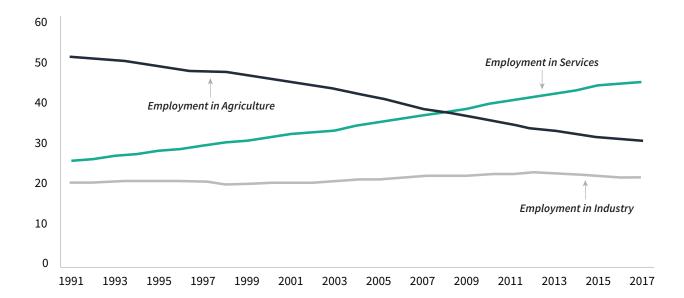
Source: ${\rm ILO^{11}}$, Sourced from World Bank's World Development Indicators (WDI),

Note: Includes low and middle-income countries

been associated with development. In the past, countries that focused their economic strategies on manufacturing exports achieved high levels of prosperity. Manufacturing absorbed a large amount of low-skilled labor and led to productivity gains, especially for economies open to trade.¹²

The worry is that technological shifts along with a retrenchment in trade will make it even harder for developing countries to adopt manufacturing as a pathway for development.¹³ In some regions of the developing world (particularly in Latin America and the Caribbean and Sub-Saharan Africa) both the value-added of manufacturing and employment in the sector have shrunk. Employment has been moving to the service sector but generating low productivity jobs. Countries in East Asia have been able to weather the storm.¹⁴

At the heart of premature de-industrialization is an underlying "jobs deficit" challenge: the world needs to create around 600 million jobs over the next 15 years to absorb the number of youth projected to enter the labor market. ¹⁵ Today, more than 70 million youth are unemployed. ¹⁶ Moreover, 30



Solving the world of work challenges is harder than brain surgery. -William Reese,

International Youth Foundation

to 45 percent of the working-age population globally is underutilized, meaning they are either inactive or work less than they would like to (i.e., they are underemployed). At the same time, improving the quality of jobs is imperative: as it currently stands, 60 percent of workers globally (or 2 billion people) are employed in the informal sector and almost 30 percent of those employed in developing countries do not earn enough to lift themselves and their families above the poverty threshold. 17,18 Informal workers lack legal and social protections, work in hazardous conditions, have low productivity jobs, and do not contribute to the tax base of any given country. Many of these informal workers are women. These are some of the major challenges that labor markets in developing countries must address.

CHALLENGE 1

JOBLESS GROWTH

Economies need to create meaningful employment opportunities via the private sector. The private sector is responsible for 90 percent of jobs and more than 80 percent of the GDP in the developing world. 19 Within the private sector, small- and medium-sized enterprises (SMEs) can be engines of job creation. Although definitions of an SME and estimates vary, figures from the ILO (using 99 employees as a threshold for SMEs) show that 35 percent of formal private enterprise employees worked for an SME in 2016.20 Other estimates suggest SMEs account for more than 50 percent of employment worldwide and 60 to 70 percent in OECD countries.^{21,22}

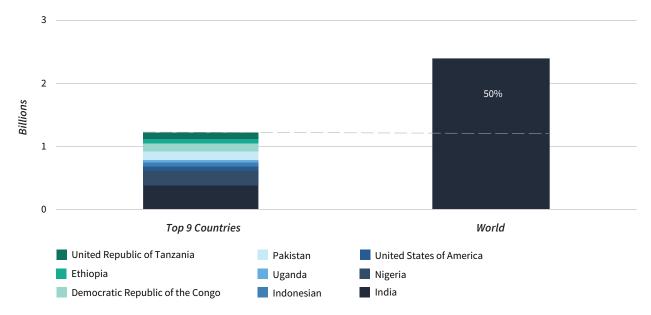
However, there are countries that are experiencing "jobless growth," with even educated youth unable to find jobs. In India, only 17 percent of college graduates are employable and only 2.3 percent have undergone formal training, yet more than half of India's population is under the age of 25.23 Likewise, the top concern among Nigerians is the lack of job opportunities: between 2010 to 2030 some 40 to 50 million jobs will need to be created in order to accommodate a rising youth population.^{24,25}

Creating an enabling environment for the private sector to grow is fundamental for generating jobs and perhaps it is time to rethink industrial policy by targeting key sectors in each country. At the same time, we need better jobs, and economic growth needs to be inclusive, that is, "distributed fairly across society and creating opportunities for all."26 Thus, upgrading education systems and skilling the workforce will not be enough.

CHALLENGE 2

EXPLODING POPULATION GROWTH

Part of the challenge is that economies are unable to generate enough decent and productive jobs to keep pace with population growth. According to UN projections, the global population is expected to increase dramatically in the next 30 years, from 7.3 billion in 2015 to 8.5 billion in 2030 and 9.7 billion in 2050.27 More than half of the growth between 2015 and 2050 is expected to occur in Africa, while Asia will remain home to the largest population in the world with 5.2 billion people by 2050 (Figure 3).^{28,29} Half of this growth will be concentrated in nine countries: India, Nigeria, Pakistan, Democratic Republic of the Congo, Ethiopia, United Republic of Tanzania, the United States, Indonesia, and Uganda (Figure 2).30



▲ Figure 2 Total Population Growth between 2015-2050

In less than five years, India will be the most populous nation in the world; while many Asian countries are aging, India is projected to be the youngest country in the world by 2020. Nigeria is predicted to be the third most populous country by 2050, surpassing the United States, with 30 percent of its population between the ages of 15 and 24.³²

The proportion of youth is also predicted to grow in certain regions. Currently, there are around 1.2

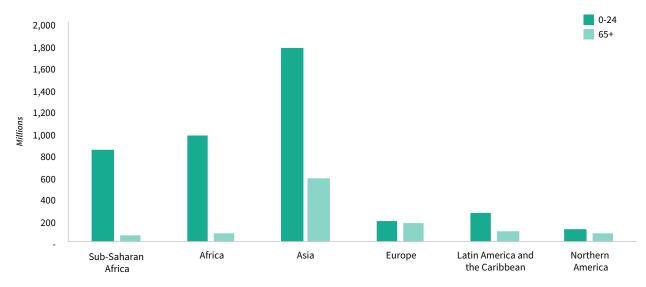
▼ *Figure 3:*Population Prediction in the World and Major Regions (millions)

Source: LIN DESA33

billion young people ages 15 to 24 globally, with the majority concentrated in Asia.³⁴ By 2030, it is estimated that there will be 1.3 billion youth worldwide: 711 million of them will live in Asia and more than 300 million in Africa.³⁵ Africa will be the continent with the fastest growth in youth population over the next 15 years (Figure 4).³⁶

The anticipated growing number of youth populations presents opportunities and challenges. Countries with larger working-age populations have the chance to capture the "demographic dividend," benefitting from a labor force that is growing more rapidly than the dependent population (children and elderly). The potential this presents for increased savings, productivity, and investment in economic development and family welfare can give way to increases in per capita in-

	2015	2030	2050	2100
World	7,349	8,501	9,725	11,213
Africa	1,186	1,679	2,478	4,387
Asia	4,393	4,923	5,267	4,889
Europe	738	734	707	646
Latin America and the Caribbean	634	721	784	721
Northern America	358	396	433	500
Oceania	39	47	57	71



▲ Figure 4 Population Projections by Region and Age Group for 2030

Source: UN DESA³⁷

come.³⁸ Nonetheless, the growing youth bulge can also present challenges: many developing countries with high youth population growth rates are struggling to provide healthcare, food, education, and meaningful employment opportunities.³⁹

An exploding youth population without economic opportunities may have global implications in the form of increased insecurity, migration, and economic challenges. There is a link between youth bulges, unemployed youth, and violence.40 Youth who are unable to engage fully in the labor market can become targets of international gangs or terrorist groups or recruited as child soldiers. Also, young people are the population most eager and willing to migrate to countries with better economic opportunities.41 Promoting economic development and work opportunities will be the key to make them a productive generation within their countries, contributing to the economy. Appropriate labor policies, investment in human capital, and social protections are necessary in this regard.

Young people possess tremendous potential and are optimistic about the future. The Global Youth Wellbeing Index—which involved a survey of youth from 30 countries accounting for nearly 70 percent of the world's youth population—indicates that young people are enthusiastic about the future:

they want to acquire the skills needed to get the jobs they desire.⁴² Yet youth too often lack the opportunities to tap into that potential.

At the same time, the global population over 60 years of age is also expected to reach more than double its current size by 2050 and more than triple by 2100.⁴³ Currently, almost 1 billion people (or 12 percent of the global population) are over 60 years old.⁴⁴ Europe has the largest share of this population group, but Asia and Africa will have the same aging population proportion as Europe in the coming years (around 25 percent).⁴⁵ By 2050, developing countries will be home to 80 percent of the global aging population.⁴⁶

Brazil's 111 million workforce is undergoing a demographic shift that will have repercussions for the job market. The fertility rate in Brazil fell below the replacement level in the mid-2000s-this slow population growth trend will continue. Currently, Brazil's old-age dependency ratio is about 7 workers for every pensioner, but it is projected to fall to 2.8 workers for every pensioner by 2050.47 This means that there will be fewer workers to support an aging population. 48 The declining entrants into the labor market means that retirement systems will be strained if not properly managed. Similarly, there are now escalating concerns regarding Kazakhstan's aging population, which now comprises more than 7 percent of the country's total population. 49,50 Kazakhstan's total dependency ratio (i.e. the number of dependents for every 100 working adults) has increased from 44.6 in 2010 to 53.7 in 2017.51,52

A lack of jobs can make people more entrepreneurial or more aggressive.

—Senior Nigerian labor economist

Though its total population is not decreasing, at present, Kazakhstan's relatively constant birth rate is projected to steadily decline over the next few decades while average life expectancy is forecasted to increase.⁵³ According to the UN Population Prospects, Kazakhstan's elderly population (ages 65+) will double from 6.78 percent of the country's total population in 2015 to 13.2 percent of the population by 2050.⁵⁴

The increase of an aging population will likely create more demand for medical and social care.55 Countries with a high dependency ratio will find aging to be a disruption to economic growth. As the population shifts from working-age into retirement, this older population is more likely to need additional health resources and assistance. On average, global expenditures on pensions and other benefits for older populations account for 6.9 percent of GDP.56 Without an income, the elderly become more dependent on the state and will rely on limited state services to support them, in effect, putting a greater burden on the working population. In addition, it is possible that populations will have to work to older ages to avoid poverty, thereby amplifying the need for job creation.

CHALLENGE 3

YOUTH VULNERABILITY

Youth have big hopes and ambitions for the future; moreover, they possess the enthusiasm and potential to contribute in meaningful ways to the economic growth of their communities and countries. However, these hopes and ambitions are often stifled: of the nearly 200 million people unemployed globally in 2016, 35 percent were youth (between 15 and 24 years old).⁵⁷ Moreover, technological development has encouraged the expansion of more flexible

working arrangements—especially for youth—where jobs are less secure and less protected.⁵⁸

The statistics suggest that youth unemployment is significant, but this masks another issue: many youth, even the educated, are underprepared to tackle current labor market needs. A cadre of young people are not in education, employment, or training (NEET) and are often unemployable due to a lack of opportunities and resources.⁵⁹ Often, it's not a choice. In Nigeria, there were more than 4 million unemployed post-secondary graduates in 2017.⁶⁰ In the Middle East and North Africa (MENA) region, youth unemployment stands at 31 percent yet university graduates make up nearly 30 percent of the total unemployed pool.⁶¹

Graduates are struggling to find jobs that meet their expectations and many are underqualified to fill their desired positions because of a lack of jobready skills that can include not only technical and industry-specific skills, but also soft skills (like communication, teamwork, and problem solving) that employers increasingly value and require. Youth might receive a diploma, but that does not guarantee they have the right skills for the job. In many countries, the current education system and skills training are not in sync with the needs of the current labor market.

