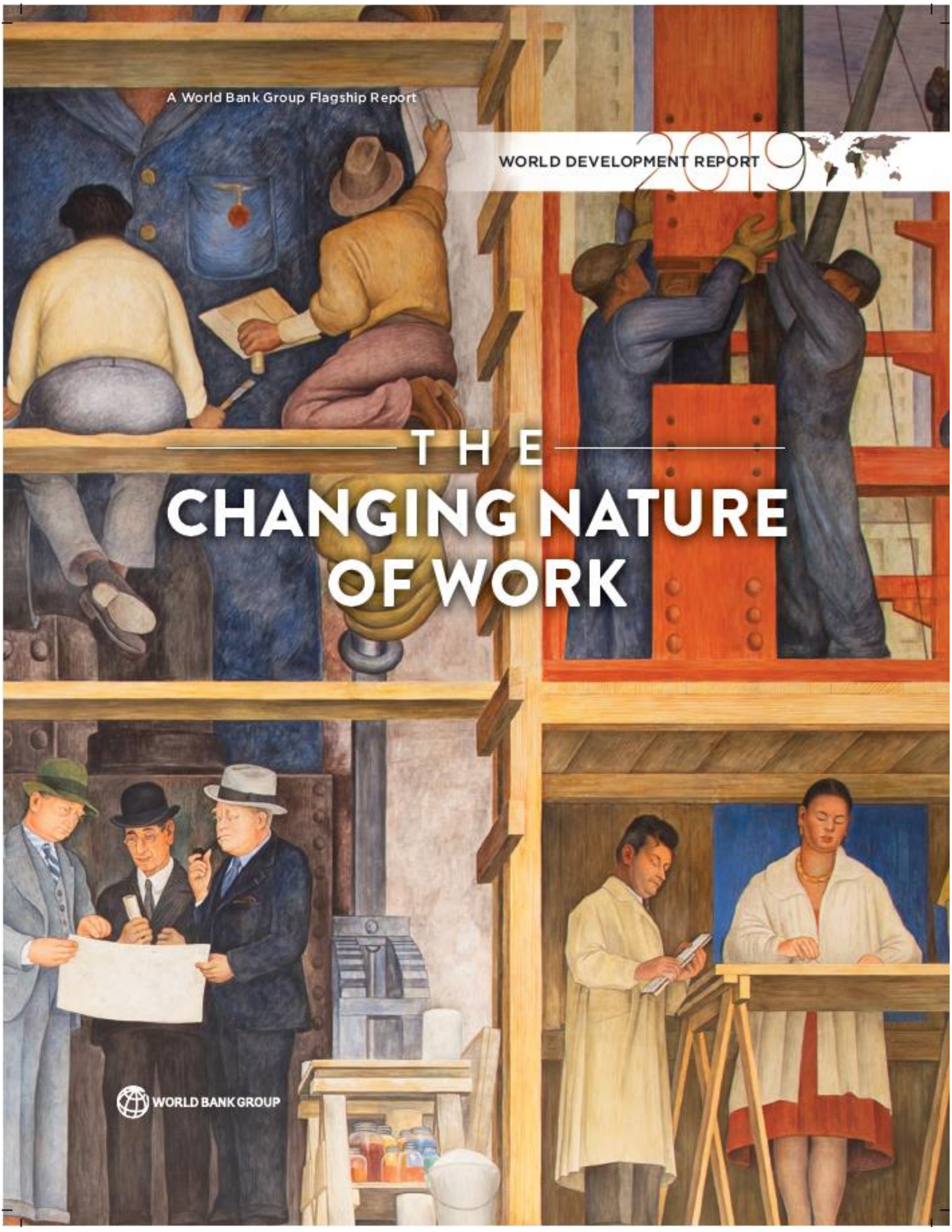

A World Bank Group Flagship Report

WORLD DEVELOPMENT REPORT 2019

THE CHANGING NATURE OF WORK

WORLD BANK GROUP

World Development Report 2019

THE CHANGING NATURE OF WORK

Working Draft

June 22, 2018

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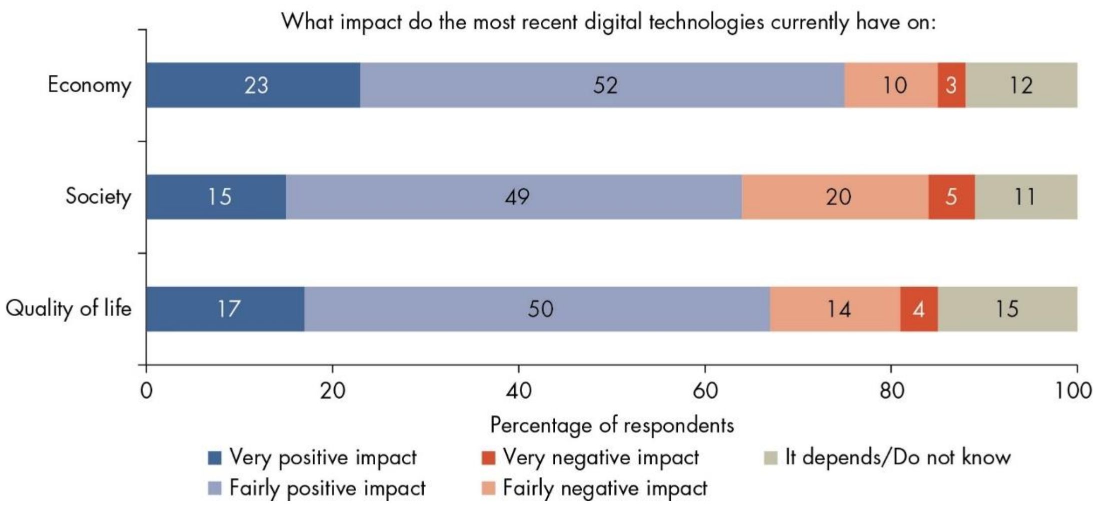
Overview