CHALLENGE 4

INFORMALITY AND LOW-QUALITY JOBS

Informality, working poverty, and underemployment remain the main labor market challenges in many developing countries. 63 The informal economy refers to all economic activities by workers and economic units that operate outside the formal reach of labor law.⁶⁴ People in informal jobs often lack contracts, legal protections, employee rights, and employment benefits. Informal workers are often characterized as having low productivity and low income. Even if economies produce jobs. these tend to be of low quality. Of the total global employed population (around 2 billion people), more than 60 percent are informally employed.65 The incidence of informality is more prevalent in developing countries, which account for 93 percent of the world's informal employment.66 For



▲ Vendors sell vegetables at a street market in Phnom Penh on September 18, 2018.

Source: TANG CHHIN SOTHY/AFP/Getty Images

example, in India, almost 90 percent of the total workforce is informal. The informal sector is very heavily delimited by social structures—with caste, class, gender, and religion all playing a key role. In Nigeria, more than 65 percent of employment (more than 20 hours per week) is informal and the majority of the new jobs being created are in the informal economy.

Poverty is both a cause and a consequence of informality. Countries with higher informality tend to have low levels of development and low income per capita.⁶⁷ Informality is inversely correlated with education.⁶⁸ The poor mostly have low levels of educational attainment, with no option or opportunity to enter the formal sector.⁶⁹ Moreover, informality is twice as high in rural areas than in urban areas. Given that most economic activities

in rural areas are linked to the agriculture sector, it is not surprising that informality mostly exists in this sector.⁷⁰

Youth, women, and the most vulnerable groups in societies (by race, caste, and disability) are more likely to be informally employed. The Women in the informal economy are mostly found in unpaid childcare and domestic work or in low-quality jobs that are home-based that allow them to tend to their household responsibilities. Nearly 91 percent of women in the informal economy are illiterate or have only finished primary education.

Informal employment has been the only avenue for income for many people in precarious situations, absorbing some of the failures of the formal economy. Recognizing that there are different limitations to formalizing all informal workers, the thrust of policy should be to improve the earnings and well-being of people. One way to improve the livelihoods of informal employees is to address financial inclusion—mobile money and electronic payments allow people to connect to new markets



▲ An employee works in a mobile phones assembly line 17 September 2004, at Manaus Duty Free Zone (ZFM) in the Amazon, north Brazil.

Source: EVARISTO SA/AFP/Getty Images

and promote new business opportunities. When people use these platforms and make electronic transactions, they become easier to track for tax records and gain easier access to credit and other opportunities. In India, the recent demonetization drive, the "Make in India" initiative, the national "Goods and Services Tax" (GST), the drive towards digitization, and "bankification" are all attempts at decreasing the pertinence of the informal sector.

CHALLENGE 5

PERSISTENT GENDER GAPS AND INCOME INEQUALITY

Among disadvantaged groups, women still face significant challenges in the labor force. Globally, women are less represented in the labor force and are concentrated in less productive economic activities, with low earnings, long hours and—as mentioned previously—in informal arrangements.⁷⁴ Men outnumber women in most occupations and in high-level positions.

Between 1998 and 2008, there was a major shift in women's employment participation from agriculture to the service sector. Overall, the service sector is the largest employer for women, while industry and extractive sectors (such as mining) do not tend to hire women.⁷⁵ Despite the shift to services, many women still work in agriculture in sub-Saharan Africa and Southeast Asia and the Pacific, often in informal settings.⁷⁶ Other sectors where women are represented include agribusiness, tourism, textiles, and clerical work.⁷⁷

A key challenge for a country such as India is to incorporate women more productively and inclusively in the economy. It's also notable that India is one of the few places where women with more education have lower rates of employment. India has one of the lowest women's labor force participation rates in the world, and it keeps declining. In addition, India is one of a small number of countries where women with secondary education have lower employment rates than women with less than primary-school educations. Economists have argued that the labor participation rate for women in India follows a "U-shaped" curve in relation to economic development and education. Many explanations have been brought forward for

this trend, such as a family income effect (more educated women marrying better-off husbands and thus withdrawing from the labor market) and the unavailability of suitable jobs for moderately educated women. This trend has been more pronounced in rural areas.⁷⁹

Barriers for women in the workforce include cultural restrictions, discriminatory company policies, wage inequality, inadequate maternity leave, the absence of care services, and unequal access to financing. ⁸⁰ Legally, women can also be restricted to obtaining jobs in certain sectors such as mining and construction or from owning property. ⁸¹ Additionally, cultural expectations lead many women to drop out of school at a young age to marry and bear children. Often, a lack of education coupled with domestic responsibilities and childcare limits women's ability to find quality work.

Yet, women earn an average of 70 to 80 percent less than men for similar work.⁸² In terms of entrepreneurship, only 34 percent of firms in developing countries are owned by women.⁸³ Women also tend to own smaller firms in terms of sales, assets, profits, and employees.⁸⁴

These earnings dipartites give way to greater income and wealth inequality, which has become a hot topic both in advanced and developing countries. Income and wealth inequality have been rising in advanced economies, with a concentration of income and wealth in the richest group (the top 1 percent).85 In developing countries, inequality is relatively high. Yet the inequality trends are ambiguous depending on the indicators used to measure inequality and the type of data collected (household surveys versus administrative tax records). Income inequality in developing counties as measured by the Gini coefficient has declined from 1988 to 2011 (but again, remains at high levels) and is predicted to decrease further.86 Other studies using tax records data show a more mixed outcome: inequality has increased in some countries since 1980 (such as Russia, China, and India) while in other countries it has remained stable or declined slightly (since 1990, the Middle East, sub-Saharan Africa, Brazil, and to a lesser extent, Latin America and the Caribbean as a whole).87 The main concern is the potential of technology to exacerbate existing social and economic inequalities via automation and the polarization of skills and wages.

WORLD OF WORK IN DEVELOPING COUNTRIES FUTURE DRIVERS AND TRENDS



eveloping countries have current unresolved problems in the quantity and quality of jobs created and will be impacted by the onset of technological change and new disruptions to the workforce. Economies will need to create quality jobs and, at the same time, help citizens adapt to these disruptions. While old challenges remain, developing countries are also facing new challenges including technology, globalization, migration, environmental challenges, and changing demographics. This section presents the main future forces impacting the world of work.

All countries will face technological disruptions that have the potential to increase economic efficiencies and generate new types of jobs, displace workers and exacerbate existing inequalities. Some regions will experience growing youth populations, which will put pressure on economies to create jobs and on education systems to prepare future workers. Africa, for example, will be the continent with the largest youth population growth: the United Nations predicts an increase of more than 100 million youths (ages 15-24) between 2015 and 2030. Other developing countries will age quickly and will need to take steps to ensure that their retirement systems are fiscally sustainable and that their social safety nets and health services can respond to the needs of the elderly.

The way we work is also undergoing a transformation. In developing countries, traditional employers like the government and the manufacturing sector have been in retreat for some time. Many workers in developing countries have never had a traditional employer-employee relationship, since they work in the informal economy. They may be self-employed or do several "gigs" to make a living. In this regard, the "gig economy" that is under debate in Western countries has been present in the developing world for some time.⁹⁰

Moreover, jobs with routine and repetitive tasks will likely become automated and people will be pressured to move, both occupationally and geographically. In order to remain employed, people will have to incorporate training and skills development throughout their lives. Learning will be ongoing and take place in different settings beyond school or university—what experts call "lifelong learning." In the future, "work" and "training and learning" will not be distinct stages like in the past, but will be interconnected.⁹¹

DRIVER 1 TECHNOLOGICAL CHANGES

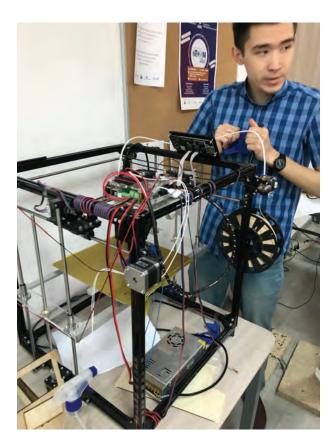
Much of the discussion of the future of work centers on rapid and repeated technological disruptions and associated job losses. This rapid technological transformation—the 4IR—includes AI, blockchains, big data, and others. There are concerns that these technologies will destroy jobs, increase income inequality, and create higher numbers of contingent workers. The 4IR is expected to disproportionately reward owners of capital and highly skilled individuals. Jobs, typically those consisting of a repetitive set of manual tasks easily substituted by machines, will be threatened.

Despite these threats, technological advancements are also known to have important economic benefits: in the first half of the twentieth century, for example, technical progress accounted for 80 percent of U.S. economic growth.94 The latest innovative technology can generate new employment opportunities via digital platforms and more flexible work arrangements. It can also bring about improvements in productivity that allow cheaper delivery of goods and services and increase savings to free people to pursue paths of entrepreneurship.95 However, there are concerns that this new technological revolution differs from previous ones in its speed (leaving less time for workers and societies to adjust leading to job losses as well as a massive redefinition of the skills needed for existing jobs) and impact (namely, increased inequality). 96 The most intense and concerning debate of the 4IR is the potential for new technologies to replace rather than complement humans in the labor market—not just in physical work but also in cognitive work.

While automation does have the productive capacity to replace humans in some forms of work – for example, through self-check-out at the grocery store and automated assembly lines in factories – it is not a threat that will impact every sector in the same way. There are different estimates of the impact of automation on jobs displacement and these estimates have been revised over time. There are varying results depending on region, especially if broken down by occupation, task or activity. What these numbers show is that: i) there is a great uncertainty on how automation will impact jobs and ii) some initial estimates might have overblown the risk of automation. 98

Most occupations have been affected by automation and the 4IR will continue to affect all occupations to different degrees. Jobs that require primarily physical and repetitive tasks have a higher likelihood of being automated and are therefore most at risk. 99,100 Tasks that require specialization like research and development, design and creativity, and managing people are less likely to be negatively impacted by the 4IR. Additionally, the importance of the "human touch" in many services cannot be overstated. While many of the tasks service industry workers complete could be automated, many consumers prefer the human-to-human interaction that a machine cannot replicate, a preference that will determine the extent to which services become automated.

For developing countries, absorbing these new technologies will not be a straightforward process. For example, the Economist Intelligence Unit surveyed 25 countries to assess their ability to automate and found that developed countries are better prepared for automation than their developing country counterparts. ¹⁰¹ Factors such as wage levels, availability of skilled work-



▲ A student working on a 3D printer in Kazakhstan.

Source: Chris Metzger

ers, technology cost, regulatory barriers, and others affect the pace of technology adoption. McKinsey concludes that it will take India "two decades or more before automation reaches 50 percent of all of today's work activities." In Brazil, McKinsey's research estimates that technically half of employees' input in Brazil could be automated, with manufacturing, transportation, and warehousing as key sectors with the highest potential for automation. However, if the costs and benefits of automation and regulatory and social issues are factored in, then only 14 percent of such Brazilian jobs could be displaced by 2030. 104

Jobs will not disappear overnight, jobs will evolve as workers begin using new technologies in all industries. Our four country case studies show four interrelated trends in technology adoption: i) the pace of technological adoption overall will be slow; ii) governments and the private sector are aware of future disruptions and are not blocking technological change; iii) for the most part, governments do not have a strategy for the future of work and education systems lag behind, failing to prepare the workforce of the future; and iv) the private sector is taking the lead on the topic. For example, India's trade associations have adopted their own skilling initiatives, including NASSCOM, the largest information technology (IT) trade association (Box 1).¹⁰⁵

RE-SKILLING INITIATIVES IN INDIA¹⁰⁶

NASSCOM recognizes the potential of future technologies like 3D printing, blockchains, robotics, and others and the impending disruption of the labor market. To address the global technology talent shortage, NASS-COM seeks to further India as the world's technology skills hub through initiatives like their FutureSkills program. FutureSkills acts as an industry utility that aims to reskill/upskill approximately two million technology sector employees over a five-year period. FutureSkills focuses on 10 emerging technologies, 66+ job roles, and 155+ skills. Through skilling in big data analytics or artificial intelligence, participants can be trained to become data architects and business intelligence analysts. Cybersecurity training can enable more tech sector employees to move up the job ladder as networking security consultants. Over 200,000 users participate in NASSCOM programs that include over 30,000 content pieces from over 30+ partners (including Microsoft).

Around the world, some governments have started taking steps to strategize about technological change. Fifteen countries have adopted AI national strategies in the past two years, including China and India. 107 India wants to promote its AI strategy with a unique brand #AIForAll aiming to use AI as a transformative technology for the economy in healthcare, agriculture, education, smart cities and infrastructure, and smart mobility and transportation. But India also wants to ensure that AI is used for the "greater good" and the economic impact of AI is socially inclusive. India wants to become an "AI Garage" to developing countries, that is, a playground for companies and institutions to develop solutions that can be replicated and scaled up in the rest of the world. ¹⁰⁸ In Brazil, some state and local governments have adopted "innovation strategies", to attract companies and talent to the technology sector.

In the private sector, a survey by Deloitte shows that 31 percent of companies are in the process of implementing artificial intelligence (AI) and robotics, 34 percent are piloting selected areas and only 10 percent say they are either fully automated or highly advanced in this area. ¹⁰⁹ Interestingly, only 20 percent of companies say they would reduce the number of jobs while 77 percent will either retrain people to use technology or will redesign jobs to better take advantage of human skills.

DRIVER 2 GLOBALIZATION

Closely related to technology, globalization will also continue to affect workplace environments. Globalization has certainly benefitted U.S. companies. For example, U.S. exports accounted for 13 percent of U.S. gross domestic product and supported approximately 11.5 million U.S. jobs. And American workers in export-intensive manufacturing industries earned on average, 15 percent to 20 percent more than their counterparts in other manufacturing industries.¹¹⁰

Technology and openness to trade have facilitated the fragmentation of the value chain between production and service delivery in a variety of sectors such as textiles, footwear, food, and tourism, among others. Companies have been able to divide the stages of production across various countries, expanding their supply chains globally and impacting the structure of economies in their source countries. Beginning with



▲ In this photograph taken on December 8, 2016, an Indian technician inspects components on an assembly line of Highly Electrical Appliances India Pvt. Ltd. at a company air-conditioner compressor plant at Matoda, some 20 kms. from Ahmedabad.

Source: SAM PANTHAKY/AFP/Getty Images

the extraction of materials in one developing country, to refining, manufacturing, shipping and packaging in others, it ends with the final stage of selling to consumers. This process of offshoring production and outsourcing to different suppliers throughout the global value chain to developing countries has allowed companies to reduce labor costs and increase productivity. This has been responsible for the creation of 450 million jobs worldwide, many of them in developing countries. 112 Since the early 1990s, global supply chain-related jobs in emerging markets have increased from 19 percent of total employment to 25 percent of total employment in 2013.113 Services have also been subject to this offshoring wave. An example is the call centers for customer service established in countries like the Philippines or India where labor is cheap and workers speak English, or business process outsourcing (BPO) services in Central America and other Western hemisphere countries that take advantage of the time zone and geographic proximity to the United States.

The recent wave of automation and robotics has shifted the discussion about "reshoring" (or onshoring) activities back to developed countries. Reshoring is the term used to describe the reintegration of global supply chain processes into developed countries rather than exporting them to developing countries. There is still little actual evidence on large scale reshoring, but benefits could include reduced transportation costs, just-in-time production that reduces surplus inventories that must be sold at a discount, product quality improvement. The short of the discount of the product of the product

Nearshoring is another term used to describe the trend of cutting the geographic length of supply chains without returning all the way to the home country. For example, U.S. companies are moving parts of their supply chains from East Asia to Mexico, saving on transportation costs.

The magnitudes of nearshoring and reshoring are uncertain, but they will have implications for the future of work and global production. Globalization and trade networks will continue to be important for developing countries and will impact their labor markets. As the ILO notes, trade and technology combined open the question of whether manufacturing-led growth is still a viable strategy for developing countries or if they should focus on highly productive segments of the service sector instead. ¹¹⁶

DRIVER 3

INCREASING URBANIZATION AND THE RISE OF THE MIDDLE CLASS

The world is rapidly urbanizing: more than two-thirds of the global population is expected to live in urban areas by 2050.¹¹⁷ Most of this urban growth will take place in developing countries. Africa's urban population alone is expected to increase from 40 percent in 2017 to 56 percent by 2050; in Asia, the urban population will increase from 48 percent in 2017 to 64 percent by 2050.¹¹⁸ The rapid growth of cities in developing countries will also place a huge strain on local economies to produce adequate jobs, food, infrastructure, and public services for their citizens.

Populations that are migrating to cities are doing so to fulfill their aspirations and to receive higher incomes. Many people are moving to cities because of the availability of jobs or aspirations for better work. Numerous studies have shown that working in urban settings offers nearly double the payoff of working in rural areas. The World Development Report 2019 estimates that an additional year of work experience in the city can increase earnings by 2.2 percent. Improving social inclusion will be an important aspect of handling rising urbanization. Adequate infrastructure and public services will be needed for the citizens and to drive growth in businesses.

The middle class will also expand dramatically worldwide, particularly in Asia. ¹²¹ By 2030, the size of the middle class globally is expected to reach 5 billion, up from 3 billion since 2009. ¹²² Asia's share of the global middle-class is predicted to increase from 28 percent in 2009 to 54 percent in 2020 and 66 percent in 2030. ¹²³ The size of the middle class will have profound implications for spending patterns, creating more demand for goods and services and placing pressure on food systems. This will potentially provide more economic growth and generate jobs for citizens and investment opportunities for companies.

DRIVER 4

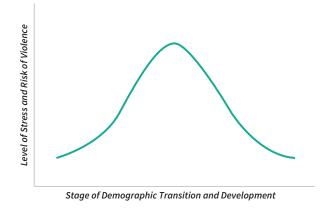
DEMOGRAPHIC TRANSITIONS

Alongside technology, globalization, and urbanization, the composition and mobility of the workforce is also undergoing a rapid transformation. Overall,

people are living longer and healthier lives (Figure 3). Since 1950, life expectancy has increased by 10 years in most regions of the developing world and fertility rates have declined dramatically, except in sub-Saharan Africa. ¹²⁴ For countries in sub-Saharan Africa and the Middle East, the youth population will make up more than 30 percent of the population for the next 10 years. ¹²⁵

In order for countries to reap the future "demographic dividend" (i.e., the economic opportunity provided by a higher working-age population relative to dependents, namely, children and the elderly), this transition needs to be properly managed. 126 A growing youth population can put pressure on the labor market and will require deliberate focus to ensure youth are educated and skilled — both with technical skills demanded by specific industries, but also trained in soft skills that can supplement any other skill set.

It is important to note that as countries experience this demographic transition (i.e. from high birth and death rates to lower birth and death rates) from a traditional to a modern society, they can undergo tremendous stresses. These stresses include contact with the global marketplace and culture, urbanization, environmental degradation and decreased food availability, growing income inequality, growing ethnic competition, and religious extremism. When plotted against development, these stresses follow an inverted-U relationship, becoming most dangerous midway through the demographic transition



▲ Figure 5 The "Inverted U" Relationship

Source: Global Ageing Institute¹²⁹

	LIFE EXPECTANCY (YEARS)		TOTAL FERTILITY RATE (BIRTHS PER WOMAN)		YOUTH BULGE (AGE 15-24)		AGING POPULATION (AGE 65+)		MEDIAN AG (YEARS)		POPULATION (MILLIONS)		POP. GROWTH RATE
	2015	2030	2015	2030	2015	2030	2015	2030	2015	2030	2015	2030	2015- 2030
BRAZIL	74	78	1.8	1.7	21%	16%	7%	13%	31	37	208	229	0.6%
INDIA	67	72	2.5	2.1	26%	21%	5%	8%	27	31	1,311	1,528	1.0%
KAZAKHSTAN	69	71	2.6	2.3	20%	23%	6%	10%	29	32	18	20	0.9%
NIGERIA	52	57	5.7	4.7	34%	34%	2%	3%	18	19	182	263	2.5%
DEVELOPING WORLD AVERAGE	70	73	2.6	2.4	23%	21%			29	32			1.1%

▲ Figure 6 Demographic Transitions in Four Case Study Countries

and development process (Figure 5). A major challenge to address will be ensuring the demographic transition does not go the wrong way for countries like India and Nigeria so their demographic dividends are actualized (Figure 6).

DRIVER 5 MIGRATION

Countries with large youth populations and a lack of meaningful work opportunities have a greater risk of emigration. In Northern Africa, the Northern Triangle of Central America, and Syria, countries flooded with civil conflict, instability, and slow economic growth, people face a life-altering choice to stay or go. Other countries are experiencing increased emigration of highly skilled and unskilled workers who leave to pursue more economically rewarding opportunities abroad. Although these migrants provide resources in the form of remittances (i.e., money sent to their families back home), emigration impacts the economic progress of home countries. It is important that these countries enact policies that will retain their population and provide suitable job opportunities for citizens of every education level. At the same time, for those people who decide to leave in search of better opportunities abroad, countries ought to help them do so through legal channels and try to enact incentives to bring them back.

Host countries also face challenges in integrating these individuals into their societies both economically and culturally. Hosting large migrant populations can also take a toll on the local economy and resources: overcrowded cities that lack public services to sustain this influx of individuals and a lack of jobs to absorb the migrant population. The challenge of the international community is supporting states that are ill-equipped to deal with the existing migration crisis.¹³¹

Approximately 20 million Africans live outside their countries of origin. As of 2009, 5 million Nigerians lived abroad, having moved for better economic opportunities. Nigeria has also attracted migrants from other African countries: more than 600,000 foreigners reside in Nigeria, mainly from West Africa.¹³² In 2014, the Nigerian government enacted a National Policy on Labor Migration with the support of the International Organization for Migration (IOM) and the ILO. The policy aims to better manage labor migration to and from Nigeria through three components: promoting good governance of labor migration, protecting migrant workers' welfare, and optimizing the benefits of labor migration on development while mitigating its adverse impacts. 133

DRIVER 6 ENVIRONMENTAL FACTORS

Environmental factors like natural disasters (e.g., droughts, floods, intense heat waves) and water



▲ An aerial view of houses in peat swamp areas in Merang, during an aerial tour of the Sumatran forest taken by Greenpeace and South Sumatra Governor, Alex Noerdin on December 10, 2010 in District Musi Banyuasin, Palembang, South Sumatra, Indonesia.