1. Concerns over technology-led disruption are far from new. Karl Marx worried that "machinery does not just act as a superior competitor to the worker, always on the point of making him superfluous. It is the most powerful weapon for suppressing strikes."[1] Economist John Maynard Keynes warned in 1931 of widespread unemployment due to technology.[2] Yet technological innovations have improved living standards globally. Life expectancy has increased, basic healthcare and education are widespread, average incomes have gone up for most people. The world is better connected, aspirations have risen and citizens' voices are more likely to be heard. In a March 2017 survey conducted in the European Union, 74 percent of the respondents envisioned technology beneficial to jobs, 64 percent thought technology would improve society while 67 percent thought the quality of life would rise (figure 0.1).

Figure 0.1. Technology improves the European economy, society, and quality of life



Source: Authors' calculations based on Special Eurobarometer 460 "Attitudes towards the impact of digitization and automation on daily life," Question 1, European Commission 2017.

2. Manufacturing jobs are lost due to automation in a number of advanced economies and some middle-income countries. Workers involved in routine tasks that are "codifiable" are most vulnerable to replacement. The adjustment to this loss is especially challenging because many of the new jobs require significantly higher levels of human capital. In the absence of countervailing policies, some workers in advanced economies are pushed into lower-wage jobs or temporary spells of unemployment. As automation erodes the benefits of low wages, formal industrial jobs do not get created in Africa or South Asia.

3. In the changing nature of work, the forces of labor supply and demand collide. In some developing countries, particularly in Africa, the Middle East and South Asia, tens of millions of young people join the labor market looking for jobs. But those workers face uncertain demand. Large formal private firms are still too few. Their growth is often stunted due to trade barriers, domestic bias towards state-owned or politically connected firms, the slow pace of technology adoption, or stifling regulation.[3] These markets remain also largely informal.

4. The biggest fear is that automation is going to undo the employment benefits of open trade and investment in some developing economies; while not allowing these benefits to accrue in other developing countries. Africa and South Asia may never become the industrial powerhouses that China or Vietnam has become. A further question is whether developing economies can develop an export-oriented service sector. Progress depends on accumulating human capital, building infrastructure for business needs, as well as perfecting the rules and taxes that impact the creation of formal employment.

What is Changing in the World of Work

5. Several stylized facts have dominated the discussion on the changing nature of work. This study finds that only some of them are accurate in the context of developing economies.

6. First, technology is reshaping the skills needed for work. Demand for less advanced skills that can be substituted by technology decreases while demand for advanced skills that complement technology increases. Demand for advanced cognitive skills, socio-emotional skills, and skill-combinations associated with greater adaptability is also increasing. This pattern is evident in developed countries. It is starting to be seen in some developing countries as well. In Bolivia, the share of employment in high-skilled occupations increased by eight percentage points between 2000 and 2014. In Ethiopia, this increase was 13 percentage points. These changes show up not just through new jobs replacing old jobs, but also through the changing skills profile of existing jobs (figure 0.2).

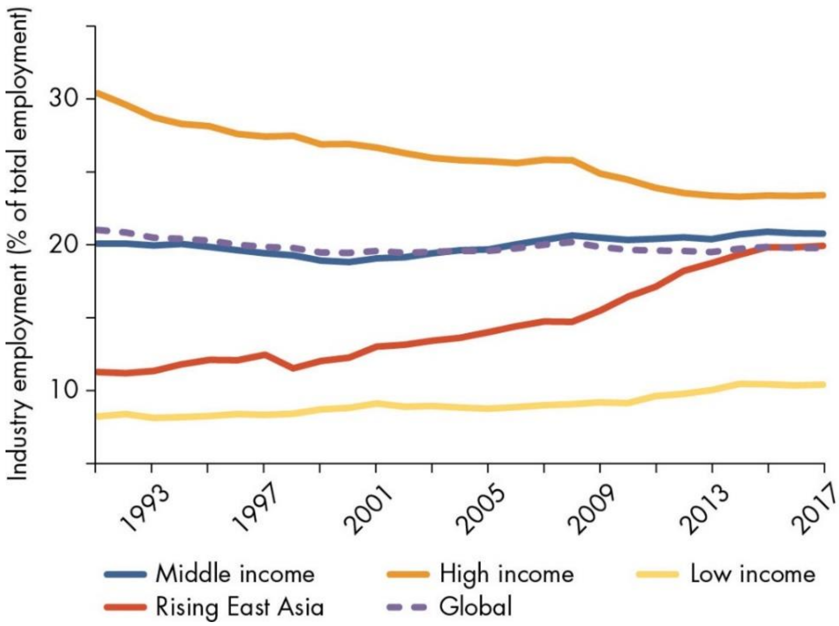
Figure 0.2. Nonroutine analytical and socio-emotional skills are becoming more important

Source: Authors' analyses based on Wenhui News and career website.

7. Second, scenarios of robots replacing workers strike a societal nerve. The threat to jobs from technology is exaggerated—history repeatedly teaches us this lesson. Global industrial jobs

data do not bear out these concerns (figure 0.3). While advanced economies have shed manufacturing jobs, the rise of the industrial sector in East Asia has more than compensated for this loss.

Figure 0.3. Industrial jobs are falling in the West, rising in the East



Source: Authors' calculations based on World Development Indicators.
Note: "Rising East Asia" include Cambodia, Indonesia, Lao PDR, Mongolia, Myanmar, Thailand, the Philippines and Vietnam.

8. The decline in industrial employment in many high-income economies over the past two decades is a well-studied trend. Singapore, Spain, and Portugal are among the countries where the share dropped 10 percent or more since 1991. This change mainly reflects a shift in employment from manufacturing to services. In contrast, the share of industry employment, primarily manufacturing, has remained remarkably stable in the rest of the world. In low income countries, from 1991 to 2017, the proportion of the total labor force working in industry has been consistently around 10 percent. The situation was relatively constant in upper-middle income countries too, at around 23 percent. Lower middle-income countries experienced an increase in the proportion of the labor force in industry over the same period, from 16.4 percent in 1991 to 18.8 percent in 2017. This may be due to the interplay between open trade and rising incomes—which generates more demand for goods, services, as well as technology.

9. In some developing economies the share of industry overall is going up. For example, between 1991 and 2017 the share of industrial employment in Vietnam has risen from nine to 25 percent. In Lao PDR, the share of industrial employment rose from 3.2 percent to 9.7 percent over the same period. These countries have rapidly upgraded their human capital, bringing highly skilled young workers to the labor market who combine with new technology to upgrade manufacturing production. As a result, industrial employment in these countries continues to rise while in other developing economies it is stable.

10. Two forces interact to create demand for industrial products. On the one hand the decreasing costs of connectivity create more capital-intensive exports from advanced economies

and more labor-intensive exports from developing economies. On the other hand, rising incomes bring higher consumption of existing products. The number of new products also expands. These two forces increase the overall demand for labor. A further effect is the increase in financial returns for those who create new products.

11. Third, technology is changing the nature of production. Online platform firms concentrate market power in both product and labor markets. Technology blurs the boundaries of the firm, as seen in the rise of platform marketplaces. Platforms and network effects concentrate activities in a few large firms since they can expand at virtually no marginal cost. Platform-based businesses are on the rise in every country—such as Flipkart in India or Jumia in Nigeria. The rise of these platform firms reduces or eliminates search and transaction costs but raises policy questions in the fields of privacy, competition and taxation.

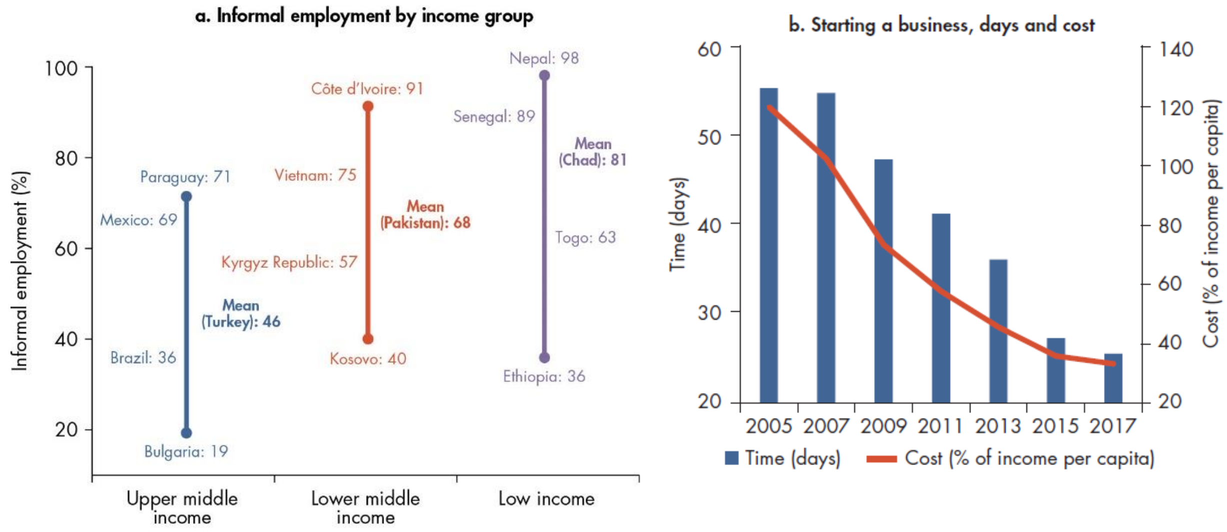
12. Fourth, there are concerns about the rise of the gig economy, where organizations contract with independent workers for short-term engagements. The gig economy provides opportunities for distant or flexible work but strips workers of some social protections.