Source: Ulet Ifansasti/Getty Images

and air pollution will have repercussions for the world of work in terms of the supply of and demand for workers. In terms of the supply of labor, food or water shortages will create human displacement. Sectors like agriculture are disproportionately affected by environmental fluctuations and in the many developing countries and local markets that depend on agriculture for jobs, these fluctuations can have a devastating impact on rural communities. Other threats like extreme weather events have the potential to displace many from their homes. Due to extreme weather-related events in Nigeria, the Fulani herdsmen are forced to move their cattle into agricultural areas and as a consequence disrupt local crop production. At the same time, efforts to reduce negative environmental impacts and adapt existing jobs to more environmentally-friendly practices can lead to increased job opportunities. New types of work such as "green jobs" (e.g., in renewable energy) and jobs in sustainable agricultural production are some examples. 135



echnological changes, globalization, environmental challenges, and demographics will continue to disrupt the world of work. Economies will need to create meaningful employment opportunities for growing youth populations. Education systems will have to be upgraded to better prepare the workforce for the coming disruptions. But upgrading education systems and skilling the workforce will not be enough considering the countries that are experiencing "jobless growth," where even educated youth are unable to find work. Creating an enabling environment for the private sector to grow is fundamental for generating jobs. Economic growth needs to be inclusive, that is, fairly distributed with opportunities for all citizens. 136

Managing the future of work challenges will require responses from individuals, governments, educational institutions, and companies on several fronts. In this section, we discuss three areas of action:

- 1. Developing countries will need to focus on creating meaningful work opportunities for all (beyond "highly skilled" jobs), that is, more and better jobs to meet the aspirations of the growing youth.
- 2. Developing countries will need to invest in workforce development to help people better prepare for the changes to come, focusing on a "lifelong learning approach" from childhood to adulthood;
- 3. Developing countries will need to provide social systems to help the workforce adapt and adjust to different transitions—occupational transitions, income transitions, and health transitions.

IN DEFENSE OF WORK CREATING MORE AND BETTER WORK OPPORTUNITIES

A job can be a way out of poverty and a pathway to sustainability, but a job has broader purpose than the income gained: it is a source of personal fulfillment, social interaction and freedom, and creates We can either play defensive, put a break on change and the solution for tomorrow's world of work is to go back to what we had yesterday because that felt safer, and nicer, and more stable. Or else you can embrace change, go forward and basically say, 'tomorrow's world of work is going to look and feel different and we need to manage change'...the future is what we make of it...it starts today.

-Guy Ryder, ILO's Director General

positive externalities in the economy via more cohesive societies. The right framework needs to be implemented to create the environment for the private sector, and SMEs in particular, to flourish and create meaningful job opportunities.

Given the increase in automation and the large numbers of working poor, some scholars have proposed a universal basic income (UBI), enabling all citizens of a country to receive a sum of money, regardless of their income, resources, or employment status.¹³⁹ UBIs can either deliver the same amount of funding to the entire population or use a Negative Income Tax (NIT) that "provides benefits to lower-income beneficiaries through the tax system, with 'tapered' benefits gradually declining as incomes rise." At this point in time, UBIs are still widely considered experimental; the only country that has implemented a UBI, Mongolia, ended its program after two years because of fiscal constraints. Finland is also conducting a pilot and gathering evidence on the system that will run until the end of 2018. Canada's Ontario province just ended its UBI experiment abruptly.

There is value to considering workable UBI programs, but it is doubtful that they would supplant the social function that "work" brings to people. Work is not just a matter of generating income for oneself and the household; it provides a sense of belonging, worth, and social benefits beyond monetary gain. Thus, economies need to create more and better work opportunities, even with the disruptions taking place. We cannot simply give up on work.¹⁴⁴

Many new jobs will be needed in the future and creating an enabling environment for the private sector is a first step. An enabling environment for private sector growth includes political stability and economic predictability (sound macroeconomics), infrastructure investment, creating inclusive, smart, and well-balanced regulations, and upholding the rule of law and controlling corruption. According to the World Bank Enterprise surveys, the top three obstacles for companies operating in developing countries include access to finance, practices of the informal sector, and political instability. 147

The role of governments is to create an enabling environment and implement policies that help achieve development objectives and goals such as job creation. Governments in developing countries will also have to put more focus on playing a

larger role in guiding technological change, making economies more innovative, and supporting sectors that create jobs. This will require deliberate and proactive government interventions, technology, and innovation and industrial policies. Job creation in developing countries will require an enabling environment and a long-term strategy and a comprehensive set of policies for countries to innovate and diversify their product base, goods, and especially services. Education and training will also serve a long-run transformational function in developing people's skills and capabilities to support diversification, innovation, and job creation.¹⁴⁹

SECTORS THAT CAN PROVIDE OPPORTUNITIES FOR WORK

Many developing countries are becoming service economies without having first developed a strong manufacturing sector, a trend some have termed "premature de-industrialization." The shift from manufacturing to service economies is due to globalization and technological progress; this means that developing countries will likely not experience the same industrialization and job creation processes as developed countries. At the same time, many developing countries rely on agriculture as the main employer to sustain people's livelihoods. In sub-Saharan Africa and South Asia, agriculture still employs roughly 57 percent and 43 percent of the population respectively (2017). 152

It is hard to predict how many jobs will be created in the future in different sectors and occupations. One popular estimate is that 65 percent of current schoolchildren will be working in jobs that do not exist today. Countries differ in terms of technology adoption, economic and demographic structures, openness to trade and investments, and human capital, all of which will shape future



▲ In this photo taken on January 10, 2017, interns work at start-up company Hacklab.in in Bangalore. In the basement of a Bangalore building, hundreds of young Indians sit in neat rows of desks typing furiously, all dreaming of becoming the new Steve Jobs or Mark Zuckerberg.

Source: MANJUNATH KIRAN/AFP/Getty Images

employment trends. However, some sectors offer higher potential to employ substantial numbers of people in the future. In the four countries we surveyed, these sectors include infrastructure, information and communications technology (ICT), food production, healthcare, tourism, entertainment, the faith industry, education, and the green economy. Some sectors have the potential to create further jobs through backward and forward linkages, meaning they depend on other sectors for their output or services (for example, food production and retail). While capacity to offer jobs in quantity matters, the value added (or productivity) of the sector also matters, not just the overall employment per sector.¹⁵⁴

The sectors below have the potential to contribute needed jobs in the developing world:

Infrastructure: Infrastructure spending is badly needed in developing countries where approximately 1.1 billion people live without electricity and 2.1 billion people lack access to safe drinking water. According to estimates of the Global Infrastructure Hub, to meet the United Nations Sustainable Development Goals (SDGs), investment needs to increase from 3 percent of global GDP to 3.7 percent of global GDP between now and 2030, at a total cost of \$97 trillion. Infrastructure serves as a means for more efficient trade for local, regional, and international business activity.

Although infrastructure requires large capital investments in terms of equipment, machines, and tools, it is also an avenue for job creation in the developing world. Globally, the sector employs 100 million people contributing \$10 trillion in annual revenue (6 percent of global GDP) and the sector has the potential to hire more people in the future. ¹⁵⁶ However, one key challenge the sector is

facing is a talent gap. Aging negatively affects the industry because as the existing workforce shifts out of work, no one is filling the void. Generally speaking, youth are not interested in pursuing careers in construction because of low wages and social stigma, and with a potential rise in the supply of infrastucture jobs, there could be an employment gap. Moreover, this is a predominately male-dominated industry.¹⁵⁷

ICT and Digital Platforms: Internet technologies are providing new opportunities for professional work. This is a wide sector encompassing jobs associated with the software industry, application developers, Internet of Things, expansion of internet and broadband penetration, e-commerce, and digital platforms. Digital platforms for freelancing, the sharing economy, the gig economy, and e-commerce offer earning opportunities for white-collar and blue-collar workers alike in the informal and formal economies. Digital labor platforms provide work to software developers, creative and multimedia professionals, sales and marketing professionals, and data operators, among others. Tech start-ups are also growing in importance. Sharing economy platforms (Uber) and e-commerce spaces (Amazon) can offer income generating opportunities for many people. However, it is important to note that while such platforms can provide new income opportunities, the jobs that are created can be precarious and low-quality without rights or benefits for the workers providing the service.

Food Production and High Value-Added Agribusiness: Population growth means that more people will need to be fed, while a growing consumer class with changing tastes is signaling demand for different foods. New technologies can be deployed to make food production more efficient and diverse. Associated services such as storage, food safety, marketing, packaging, and advertising are being deployed to entice consumers and offer them a greater variety of choices. Emerging economies in Africa have a growing middle class and there is opportunity to expand their food choice, creating growth in the sector.

DYNAMIC UGANDA MARKETSYSTEMS APPROACH¹⁵⁸

DYNAMIC is a project led by GOAL and funded by the Mastercard Foundation that began in 2015 to support disadvantaged youth by providing skill-building opportunities, access to financial services and markets that will enable them to find entry-level jobs or pursue entrepreneurial interests in agricultural value chains. Engagements with private sector actors have proven beneficial to train, mentor and purchase agricultural products from youth. Additionally, it has benefitted private sector actors who were able to sell more and buy back more produce by engaging with youth.

The Care Economy: The "care sector" constitutes labor that provides for the needs of the elderly, children, and ill or disabled persons and includes industries like domestic work, primary and secondary education, health care, and mental health. ¹⁵⁹ Robots and machines will not be able to fully replace social and human interactions. According to the UNDP, of the 20 occupations least likely to be replaced by machines, 14 were jobs in the care sector. ¹⁶⁰ Moreover, due to population growth, aging, and lifestyle changes, there will be high demand for care services around the world.

In education, although distance learning institutions and Massive Open Online Courses (MOOCs) have proliferated, the growing population will still create demand for teachers at the early childhood, primary, secondary, and tertiary levels. UNESCO estimated that 69 million teachers will be needed both in primary and secondary schools to achieve universal primary and secondary education by 2030; of those, 20 million will be additional teachers while 49 million will replace teachers who retire.¹⁶¹

With a growing aging population and technological advancements in modern medicine that have helped



▲ SHONGA, NIGERIA: Female farmers raise their hoes in solidarity with the Zimbabwean farmers, 08 July 2005 during the first planting of the Kwara Agricultural project at Shonga.

Source: PIUS UTOMI EKPEI/AFP/Getty Images

increase life expectancies, there will be an expanding need for both sophisticated tertiary healthcare services and for support services and palliative care. Some forecasting models predict that by 2030, the healthcare sector will double the demand for current workers to 80 million jobs. 162 With aging populations especially in East Asia and Latin America, services dedicated to the elderly such as nursing homes, nurses, and chore workers will be in high demand. However, many developing countries have a deficit of trained care workers, many of whom migrate and send remittances back home. In countries like the UK, the ratio of nurses to population is 847 per 1,000; in countries like Zimbabwe and Nigeria (two of the largest exporters of care workers), the ratio is 129 per 1,000 and 66 per 1,000, respectively. 163 The global total of nurses, physicians, and midwives is 34 million; in sub-Saharan Africa they total 1.2 million. The number of care workers will need to increase drastically to fulfill the demands of the expected 1.5 billion people in sub-Saharan Africa by 2030.¹⁶⁴ The focus of care work in sub-Saharan Africa is not on increased demand for elder care; rather, it is mostly an increase in long-term care demands for populations affected by disease pandemics.¹⁶⁵

Moreover, in recent years, non-communicable diseases (NCDs), such as cardiovascular diseases, diabetes, chronic obstructive pulmonary diseases, and cancers have been on the rise in developed and developing countries alike. These diseases commonly found in advanced economies are now prevalent in most developing countries, creating a double disease burden alongside infectious diseases.

The prospective rise of the middle class and aging populations combined with the emergence of chronic diseases in developing countries has created more demand in healthcare. The healthcare delivery model and workforce requirements will undergo a significant transformation with a shift to primary care at the community level. Primary care is the main entry point to health services for most people in resource-limited places. Given its success in tackling communicable disease in developing countries

such as HIV, tuberculosis, and malaria, primary care is suitable for preventing and controlling other diseases. 168 Primary care can be supplied for both prevention, non-invasive treatments, and post-surgical care. 169 Well-trained staff are needed in primary care since they take over responsibilities from specialists such as screening, prevention, follow-up, and referring patients to specialized and multi-disciplinary teams of physicians. Thus, task-shifting is a crucial issue for assuring the quality of primary care. However, there has been a shortage of healthcare workers in developing countries particularly in Asia and sub-Saharan Africa. Out of 47 countries in sub-Saharan Africa, 11 countries have no medical schools and 24 countries have only one medical school.¹⁷⁰ International migration of health workers also exacerbates regional shortages. This provides an opportunity for developing and developed countries to enter into partnerships to train health care workers and encourage a more "circular" migration, that is, with trained workers returning to their countries of origin.¹⁷¹ This sector in particular will need a coordinated effort on credentialing and recognizing internationally standardized methods in healthcare.

Moreover, obesity, stress, and sedentary lifestyles are some of the health risks impacting developing and developed countries alike. One-third of the world's population is now overweight, with 62 percent of overweight people living in developing countries. ¹⁷² In 2016, 39 percent of adults aged 18 years and older worldwide were overweight and 13 percent were obese, with the worldwide prevalence of obesity nearly tripling between 1975 and 2016. ^{173,174} The global community faces health challenges that will demand preventative services, such as healthier diets and exercise, as well as palliative services such as weight loss and other health-related services. This is an area that can provide job opportunities for many workers.

Travel, Tourism, and Hospitality: Travel, tourism and hospitality employs mainly youth with different skill levels. It is one of the fastest-growing industries in the world, contributing in total 10.4 percent of the global GDP (\$8.2 trillion) and responsible for 1 in every 10 jobs and 6.5 percent of all services exports worldwide. It encompasses both leisure and business activities such as sightseeing, cultural experiences,

entertainment venues, conferences, and others. It also generates even greater employment and income in other sectors such as construction, transportation, and agriculture. By 2028, the industry is forecast to contribute 11.7 percent of GDP (\$12.4 trillion) and generate 413.5 million jobs. Yet it is an industry that relies on some preconditions, such as good infrastructure and a stable political environment.

Entertainment: Arts, music, media, TV, and movie production rely on personal interaction, human creativity, and imagination. This sector reached revenues of \$2 trillion in 2017 and is expected to continue growing in the future. 1777 Examples include Nollywood in Nigeria, Bollywood in India, and the telenovela industry in Brazil. Within the entertainment industry, there is room for growth as a result of technological advancement. Entertainment will always be a desired societal and cultural component, but it has taken different forms over the years as different platforms and capabilities have emerged. In animated or action films, new technology has enabled enhanced entertainment services that will require advanced technological literacy and software editing capabilities to achieve the desired effects and features.

Worship and Faith Industry: Religious institutions play a major role in developing countries, providing employment, schooling, medical insurance, and even credit to families. They also support the graphic and print industry. In the secular west, religion has taken on less importance, so its value and place in daily life in developing countries is often underestimated or overlooked. 178 In sub-Saharan Africa, faithbased organizations in some countries provide on average around 50 percent of social services. 179 Religious affiliation is projected to be nearly 90 percent by 2020 around the world, with 9 in 10 people adhering to a particular religion. 180 Many nonprofit religious organizations in developing countries often have higher pay scale than in developed countries, and in addition, they do not require higher education to secure a job. 181 For example, large churches in Nigeria can employ on average 2,000 people. One of the largest churches, the Living Faith Church, has more than 6,000 branches across Nigeria and around the world and employs more than 18,000 people in Nigeria alone. 182,183

Green Jobs: 184 Some of the future job creation potential will stem from the transition to a more environmentally sustainable future, through energy efficient technologies and renewable energy. There are many definitions of green jobs. The ILO and UNEP in 2008 defined them as "as any decent job that contributes to preserving or restoring the quality of the environment whether it is in agriculture, industry, services or administration."185 These are jobs that reduce consumption of energy and raw materials, limit greenhouse gas emissions, minimize waste and pollution, and protect and restore ecosystems. 186 Green jobs can provide 15 to 60 million additional jobs globally over the next two decades by enhancing resource efficiency and building low-carbon sustainable societies. 187 At least half of the global workforce—approximately 1.5 billion people will be affected by the transition to a greener economy mainly in eight key sectors: agriculture, forestry, fishing, energy, resource-intensive manufacturing, recycling, building, and transport. 188 This will lead to new jobs but also the destruction of existing jobs, with a net effect of positive job creation. Moreover, studies show that this transition will require workers to update skills instead of completely retraining workers for new occupations. 189 For example, workers already employed in the oil and gas industries have the level of educational attainment to transition to clean energy; this is an opportunity to prevent major job loss from the transition of economies away from fossil fuel energy. The key will be to offer workers support via income, retraining, and relocation assistance.

From the case studies, both Kazakhstan and Nigeria, which are oil-dependent economies, have begun to think about the transition to greener economies. For example, several companies operating in Nigeria are helping to diversify the energy supply through solar panel installation and funding support. ¹⁹⁰ Such job opportunities include renewable energy production, installation, and maintenance.

PREPARING THE WORKFORCE FOR THE FUTURE

RETHINKING LEARNING

Technology, globalization, and environmental forces will create new jobs, destroy some jobs, and force other jobs to change. Current generations will find themselves working in occupations that do not currently exist, and the big unknown is what kind of skills these occupations will demand. As mentioned, some estimates suggest that 65 percent of school-children will work in jobs that do not exist today. 191 Additionally, the youth of today are raised in a different world than that of previous generations, and their job expectations and interests may not be as linear in an increasingly globalized and technological world. 192 Workers will need to gain new skills to adapt to changing labor market demands. Yet, there are several concerns surrounding the level of skills in developing countries: 193

- Presently, there is a mismatch in the labor market: current education and training systems are not delivering the necessary skills for current labor market needs.
- A concern over polarization of jobs: the creation of more high- and low-skilled jobs with a decline in middle-skilled jobs.¹⁹⁴ The ILO predicts a risk of job polarization in developing countries.¹⁹⁵ New technologies can exacerbate existing inequalities.
- A good number of existing workers, especially mid-career and older workers, need to be reskilled now. Furthermore, employers and educational institutions should connect on the possibilities to improve lifelong learning opportunities to prevent a backlog of older workers from having outdated skill sets. 196
- The future workers entering the labor market will need new skills: not only is there a need to address current skills demanded in the labor market, but educational institutions (technical and vocational institutions and universities) have to be prepared to adapt to and keep pace with the changing skills demands of the labor market. 197
- Companies in developing countries, especially small- and medium-sized enterprises (SMEs), need help identifying current and future skills required in their respective sectors.¹⁹⁸
- Educational institutions need to have recognized credentials to validate the skill sets that people develop. This includes creating creden-



▲ A Senegalese farmer on a tractor ploughs soil as part of an agricultural project in the village of Djilakh, 80km south of Dakar, on April 22, 2008.

Source: GEORGES GOBET/AFP/Getty Images

tialing platforms through educational institutions that are accessible and nationally and internationally recognized.

• There is a need for data-sharing of labor market trends to transparently show the skills that employers are seeking and in what job families they are needed.

Skills of the Future

Changes in the different sectors are impacting the types of skills demanded in the labor market. For example, digital technology is creating new types of work through online platforms. These jobs require IT knowledge, business acumen, and organizational skills. Some sectors that are either new or growing such as renewable energy, travel and tourism, and healthcare demand more workers with a variety of

skills. Language proficiency, computer use, collaborative abilities, critical thinking, and problem-solving are in high demand in a more interconnected world. At the same time, certain human qualities cannot be supplanted by robots and machines, such as human touch, personal relationships, and creativity.

Moving forward, skills in programming, interacting with robotics, and artificial intelligence (AI) will have to be acquired. From a technical angle, there is increasing pressure to encourage students to enter STEM-related fields in virtually every sector due to technological advances. 199 Many surveys suggest the important skills of the future will include non-technical skills like cognitive and socio-emotional skills such as problem solving, emotional intelligence, creativity, resilience, and adaptability-human skills or "soft skills" that machines are unable to replicate (Box 4).200,201 Individuals who are adaptable to new circumstances and have the ability to re-learn will probably be more successful in responding to labor market needs since the nature of jobs will be in constant change.202 Moreover, experts point out that com-

WHY ARE SOFT SKILLS VALUABLE?²⁰³

- Soft skills prepare youth for uncertainty because they foster a growth mindset and equip youth for frequent reskilling. Soft skills are important for "learning how to learn."
- Soft skills include "work readiness" skills that employers increasingly demand—including communication, team work, and crisis management, among others.
- Soft skills are transferable and relevant to multiple jobs in various industries—these skills are timeless.
- Soft skills supplement other more technical skills sets. Employers want well-rounded employees with not only technical skills, but also more foundational soft skills.

bining several skills in innovative ways will add value to work performance. The role of citizens will be to approach learning as a lifelong activity to advance their economic interests and to participate wholly in society.

The educational system and private sector are vehicles to ensure continual renewal in the labor force. The labor market of the future will depend on the ability of institutions (the private sector, education systems, unions, intermediaries, NGOs, and government) to adapt to the needs of youth and changes in workforce demands. The skills of the future will rely on the effective interlinkage of these entities to expand the access to and quality of training in developing countries. Although we cannot predict the future with certainty, educational institutions, the private sector, and citizens will need to adopt a lifelong and dynamic approach to learning. Individuals will need to take responsibility for their continual learning and governments will need to ensure access to quality education.

You cannot wait until a house burns down to buy fire insurance on it. We cannot wait until there are massive dislocations in our society to prepare for the Fourth Industrial Revolution.

—Robert J. Shiller,2013 Nobel Laureate in Economics

Creating an Employment Ecosystem

Education is the foundation of any society: it prepares people to live cohesively in a community, to participate politically, contribute to society, and gives them the tools to prepare for future employability.²⁰⁴ Early childhood education, that is, education before primary school, is the first place to invest, with the most significant return in the long-run.²⁰⁵ Investing in the first "1,000 days" of children's lives, according to the World Development Report (WDR) 2019, is the "most cost effective and equitable investment governments can make." Many children are exposed to adverse conditions, including malnutrition, unsafe environments, and poverty, and these early childhood education programs can foster resilience and competence in children.²⁰⁶ However, early childhood education is unaffordable for many parents in developing countries.²⁰⁷

There have been great advances in schooling: since 1950, the average duration of schooling has gone from 2 years to 7.2 years.²⁰⁸ Moreover, school enrollment for girls has increased since 1990.²⁰⁹ Yet, the quality of schooling remains a challenge. As the WDR 2018 states, "schooling is not the same as learning." Children and youth are not attaining essential reading, writing, and math competencies and these learning shortfalls have negative repercussions for youth entering the workforce. Curricula need to be relevant to labor market needs, advance the aspirations of the individual, and match stu-



A young Afghan girl attends one of the thousands of community based schools supported by the United Nations Children's Fund (UNICEF) to make formal education accessible to children.

Source: LIN Photo/Roger Lemovne

dents with realistic career trajectories. Curricula and classroom design will need to adjust to a modern learning approach that integrates existing and future skill demands. It is important for countries to create an "employment ecosystem" where all the key players are part of the conversation—for example, ensuring that the private sector (which creates jobs) is connected to training institutions (to prepare youth with the skills the labor market demands).

In terms of tertiary education, universities and technical and vocational education training (TVET) programs need to be reassessed moving forward.²¹⁰ These systems are sometimes very rigid and force students to choose between either university education or TVET programs.²¹¹ Vocational training, especially apprenticeships, faces persistent stigmatization when

No country can really develop unless its citizens are educated.

—Nelson Mandela

compared to a traditional university education path.²¹² Societal attitudes towards vocational training and trades need to change. One way to address this already in practice in the United States involves creating programs within secondary schools that align with labor market needs. Such programs can target and attract students interested in a particular field and teach them a set of skills needed to pursue a career in that field. Companies like Volkswagen, Tesla, CVS, Electric Boat, and others are modernizing programs in secondary schools because these programs can help strengthen and expand the pool of prospective employees in a tight labor market.²¹³ On the other hand, programs like this often groom or tailor students to a particular company and restrict students from exploring other possibilities.