13. It is difficult to estimate accurately how many people work in the gig economy. But where data exist, the numbers are small. Data from Germany indicate that only 0.8 percent of the labor force is active in the gig economy. Worldwide, the total freelancer population is estimated at around 84 million—less than three percent of the global labor force (3.5 billion).[4] Someone who is counted as a freelancer may also engage in traditional employment. In the United States, for example, more than two thirds of 57.3 million freelancers are in traditional employment, using freelancing to supplement income.[5] Freelancer of Australia, one of the largest global online freelancing platforms, has around 15 million registered users. But only about ten percent of registered workers are active. The best estimate is that less than one percent of the active labor force is in the gig economy globally.

14. Instead, the rise in gig work, albeit a small proportion of the overall workforce, highlights age-old problems. People have no better alternatives. Wages from traditional employment are not enough. Jobs in the gig economy are taken up voluntarily because they are better than the other options available—oftentimes, that means jobs in the informal sector.

15. Fifth, in many developing countries, large shares of workers remain in low-productivity employment, often in informal sector firms with little access to technology. Informality has remained high across regions over the past two decades despite improvements in the business regulatory environment (figure 0.4). The share of informal workers is as high as 90 percent in some developing economies. For countries such as Zambia or Madagascar informality is around 80 percent. Around 55 percent of the labor force in emerging economies is informal. Informality has remained remarkably stable notwithstanding the changing nature of work: in Peru, for all the attention focused on the issue, informality has remained relatively constant around 75 percent in the last 30 years. In Sub-Saharan Africa informality has on average remained around 75 percent of total employment from 2000-2016. In South Asia, it has increased from an average of 50 percent in the 2000s to 60 percent in the period 2010-2016. Addressing informality and the absence of social protections for many workers across the globe continues to be the most pressing concern for emerging economies.

Figure 0.4. Informality persists in most emerging economies despite improvements in the regulatory environment



Source: Authors' calculations using household and labor force survey data from the International Income Distribution Database (left panel). Djankov et al. 2002; World Bank Doing Business Indicators (right panel).
Note: The figure in the left panel presents the latest available estimates of shares of informal employment for emerging economies. In the sample, a person is identified as informal worker if he or she does not have a contract, social security, and health insurance; is not part of a labor union. Emerging economies include all countries within middle and low-income classification. The sample consists of 68 emerging economies. The figure in the right panel is the estimated time and cost of starting a business for 103 emerging economies.

16. Sixth, technology, in particular social media, affects the *perception* of rising inequality in many countries. This perception is not corroborated by the data on income inequality. The latest estimates suggest that inequality has been rising in a fair number of advanced economies. Inequality rose in 11 out of 30 advanced economies analyzed. Inequality in most emerging economies has decreased or remained unchanged in the past decade. From 2008 to 2015, 37 of 41 emerging economies experienced a decline or no change in inequality (as measured by the Gini coefficient). The four emerging economies where inequality rose are Armenia, Bulgaria, Cameroon, and Turkey.

17. In Brazil, the Gini measure of inequality declined from 60.12 in 1993 to 51 in 2014. Over the same period, there was a decline in the top ten percent share of the pre-tax income (from 56 percent to 55 percent). A higher stock of human capital, driven by the expansion of secondary and tertiary education, explains part of this downward trend. More formal jobs also contributed to decreasing inequality. Meanwhile the expansion of social safety nets supported the poor.

18. The Russian Federation shows a similar trend. Between 2007 and 2015, the Gini measure of inequality fell from 42 to 38. Over the same period there was a decline in the top ten percent of pre-tax income, which dropped from 52 percent to 47 percent. The share of employment in small firms increased over that period, which improved wages relative to large firms. Improvement in overall education levels of workers—mainly among female workers—combined with a reduction in the overall skill premium, also reduced inequality.

What Can Governments Do?

19. The analysis suggests three takeaways for governments, including as part of a broader social contract. Actions include:

- Individuals, firms and governments need larger investments in human capital. This investment is under-provided in many developing countries, especially in the early formative years of a child. Investing in human capital is the main mechanism to ensure that the next generation of workers is ready for the changing nature of work.

- Governments need to enhance social protection. A societal guaranteed minimum and strengthened social insurance, complemented by reforms in labor market rules, work towards achieving this goal.