CHEVRON TVET PROGRAM IN THAILAND²¹⁴

Chevron is currently in its fourth year of a five-year project in Thailand, which aims at improving education outcomes in STEM and strengthening the TVET system to develop a skilled workforce that supports Thailand's economic competitiveness. The project, Enjoy Science, is also enhancing the government's capability to deliver on its signature Thailand 4.0 policy, and has already improved learning outcomes for over 108,000 vocational students at the end of year three of the project, exceeding the original target of 94,904 students.

A few key takeaways that make this program successful include:

Enhancing TVET learning by investing in professional development for teachers in 60 targeted TVET schools: The program improves the capacity of teachers, master trainers, and school administrators from the Office of Vocational Education Commission (OVEC), under the Ministry of Education, through professional development workshops, ongoing mentorship, and provision of new teaching tools, techniques and materials to facilitate student acquisition of technical and 21st century skills needed by industry. The program partners with Activate Learning—a leading US publisher of STEM materials—to procure and localize international best practices. The program also partners with a premier Australian TVET institution to identify areas necessary to build semiskilled, skilled and knowledge workers.

Establishing TVET hubs throughout Thailand to serve as facilitator: Establishing collaborative partnerships among government, industry, and schools. The hub model establishes centers of knowledge and training that can scale the model to enhance more technical students' and teachers' understanding of skills required by the key industries.

Assessing project impacts through a third party international evaluator: Assembling a team of expert faculty members and researchers to monitor and evaluate the impact of the program helps to maintain the integrity of the project and to regularly collect and analyze data across several indicators to track progress.

EDUCATION FOR EMPLOYMENT (EFE) HOSPITALITY AND RETAIL TRAINING IN JORDAN²¹⁵

EFE has implemented soft skills training with TVET institutions throughout the MENA region, combining these with social media campaigns that work to change people's mindsets and eliminate the stigma attached to certain occupations.

In Amman, Jordan, EFE is managing the Abdali Mall Recruitment and Training Center (AMRTC), a five-year project that began in 2016. The Abdali mall is the largest in Amman, and its construction was financed by the European Bank for Reconstruction and Development (EBRD). EBRD required that the mall develop a training center to be operated by a third party in order to service the community. The EBRD hired workers to manage the procurement process of securing a manager for the center, and EFE Jordan was selected to operate and manage the center for a period of five years. Managing this center provides EFE Jordan with access to every employer operating in the mall and its connected hotel, allowing it to better penetrate the hospitality and retail sales sectors.

In 2018, EFE Jordan was also awarded management of the training center for the AYLA project in Aqaba. The AYLA training center provides EFE Jordan with access to a number of employers in the retail and hospitality sectors in southern Jordan, as the resort includes a number of hotels, restaurants, retail shops, and a golf course, among other amenities.

Since 2016, EFE Jordan has trained more than 325 youth for placement in jobs with employers at the mall and within the AYLA project in the hospitality and retail sectors.

Vocational training is seen as a second best to a university degree: that needs to change.

—Guy Ryder, ILO'S Director General

Mid-career workers and adults have different outlooks and interests. For them, education has to be tailored to their lifestyles, work schedules, and their learning capabilities (for example, shorter training courses or mid-career training courses that can be done in the workplace).²¹⁶ Access to education can be facilitated through new apprenticeships and onthe-job learning programs targeted to the adult population. Moreover, online platforms such as massive open online courses (MOOCs) are booming.²¹⁷ These offer flexible and accessible courses with skills development programs, but they are not a perfect fit for all learners even in developed countries. Additionally, online learning faces specific challenges in developing countries in terms of credentialing standards for courses. There are also segments of the population who cannot benefit from MOOCs since they still have problems accessing reliable electricity and broadband internet. These issues will need to be addressed in order to improve opportunities to skill and reskill the workforce for the future.²¹⁸

The different components of lifelong learning—early childhood education, basic education, tertiary, and adult education—are all important, but the issue will be how to prioritize interventions: what should be the focus for countries? What is the right role of government policy and funding? What is the role of the private sector? This will depend on the country and regional conditions, including the demographic path that the country is on, its available resources, and other factors.

Providing Better Information on Skills Requirements

The critical role of and connection between education systems and employers will be in aligning identified needs of employers to educational institution offerings and facilitating the transition from school to work. Linking the private sector with education systems and public employment services (labor exchanges) has been found to be something that is needed in the four countries CSIS analyzed. Curricula will need to be more balanced between providing a basic foundation in a wide set of skills and being tailored toward skills that are aligned with labor market needs, with a focus on filling the gaps in the marketplace.

More than 42 percent of youth report that their main obstacle to finding a job is a lack of experience.²¹⁹ Employers will be increasingly called to provide workbased learning via apprenticeships, internships, or other on-the-job training. The gap between the demands of employers and the skills of prospective employees will require more participation and investment in skilling from the private sector. According to World Bank enterprise surveys, 34 percent of firms in developing countries offer training to their workers.²²⁰ This gap will need to be addressed by providing schools, businesses, and training institutions with regular information on skill requirements and demands within the job market now and in the future.

In addition to young employees, an important issue mentioned earlier is the re-skilling of older workers. As jobs change due to the use of new technology, existing employees will require on-the-job training. Surveys indicate that many companies would prefer to retrain their workers instead of simply replacing them.²²¹ A key issue will be how to incentivize the private sector to offer training, given that workers are changing careers faster and frequent staff turnover will be the norm.²²² The current generation of workers will probably have shorter employment periods with any given company than previous generations, and employers will therefore question the returns on training.

DESIGNING FUTURE SOCIAL PROTECTION PROGRAMS

Managing the future of work challenges will require strengthening safety nets and social protection systems (Box 6) to help provide protections for workers, help them transition through different stages of life, and increase job quality. At present, only 45 percent of the world's population is effectively covered by at least one social protection benefit.²²³

DEFINITIONS

Social Safety Nets (World Bank): Safety nets are basically income maintenance programs that protect a person or household against two adverse outcomes: a chronic incapacity to work and earn, and a decline in this capacity caused by imperfectly predictable lifecycle events (such as the sudden death of a breadwinner), sharp shortfalls in aggregate demand or expenditure shocks (through economic recession or transition), or very bad harvests. Safety net programs serve two important roles: redistribution (such as transfers to disadvantaged groups) and insurance (such as drought relief).²²⁴

Social Protection (ILO): involves access to health care and income security, particularly in cases of old age, unemployment, sickness, invalidity, work injury, maternity, or loss of a main income earner.²²⁵

One key area that has received a lot of attention in the debate of the future of work is the need for social protection systems to help the workforce adapt and adjust to different transitions-occupational transitions, income transitions, and health transitions. Safety nets are important outside of transitions, too, especially for workers who are in precarious or vulnerable employment situations. Transformations in the world of work, aging societies, and increasing inequality will create demand for better social protection systems.²²⁶ Social protection and safety nets are an integral component of a society's ability to take care of specific groups of citizens and confront specific risks. Social safety nets take the form of cash transfers, in-kind transfers, social pensions, public works, and school feeding programs, all of which have had substantial impacts on poverty reduction.²²⁷

Developing countries face a high degree of informality in the labor market, so many workers do not contribute to nor receive benefits from the system. They may be self-employed or do several "gigs" to make a living. In a democratic country, the political reality is that it's nearly impossible to remove or cut back on these programs once they are in place, therefore it's critical to design a system that is not only effective but also sustainable in the long term.

-Daniel Runde, Forbes 2016

Since jobs will be transformed and low-skilled, routine jobs will be automated, workers will need time to adjust, and this will require some form of income supplement and re-skilling. Added to that, governments in developing countries need to increase their capacity to mobilize revenues to fund these systems.²²⁸

These changes that are happening require a rethinking of the type of social protection systems that are needed for workers and the kind of safety nets for vulnerable populations.

Currently, a large portion of the population in developing countries lacks adequate coverage of retirement, health insurance, and other benefits, since they are outside a formal employer-employee arrangement. Many workers are in informal contracts or are self-employed, so their contribution capacity is not captured by current systems. The "gig economy" era has added working arrangements that are more flexible and uncertain, doing part-time or freelance work, and holding multiple jobs at the same time.

Some population groups have better social protection coverage than others. In Africa, only 5.6 percent of unemployed populations have effective social protection coverage, this is the least protected population group. Similarly, unemployed populations in the Americas are the least protected population group with 16.7 percent



▲ An elderly woman waits to see a doctor at North Wing's Hospital in Brasilia, 11 December 2007.

Source: EVARISTO SA/AFP/Getty Images

having adequate coverage.²³⁰ In Asia and the Pacific, 9.4 percent of those with severe disabilities have effective social protection, the lowest in the region.²³¹

Governments, companies, and other stakeholders in developing countries need to work together to design social protection programs that can help citizens weather workforce changes. Some tools currently under discussion are universal basic income, portable benefits, and programs that reskill vulnerable groups.

A Universal Basic Income (UBI): The level of payment of UBI programs and the effect they can have on benefits from other social safety programs is highly debated.²³² Simulations of UBI implementation in some emerging economies have been calculated to cost about 3.75 percent of GDP.²³³ The World Bank has also estimated that "the cost of a UBI for adults set at the average poverty gap level ranges from 9.6 percent of GDP in low-income countries to 3.5 percent of GDP in upper-middle income countries."²³⁴ Financing for UBI programs will have to originate from a combination of sources such as taxes and other contributions. Some propose taxing robots, new technologies, or capital

owners in general to fund this and other social protection programs. 235

Those who support UBIs argue that they can mitigate the damage of technology-related job displacement and help reduce poverty and inequality.²³⁶ Proponents also argue that UBIs would reward new forms of work that the market has previously ignored, such as unpaid care work.²³⁷ Critics of the UBI approach question its feasibility as a tool for reducing inequality and poverty, believing it would not be able to provide an adequate income and would replace other social safety net benefits. Other concerns revolve around employers' responses, which could be to reduce wages or disengage from collective agreements.²³⁸

Taxing Capital and Reskilling: With the 4IR underway, as workers are laid off due to automation and artificial intelligence, Bill Gates has floated the idea of a tax on non-human employees—a "tax on robots." This "tax on robots" would force companies that use robot workers to pay income taxes or pay a tax for replacing a worker with a robot.²³⁹ This tax would compensate for a loss of fiscal resources and fund other types of employment.

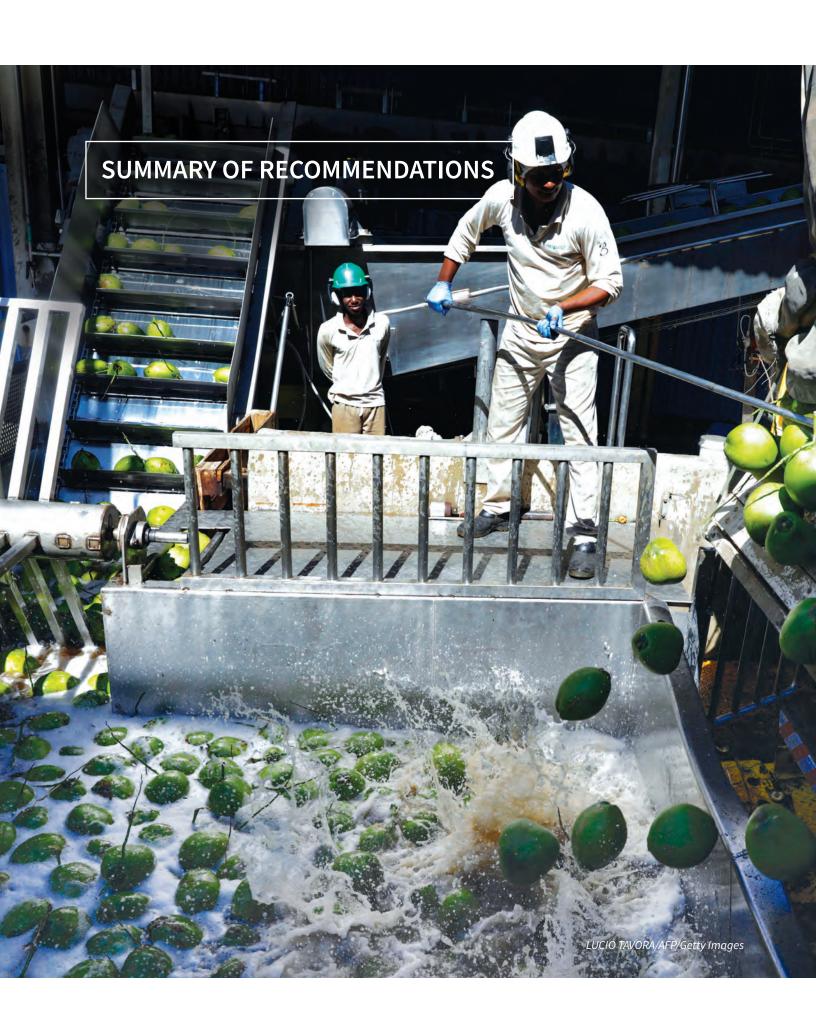
Although taxing robots is a novel idea, currently, employers and government institutions are more focused on reskilling the labor force so that workers can compete in an ever-more-demanding labor market. This particularly applies to older workers, who have

specific sets of skills for jobs that might not exist anymore. It will be important for governments and the private sector to work together to design and fund re-skilling programs especially for workers in the later stages of their careers.