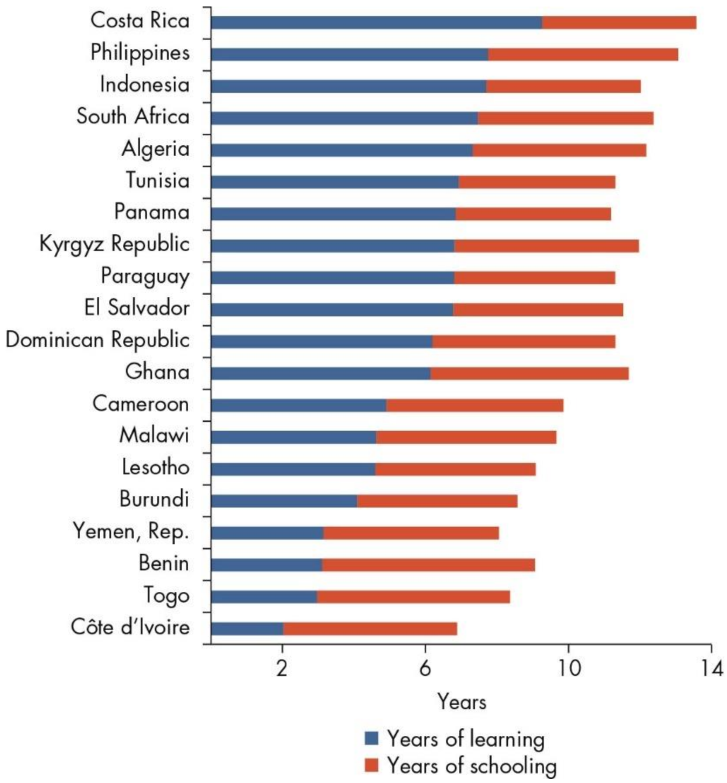
- Taxation is in dire need of upgrading. Many global corporations, especially among the new platform companies, use tax avoidance techniques to increase their profits. Property taxes in large cities, exercise taxes on sugar and tobacco, automatic links between customs and VAT databases to identify tax evasion, levying carbon taxes are among the ways to increase government revenue.

20. First, the most significant investments that people, firms and governments can make is in enhancing human capital. A basic level of human capital, such as literacy and numeracy, is needed for economic survival. The increased role of technology means that all types of jobs (including low-skilled jobs), demand more advanced cognitive skills. The role of human capital is also enhanced because of increasing demand for socio-emotional skills. Jobs that rely on inter-personal interaction are not readily replaced by machines. However, to succeed at these jobs, socio-emotional skills—established in early years and shaped throughout our lifetimes—need to be strong. Finally, human capital is important because of the increased premium on adaptability. Adaptability is the ability to learn new skills quickly. This ability is shaped through human capital investments, especially in early years.

21. Many countries under-invest in human capital. This under-investment will become more expensive for economies as the nature of work changes. Sub-optimal human capital puts new generations at a severe disadvantage, especially among the poorest. This individual disadvantage aggregates to low economic competitiveness on the global arena. Low investments in human capital are also likely to exacerbate existing inequalities. This puts security at risk, as unmet aspirations can lead to unrest.

22. Effective solutions are available. For instance, to get ready for the changing nature of work countries must boost their investment in early childhood development. This is one of the most effective ways to build valuable skills for future labor markets. Further, countries can significantly boost human capital by ensuring that schooling actually translates into learning. In many education systems, a year of schooling produces only a fraction of the learning it can (figure 0.5). Important skills re-adjustments for the changing nature of work are also likely to take place outside compulsory schooling and formal jobs. Countries can gain a serious advantage by making use of these opportunities. For instance, by deploying tertiary education and adult learning more effectively.

Figure 0.5. Learning varies across emerging economies, 2018



Source: Authors' calculations based on Kim 2018 and Filmer et al. 2018.
Note: The estimates are provisional, and are subject to further changes.

23. One reason why countries do not invest enough in human capital is because they lack the political incentives to do so. There is little publicly available data on whether health and education systems are generating human capital. This gap hinders the design of effective solutions, the pursuit of improvement, and the ability of citizens to hold their governments accountable. The World Bank's Human Capital Project is designed to address the issue of missing political incentives. By doing so it aims to provide the impetus for investing in human capital.

24. Second, people in developing countries should be protected through social assistance and insurance systems that fit with the changing nature of work. The concept of "progressive universalism" could be a guiding principle in covering workers in the informal economy. Once such protections are in place, labor regulation can be made more flexible to facilitate work transitions.

25. The current social contract is broken in most developing economies. It looks increasingly out of date for some advanced economies too. A new social contract is needed. Investing in human capital increases the opportunities for workers to find better jobs. Such investment improves the job prospects for newborns or kids in school.

26. Social contracts are about inclusion. For such inclusion to succeed, the rich have to pay their share of taxes. As simple as this proposition sounds, it is still not followed in many countries. Governments can do better.

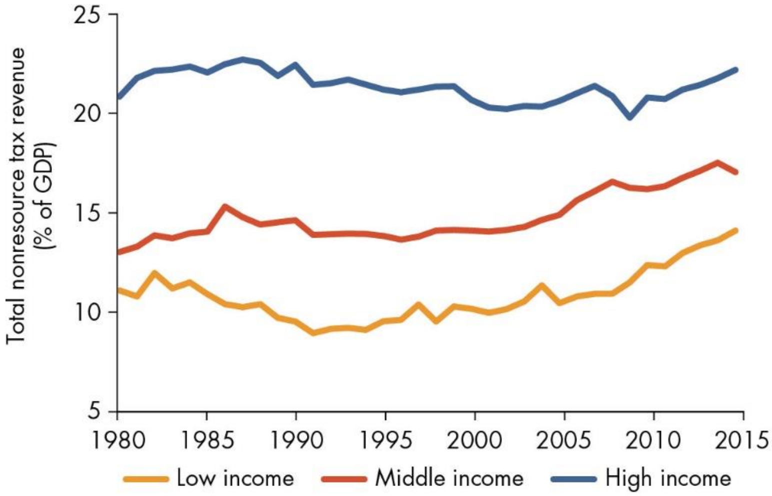
27. Third, rising global incomes have expanded markets, as have digital platforms. But age-old tax avoidance schemes have flourished too. On average, almost 60 percent of the total income of multinationals is reported in jurisdictions with an effective tax rate of less than five percent. The structure of the global tax system permits multinational corporations to engage in base erosion and profit shifting: firms allocate more profits to affiliates located in zero or low tax to countries, irrespective of how little business is conducted there. Four out of five Fortune 500 companies operate one or more subsidiaries in tax haven countries. Governments worldwide miss out US$100–$240 billion in lost annual revenues.

28. The increasingly digital nature of business makes tax avoidance worse. Corporate income tax rules, including in bilateral income tax treaties, are founded on the principle of physical presence. This means that digital platform companies located in one (low tax) country which supply services online to a consumer in another (higher tax) country have an unfair advantage over local companies or other foreign companies located in higher tax jurisdictions. Digital companies also generate revenue from new kinds of assets, such as user data or online advertisements, but it is not clear how or where value is created for tax purposes (even in those countries that have a right to tax in the first place). As a result, digital companies carry a smaller tax burden than traditional brick and mortar companies.

29. Governments have to put a stop to tax avoidance. The only way to do so, is to put an end to the divorce between the location of profits and the location of real activities. If firms are digital, the location is most justifiably where goods or services are consumed. Profit-shifting practices that involve syphoning revenues off to affiliates in low tax jurisdictions—ostensibly as payment for using a brand's intellectual property, for example, should be curbed. Tax breaks for profits generated through intellectual property should also be revisited. Amending international tax rules, shutting down tax havens, as well as developing new ways to tax the digital economy, should all be on the table.

30. The share of tax revenue in developing economies is half of the share in advanced economies (figure 0.6). With such revenues, governments are unable to deliver social inclusion. The solutions are known: impose or increase tobacco and carbon taxes, make platform and other global companies pay their equal share of corporate taxes in every country, eliminate VAT exemptions in some countries, eliminate energy subsidies in other countries.

Figure 0.6. Tax revenues have to rise in developing economies



Source: Authors' calculations based on International Centre for Tax and Development (ICTD) and UNU-WIDER Government Revenue Dataset 2017.

Box 0.1. The Study's Narrative

Fear of the future has always been with us. Today, these concerns are more acute. In advanced economies, there is anxiety about the sweeping impact of technology on employment. Widely-shared views posit that rising inequality of opportunity, compounded by the advent of the gig economy, prompts a race to the bottom in working conditions.

On balance, this study shows that this troubling scenario is relevant for one in four advanced economies. Such fears are as yet unfounded in developing economies. Instead, technology provides opportunities to create new jobs in old and new sectors, increase productivity in the informal economy, and deliver effective public services.

There are two ways in which technology is changing the nature of work. First, technology is shifting the mix of skills required to succeed in the labor market. The demand for advanced skills increases as routine jobs become automated. At the same time, the demand for less advanced skills that can be substituted by technology decreases. This pattern is prominent in developed countries and is starting to occur in developing countries. Second, technology is changing production patterns. The rise of platform marketplaces and their network effects blurs boundaries of the firm, concentrating activities in a few large firms which expand at virtually no marginal cost. This new industrial organization poses policy questions in the fields of privacy, competition and taxation. Governments' ability to raise revenues is curtailed by the virtual nature of productive assets.

The pace of change in labor demand may accelerate. But changes in labor supply have not kept up because education—just like regulations—is slow to adapt. In many developing countries large shares of workers remain in low-productivity employment, often in the informal sector with little access to technology or protection.

Technological change leaves some workers behind. To seize the benefits of technological change, more and better investments in human capital, basic infrastructure, and social protection are needed.

Investing in human capital is the priority. Three types of skills are increasingly important in labor markets: advanced cognitive skills (such as complex problem-solving), socio-emotional skills (like team work), and skill-combinations that are predictive of adaptability (e.g., reasoning, self-efficacy). Building these skills requires strong human capital foundations and lifelong learning.

Human capital foundations, created in early childhood, are more important than ever. Yet, governments in developing countries do not prioritize early childhood development. The Human Capital Index (HCI) highlights the link between health and education investments with the productivity of future workers. Climbing from the 25th to the 75th percentile on the HCI brings about an additional 1.4 percentage annual growth rate for 50 years.

Investments in infrastructure are also needed. Most obvious is the need to provide universal, affordable access to the internet to the population in developing countries that remains unconnected. Equally important is to increase investments in complementary infrastructure needed for firms, governments and individuals to be able to use digital technologies to their potential.

Investments in human and physical capital need to be complemented by social protection systems. Eight out of ten people in developing countries have no social assistance, while six out of ten work informally and consequently do not benefit from insurance.