Freelance platforms, such as Uber, Lyft, and TaskRabbit, have become alternatives to traditional "jobs." However, these jobs are not suited to everyone: it is difficult to transition from a well-paid, skilled form of work, to an on-demand, less lucrative position at a late stage in a career.

Portable Benefits: Given that workers are poised to change jobs more frequently going forward and perhaps shift to more contractual work arrangements, the concept of instituting portable benefits has attracted attention. These benefits are not tied to a particular employer, effectively "delinking" social benefits from labor contracts.²⁴⁰ Portable entitlements have the double advantage of offering continued protection to workers and at the same time facilitating transitions and mobility between jobs.²⁴¹ Similar to UBIs, this is an incipient initiative. In the United States, states such as Washington, California, New York, and New Jersey are evaluating the introduction of portable benefits.²⁴²

In developing countries, this portability function could be extended to self-employed workers and workers in the informal sector who often lack any social protections, especially related to retirement or health insurance. If a digital ID system is implemented, governments could promote the use of self-employment accounts so that even informal workers can contribute to a self-funded account.²⁴³ For individuals who cannot pay into these accounts, contributions could be subsidized with financing from general taxes.²⁴⁴



anaging the future of work challenges will require responses from individuals, governments, educational institutions, non-government and civil society organizations (CSOs), and companies on several fronts. Given the demographic and technology challenges, economies need to create more and better jobs. They also need to think about education and skills and rethink what learning means. Safety nets and social protection systems will need to meet the needs of the twenty-first century to help workers transition through different stages of their working lives.

In this concluding section, we present a summary of the main recommendations drawn from the four county case studies we conducted. Some recommendations focus on labor market processes and strategies for job creation. Others touch on workforce development, training and education. The main challenge will be to prioritize policy interventions so that countries are not confronting an overwhelming task, but one focused on key areas that can have strong labor market impact.

RECOMMENDATION 1 **DESIGN A STRATEGY ON THE FUTURE OF WORK**

Many of the stakeholders consulted in these four countries are aware of labor market disruptions, but there is not adequate preparation to meet the challenges, and there is no broad stakeholder dialogue or coordination on the issues surrounding the "future of work." A more holistic vision of the world of work in each country is needed, bringing together different stakeholders into a regular dialogue or forum. It is important to include all players in the employment ecosystem in the conversation, including governments, companies, industry associations, unions, education systems, youth

groups, and NGOs. The countries will need to prioritize interventions since there are many areas that require attention. For example, in skills and training, revamping all education levels is important, but should countries focus on early childhood education or reskilling the adult population? Should more funding be allocated to teacher training or to digitizing schools? Or to setting up vocational education institutions and university tracks? This forum could design a "World of Work" strategy to guide the country's action for the coming decade. It would target different areas that need reform and sectors that have a high potential for creating more and better jobs. The strategy would be complemented by ongoing dialogue sharing best practices and facilitating learning from failures.

RECOMMENDATION 2

IMPROVE THE UNDERSTANDING AND MAPPING OF FUTURE SKILLS BY SECTOR

The future workers entering the labor market will need new skills, and individuals, the private sector, education systems, and governments will have to work together to meet these changes. The workers of the future will rely on the effective interlinkage of these entities to expand access to and quality of training in developing countries.

It is not easy to define and predict what future skills will be most in demand, but several tools help inform the discussion of anticipated skills demand. These range from quantitative methods such as econometric models to qualitative methods such as roundtables, employer surveys, and focus groups, or a combination of both.²⁴⁵ These methods are prevalent in advanced economies and could be adopted in developing countries to better inform stakeholders about what future skills will be required. Companies and CEOs in developing countries, especially small- and medium-sized

enterprises (SMEs), often do not know how to go about identifying and thinking through the current and future skills needed in their respective sectors. The multilateral development banks can be instrumental in helping developing countries adopt some of these techniques.

Developing countries' experiences can be shared as well. For example, in India, different trade associations are undertaking their own skilling initiatives. These trade associations and skills councils could set up working groups to exchange ideas, training approaches, best practices, and key lessons learned for their programs. These insights could be transmitted to governments and educational institutions to inform and form a more robust "skilling ecosystem" for a twenty-first century workforce.

RECOMMENDATION 3

REDESIGN CLASSROOMS IN SCHOOLS TO FOSTER COLLABORATION AND ACTIVE PARTICIPATION AMONG STUDENTS

Aside from technical knowledge, many educational experts highlight teamwork, adaptability, flexibility, and critical thinking as fundamental skills in the new world of work. Investments in basic education must focus on breaking traditional models of content and syllabus, and fostering interactive and engaging institutions. New models of teaching must focus on encouraging teamwork and building cognitive and critical thinking skills while supporting creativity and flexibility at the same time.²⁴⁶ Schools need to foster an active learning environment and not be just a lecture setting. Classroom design can help in that pursuit. This can be done inexpensively by rearranging desks into islands or circles (instead of putting some students in the front and others in the back in rows facing the teacher) to foster greater collaboration. Displaying student projects as wall décor can inspire other students to be creative while at the same time giving them pride in their work. Establishing areas where children can post their ideas, read, or celebrate accomplishments can also be instrumental in creating a more collaborative learning environment. Other arrangements such as letting students sit, stand, and kneel throughout the time they spend at school are some of the inexpensive adjustments that can be made in classrooms for students to really enjoy going to school and instill a desire to learn and be able to acquire those skills that are needed in the workplace.²⁴⁷

RECOMMENDATION 4

PROVIDE TEACHER TRAINING PROGRAMS IN BASIC EDUCATION TO FOCUS ON TWENTY-FIRST CENTURY SKILLS

It is important that governments work to strengthen the systems that provide and deliver quality teacher training programs to ensure basic and secondary education level literacy, numeracy, science, and civic understanding among all youth. This is the foundation for new work. Training programs need to focus on skills and attitude development including critical thinking, teamwork and collaboration, problem-solving, and creativity. In addition, girls disproportionately drop out or are discouraged from attending school for reasons such as safety concerns, cultural expectations, and infrastructure barriers. While teacher training cannot fix these issues alone, it has a role to play in reversing cultural expectations in the classroom. Therefore, teacher training could include techniques that encourage and motivate girls at school through specific measures such as debates, Q&As without humiliation, and offering them opportunities to be team and project leaders.

RECOMMENDATION 5

PROMOTE TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET)

In many countries, TVET programs are an important component to tertiary education that act as a strong alternative to a four-year degree. TVET programs can provide support to engage youth in a clear career path. If done well, TVET programs can offer strong networks for apprenticeships and provide qualification frameworks that are typically designed to impart in-demand skills aligned with the job market.²⁴⁸ Yet TVET programs face social stigma. Parents often make career choices for their kids and are averse to sending their kids into trades, like in the construction and agriculture sectors. More information on trade and technical and vocation training programs needs to be communicated in secondary schools.

Given the stigma attached to technical and vocational training, youth are sometimes unaware of or do not consider the job opportunities that TVET can provide. TVET training centers and employers should develop better strategies for reaching out to young people with information. Advocacy will be important in eliminating existing biases against TVET programs. This will help re-orient the perception of TVET and make it more attractive to young people.

TVET initiatives are underway. Nigeria's development agenda from 2009, Vision 2020, had a heavy focus on education as an important component for national growth, and prioritized technical and vocational education and training (TVET) investments.²⁴⁹ The International Youth Foundation (IYF) has implemented a "Passport to Success" soft skills training in Kazakhstan (and other places), working with local TVET colleges, universities, and training centers.²⁵⁰

Brazil has developed a vocational training system that still exists today to provide high quality education and skills that can transfer into the job market. Brazil's flagship program, PRONATEC, trained nearly 8.8 million people between 2011 and 2014.^{251,252} PRONATEC is part of a system of federal government institutions that help advance the mission of TVET programs. The system of institutions is referred to as the "S system" in Brazil, and it consists of the National Industrial Training Service (SENAI), the National



▲ Students participating in "Fab Lab Atryrau" STEM courses in Kazakhstan.

Source: Chris Metzger

Transportation Training Service (SENAT), the National Rural Training Service (SENAR), the National Commercial Training Service (SENAC), and others. The system has 2,800 vocational training institutions and trains more than 700,000 people annually across Brazil to prepare the next generation for the evolving demands of the workforce.²⁵³ While Brazil's TVET programs have many beneficial characteristics such as short-duration courses that result in employability and productivity, some limiting factors of the system include a lack of basic education and a disconnect with private sector needs.²⁵⁴ Coordinating with the private sector will be a key strategy for matching training programs directly with job needs and company interests while also linking youth directly to jobs via career guidance and training. This will require creating a series of collaborative councils of government, business, schools, and other interested actors at national, state, and local levels.

RECOMMENDATION 6

PROVIDE YOUTH WITH BETTER GUIDANCE ON JOBS, CAREERS AND OPPORTUNITIES THROUGH CAREER SELF-ASSESSMENTS AND CAREER COUNSELING IN SECONDARY EDUCATION

Self-assessments can be valuable information sources for youth who are figuring out their strengths and what they would like to do for a living. Many career decisions are still driven by family choices that associate status and a "good career" with traditional degrees such as IT, engineering, business, and medicine. However, aspirations are misaligned with the market needs. Education systems, particularly career guidance counselors, need to be trained to provide an organized, step-by-step career preparation strategy that connects students with up-to-date online resources, job search platforms, and self-assessments that will give clear guidance on what they need to do before entering the job market. Counselors also need to have access to data from employers on the necessary job training, in-demand skills, and experience that students are required to have in a particular field before matching youth with job opportunities.

In India, for example, less glamorous industries such as automobile manufacturing, textiles, construction, and machine operations are not facing worker shortages²⁵⁵ Starting in secondary school, self-assessments could help youth in their career choices, while schools could provide students with more information on the needs of industries, wage levels, skills, and characteristics of different occupations to change their perceptions of what a good career means.

RECOMMENDATION 7 MODERNIZE PUBLIC JOB PLACEMENT AGENCIES

Labor market intermediation or labor exchanges refer to those institutions and mechanisms that connect job seekers with employers. These are cost effective systems that can reach a lot of people though digital technologies. Since 1959, India has hosted a National Employment Service that consists of a network of 966 employment exchanges run by the

state governments.²⁵⁶ In Nigeria, in 2014, the Federal Ministry of Labour and Employment of Nigeria established a public employment service, the National Electronic Labour Exchange (NELEX), as an electronic platform to facilitate job exchange and labor mobility.²⁵⁷ Brazil has a public employment exchange (labor market intermediation system) via the SINE, which helps to match people with jobs.