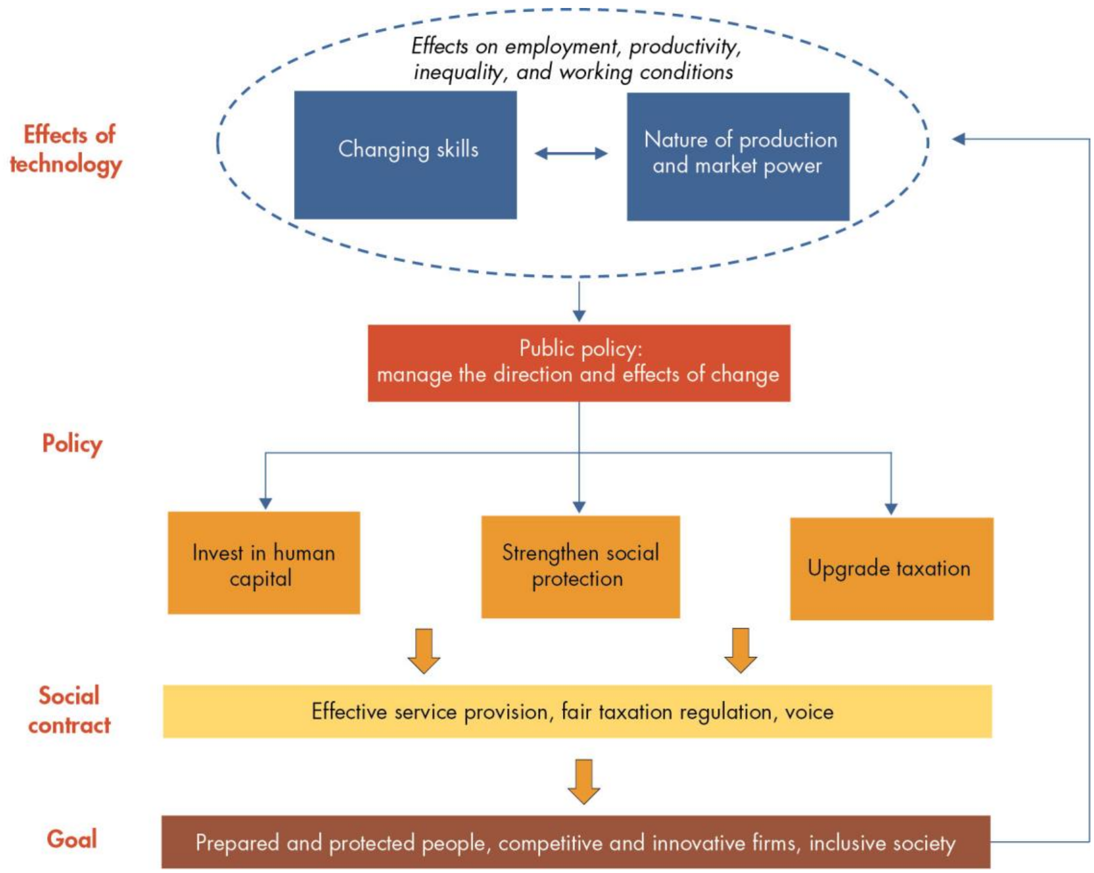
Even in advanced economies, payroll-based insurance model is increasingly challenged by working arrangements outside standard employment contracts. New ways of protecting people are needed. A societal minimum that provides support independent of employment is one such option. This model, which would include mandated and voluntary social insurance, could reach substantially larger swaths of the population.

Strengthening social protection can be achieved through ‘progressive universalism’, emphasizing adequate support to those most in need. This study investigates universal basic income as a policy, but recognizes that it is untested and fiscally prohibitive for developing economies.

To benefit from the potential that technology offers, societies need a new social contract centered around larger human capital investments and progressively universal social protection. For this contract to work, social inclusion needs fiscal space. Many developing countries lack finances because of inadequate tax bases, large informal sectors, and inefficient administration.

There is plenty of room for improvement, for example through better collection of property taxes in urban municipalities or through the introduction of excise taxes on sugar or tobacco. The latter has direct health benefits too. Relevant gains can also come from reducing tax avoidance by global corporations, especially among the new platform companies. The structure of the antiquated global tax order permits multinational corporations to engage in base erosion and profit shifting: firms allocate more profits to affiliates located in zero or low tax countries, irrespective of how little business is conducted there. On average, 60 percent of the total income of multinationals is reported in jurisdictions with an effective tax rate of less than five percent.

Economies are in the midst of a technological shift that brings change to the nature of work. The outcome cannot be predicted with any certainty, hence societies would do well to heed the emerging challenges. This study identifies some of the policy options for leveraging technology for the benefit of citizens.



This Study's Running Order

31. The first chapter of this study focuses on the impact of technology on jobs. In some sectors robots replace workers. Yet technology absorption in many parts of the world is slow, limiting automation's effects. In other sectors, robots enhance worker productivity. In other cases, technology changes the demand for skills.

32. Ongoing technological disruptions have increased the premia on human capital. At the economy-wide level, human capital is positively correlated with overall level of adoption of

advanced technologies. Firms with a higher share of educated workers do better at innovating. Individuals with stronger human capital reap higher economic returns from new technologies. On the other hand, when technological disruptions are met with inadequately realized human capital, existing social order may be undermined. The second chapter addresses the link between human capital accumulation and the future of work, discussing why governments need to invest, why they often fail to, and how better measurement addresses this problem.