However, there are some shortcomings that need to be addressed, since these exchanges have not been as effective in matching job seekers with positions. The exchanges could be improved through:

- Better advertising and outreach about the existence of these systems, especially in poorer areas, for example through job fairs.
- Connecting different subnational exchanges into one online platform to provide greater flexibility to citizens of the country regardless of location.
- Linking these exchanges to private platforms such as LinkedIn and others, learning from their experiences.
- Offering integrated and modernized services that include candidate registration, career assessment and counseling, job matching, training, and apprenticeships.
- Linking candidates to private sector employers (not just government jobs) and introducing modern methods and technologies.
- Publishing data on the types of jobs and skills employers seek, the duration of vacancies, and linking the service with technical and vocational education and training (TVET) programs to enhance the functioning of the labor market and provide a signaling tool in terms of the wages, types of occupations, and level of education that the labor market is demanding.
- Improving funding for the systems. For example, in Brazil, the SINE receives 2 percent of overall federal spending (not including state spending) on active labor market programs (i.e., government programs designed to increase employability), while OECD countries spend 10 percent on average.²⁵⁸

• Coordinating and forming partnerships with employers in the private sector so that there are better links with the type of skills and jobs that the private sector is seeking.

RECOMMENDATION 8

CONTINUE INVESTMENTS IN QUALITY INFRASTRUCTURE TO ENHANCE PRODUCTIVITY AND TO CREATE JOB OPPORTUNITIES

A significant component of countries' growth and productivity will depend on quality infrastructure. In the four countries CSIS analyzed, there are large infrastructure gaps that are not only big obstacles for companies, but also hamper children's ability to learn or attend school. The focus should be on access to reliable electricity (Nigeria), broadband access (in all four countries visited), and transportation (especially in Brazil, Nigeria, and Kazakhstan). In India, subpar water and sanitation services impede children's ability to learn.

Inaccessible drinking water, hygiene, and sanitation are three of the largest underlying causes of absenteeism in schools in developing countries, responsible for the loss of more than 440 million days of school each year.²⁵⁹ Ensuring access to water and sanitation is crucial for retention as well as the long-term impacts on children physically and psychologically. According to the World Health Organization, only 50 percent of water in India is safe for drinking and only 30.5 percent of sanitation is safely managed in rural areas.²⁶⁰ In India, there are more people with mobile phones than have a private bathroom.²⁶¹ Effects of poor sanitation and hygiene impact children the most. Children are more prone to get sick and die from waterborne and sanitation-related illnesses, which include diarrhea and malaria. Those children that survive have a tough time learning because of their history of poor health in their childhood years.²⁶² Child mortality in India is still twice the average of other BRIC countries.²⁶³ These issues also disproportionately affect girls—one in four girls misses school one or more days during menstruation and they are often kept home due to the lack of quality bathroom facilities at school.²⁶⁴

Inadequate infrastructure is one of the most problematic factors limiting business in Brazil, according to the 2017 World Economic Forum Global Competitiveness

Report.²⁶⁵ Between 2003 and 2013, Brazil spent significantly less on infrastructure than its BRICS counterparts. Brazil lacks quality transportation systems such as good roads, railways, and other public transportation means for the workforce to move more efficiently. Public investment in services like public transportation can ensure that low-income populations have access to all of the opportunities of cities.

Many Nigerians do not have access to electricity and most suffer from frequent blackouts. One of the biggest complaints of the Nigerian people is the lack of power capacity. There is no reliable electricity supply and businesses are forced to source their own power. Only about 40 percent of the population in Nigeria has access to a power grid.²⁶⁶ In addition, the country has very little public transportation, including railroads, airports, and roads.²⁶⁷ Infrastructure investments focusing on providing access to electricity and better transport networks (roads and railways) would boost the productivity of the economy and provide construction-related jobs. Moreover, basic infrastructure would reduce the costs of doing business, encouraging more businesses to invest in Nigeria and thus creating more private sector jobs.

Kazakhstan needs investments in infrastructure throughout the country, especially roads, highways, and railroads. Transportation between the two major cities, Almaty and Astana, and across the southern region where most agricultural production takes place, is crucial. Weak transportation systems in the country are a barrier for exporting as well as getting fresh produce to cities.

RECOMMENDATION 9

MODERNIZE SOCIAL PROTECTION SYSTEMS TO MATCH TWENTY-FIRST CENTURY NEEDS

The future of the world of work will depend heavily on the ability of governments to build and sustain inclusive social protection systems that address the challenges of technological disruptions, demographic changes, migration patterns, and economic fluctuations. Social safety nets and social protection measures have to adapt to new forms of employment and changing patterns in the world of work to reduce income insecurity and vulnerability. As part of the 2030



▲ Workers weld car parts in the production line of the March and Versa models at Nissan's Industrial Complex in Resende, 160 km west of Rio de Janeiro, Brazil, on Februrary 3, 2015. The Nissan plant in Brazil will be able to produce 200,000 cars and utility vehicles per year.

Source: YASUYOSHI CHIBA/AFP/Getty Images

SDG agenda, many countries are securing efforts to strengthen national social protection systems but face many obstacles to providing adequate coverage for the population—primarily older populations, unemployed persons, women in maternity, children, persons with disabilities, and other vulnerable populations.

One of the largest challenges facing social security systems globally is large aging populations who will depend on pensions and the ability of the state to provide basic protections beyond retirement. In Brazil and Kazakhstan, the aging population poses a moral and social challenge since the elderly will live longer, though they might not have access to formal pensions, retirement funds, quality care or healthcare.

Without social security reforms and introducing care services for the elderly there will be missed opportunities in terms of fiscal sustainability and job creation. Increasing the age limit on retirement, the number of years that employees contribute, as well as piloting portable benefits are some of the elements that can encompass a reform package, although it might not be a popular decision. Offering portable benefits (health, unemployment insurance and retirement) for contractual workers could be pursued, but a market for such providers has to be established. This needs further analysis since its applicability and enforcement might be difficult in developing countries.

RECOMMENDATION 10

DEVELOP A START-UP ECOSYSTEM TO FOSTER ENTREPRENEURSHIP, INNOVATION, AND JOB GROWTH

One way to create formal jobs is through creating start-ups and bringing them to scale. There is a vast literature that highlights the job creation potential of start-ups, ²⁶⁸ and many government programs aim at fostering the growth of SMEs. Modi's "Startup India" and "Atal Innovation Mission" programs are trying to give a boost to and support

tools for start-ups. According to McKinsey, India is the third-largest technology-driven start-up nation after the United States and the UK. The main issue is sustaining and scaling up these start-ups, since as many as 90 percent of them fail within the first five years.²⁶⁹

Similarly, tech start-ups and investment have been on the rise in Brazil. Many companies have headquartered their South American operations in São Paulo, including Uber and Airbnb. Brazil had more than 2,000 start-ups as of 2016, with more than 60 percent of them concentrated in São Paulo.²⁷⁰ Brazil has had a 30 percent annual rate of increase in the volume of funds for start-ups.²⁷¹ However, Brazil has low start-up and entrepreneurship rates compared to other countries. Some of the reasons for the low start-up rates and the failure to scale up include bureaucratic barriers to starting a business, cumbersome construction permits, high taxation, and restrictive labor laws. The top three most limiting factors for business according to the WEF's competitiveness ranking are high tax rates, restrictive labor regulations, and corruption.²⁷² One program leading the way on supporting startups in Brazil is the "Startup Brazil" initiative led by the Ministry of Science, Technology, Innovation and Communication.²⁷³

On the side of government, some ways to establish a start-up ecosystem would be to link up skilling initiatives with the private sector and the education system, increasing funding for start-ups, providing tax incentives, and simplifying regulations to start a business. On the side of the educational and academic community, promoting entrepreneurship curricula, fostering practical experience with established entrepreneurs (going beyond theoretical training), and improving education standards are some of the key recommendations.²⁷⁴

Incentivizing firm growth and creating an entrepreneurial ecosystem is a joint effort that different stakeholders must participate in, including the private sector. The private sector can help start-up firms by investing in the start-up ecosystem and offering technical assistance. Venture capitalists, aside from financing these initiatives, can mentor the start-ups across their lifecycles and encourage collaboration among them. More established firms have a larger role to play in terms of sharing experiences, offering mentorship, and helping in the development of new products, ideas, access to markets, capital, and skills.



he world of work in developing countries is complex and its future remains uncertain. Although developing countries face a serious jobs deficit challenge and are confronting upcoming technological disruptions, not all is doom and gloom on the horizon. The scope and rate of change in labor markets will depend on a variety of country-specific conditions. The institutional response to these impending changes will be key to preparing for transition amid disruptions.

Part of that preparation will require a focus on establishing strategies and a constant dialogue with different stakeholders to identify the main challenges and craft a way forward. It will require thinking simultaneously about the role of education and skills and job growth in rising sectors. It will require prioritizing and learning from other country experiences. There are a series of actions that countries will need to take to prepare for changes that will affect the labor market; this process will require collaboration with and support from the international community, the private sector, NGOs, and country governments. Economies will need to create more and better work opportunities, even with the disruptions taking place. We cannot simply give up on work—we need to shape its future and defend it.

The future of work needs to be shaped, which requires deliberate choices and policies. Those countries that proactively shape this process will create good jobs.

—Irmgard Nübler, Confronting Dystopia

ANNEX A METHODOLOGY FOR COUNTRY CASE STUDIES

CSIS prepared four country case studies in Brazil, India, Kazakhstan, and Nigeria, conducting a deep dive analysis of their labor markets. The case studies analyze the current world of work in each country and the trends looming on the horizon. The case studies are divided into three parts: Part one is a general description of the challenges and main drivers disrupting the labor market. Part two presents the sectors we believe will likely offer better employment and income opportunities in the next five years. Part three presents a set of policy recommendations for a variety of stakeholders that will help make the labor market more adaptable to the oncoming changes.

Between January and May 2018, a CSIS team traveled to these four countries and carried out a series of confidential and off-the-record interviews with a variety of stakeholders to get their perspectives on the future make-up of the world of work. CSIS met with professionals in government, the academic community, companies in rising sectors (technology, tourism), traditional sectors (energy, finance, automotive), trade associations, labor unions, and NGOs. Overall, the CSIS team met more than 100 institutions and 250 thought leaders in these four countries. CSIS also consulted a wide range of secondary sources and databases to conduct the case studies.

CSIS did not carry out a detailed survey, but posed a series of open-ended questions. The aim of the interviews was to get first hand perspectives from company executives, economists and thought leaders, to corroborate some of the findings from prior studies on the topic and at the same time, offer some new insights.

Interview questions included:

- 1. What does the future of "work" in your country look like (5-10 years from now)?
- 2. What are the key drivers of change in your country (good and bad)? What are the big unknowns?
- 3. What do you see as the growing, stagnant, and declining sectors in your country? What type of jobs will be created? Which ones will disappear? Which will readapt?
- 4. How will vulnerable groups be impacted: the poor without education, workers in stagnant industries, those in the informal sector, or the disabled?
- 5. What skills and training (higher education vs. vocational training) will be needed to meet the work needs of the future labor market in your country?
- 6. What is needed beyond skills training?
- 7. How will artificial intelligence, technology, and the increasing presence of start-up companies change the way that people will work in your country? How will these things impact job opportunities and skills needed?
- 8. How is your organization adapting or preparing (policies, programs, training, etc.) to meet the future of work?
- 9. What are your overreaching recommendations to different stakeholders? How can they manage change? What's working now? What's not? What needs to change?
- 10. What keeps you up at night about your country? What gives you hope?

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