33. Part of the ongoing skills re-adjustment is happening outside compulsory education and formal jobs. Where? Chapter 3 answers this question by exploring three domains—early childhood, tertiary education, and adult learning outside jobs—where people acquire specific skills that are demanded by the changing nature of work.

34. Work is the next venue for human capital accumulation after school. Chapter 4 evaluates how successful economies are in generating human capital at work. Advanced economies have higher returns to work than emerging economies. Governments can raise the returns to work by increasing formal jobs for the poor, enabling women's economic participation, as well as expanding agricultural productivity in rural areas. There is little scope for emerging countries to improve the returns to work by reallocating labor from villages to cities.

35. What are the implications for social assistance, social insurance and labor market institutions? This question is explored in chapter 5 of the study. As the nature of work becomes more fluid, traditional provisions of social protection through formal employers become increasingly obsolete. In developing countries, where informality is the norm, this model has been largely aspirational. The combination of old and new labor market challenges calls for strengthening social protection and labor market institutions. These can build on a range of significant innovations in social protection programs, including in lower income settings.

36. Chapter 6 examines how technological change affects the nature of the firm. Technological progress has made firm boundaries more permeable. New digital technologies accelerate the trend toward superstar firms. Superstar firms have a beneficial effect on labor demand by boosting production, and therefore employment. These firms are also large integrators of young, innovative firms, often benefiting small businesses by connecting them with larger markets. But large firms, particularly firms in the digital economy, also pose policy challenges. Regulations often fail to address the challenges created by new types of business in the digital economy. Tax systems are also in many ways no longer fit for purpose.

37. Changes in the nature of work, compounded by rising aspirations, make it essential to increase social inclusion. New elements of the social contract need to respond to rising concerns around inequality and unfairness. Chapter 7 considers potential elements of the contract, how technology can be used in implementation, and how to finance them in the context of the changing nature of work.

Chapter 1: The Changing Nature of Work

38. From the beginning, robots were construed as worker-replacing machines. Karel Čapek, the Czech writer who invented the word robot in 1920, used the Slavic language for work "robota" to connote what these machines are used for. In the past century, machines have replaced workers in many tasks. Technology has brought higher labor productivity to many sectors by reducing the need for workers in routine tasks. It has opened new sectors, previously only imagined in the field of science fiction. On balance, technology has created more jobs than it has displaced.

39. Technology improves overall living standards. As technology advances, new ways of production are adopted, markets expand, societies evolve. Workers, firms and governments build new comparative advantages as conditions change. For example, Danish firms became the global exporters of hearing aid products in the 2000s by adopting 3D technology first.[6] The Indian government became a world leader in high-tech sectors after it invested in numerous technical universities across the country. Vietnamese workers learned foreign languages when the country began integrating into global value chains.

40. Technology enhances the productivity of workers. Consumers enjoy more product choice at lower prices. Firms use new technologies to improve capital utilization, overcome information barriers, outsource, and innovate. Online trade platforms expand market opportunities for firms, with some platform companies becoming markets themselves. Even small firms can be global. The firms selling on eBay in Chile, Jordan, Peru and South Africa are younger than firms in the offline markets.[7] Start-ups in China are well-represented on the Alibaba platform.[8] New technologies enable firms to more efficiently manage their operations, hiring workers in one location to produce parts, in another location to assemble, and in a third location to sell. Societies benefit more broadly as technology expands options for service delivery and for citizens to exercise their voice to hold governments accountable.

41. Notwithstanding these opportunities, there is disruption, too. The declining cost of machines puts at risk low-skill jobs that are intensive in routine tasks. These are the occupations that are most susceptible to automation. Displaced workers are likely to compete with (other) low-skilled workers for jobs with low wages. Even when new jobs arise retooling is costly and, in many cases, not possible.

42. The displacement of workers generates anxiety, just as in the past. In 1589, Queen Elizabeth I was alarmed when clergyman William Lee applied for a royal patent for a knitting machine. "Consider thou what the invention would do to my poor subjects," she replied. "It would assuredly bring them to ruin by depriving them of employment."[9] The Qing dynasty fiercely opposed constructing railways in China during the 1880s, arguing that the loss of luggage carrying jobs might lead to social turmoil.[10] Despite the economic growth fueled by steam power and industrial machinery, Luddites sabotaged machines to defend their jobs in Britain during the early 19th century.

43. The rise of the robot is discussed most frequently in the context of the industrial sector. Fears about robot-induced unemployment have dominated the discussion over the future of work. The decline in industrial employment in some high-income economies over the past two decades

is an established trend. Singapore, Spain, United Kingdom and Korea are among the countries where the share dropped more than ten percentage points. But this trend mainly reflects a shift in employment from manufacturing to services. In contrast, millions of manufacturing jobs have been created in developing countries since the late 1980s. The share of manufacturing employment has increased significantly in a few emerging markets such as Vietnam and Cambodia. On average the share has remained stable in developing countries, against the numerous predictions of job losses resulting from technology.

44. Technology is significantly disrupting demand for three types of skills. These are general cognitive skills, job-specific skills, and socio-emotional skills. This is reflected in rising returns to advanced cognitive and socio-emotional skills. Globally, private returns to education, at about nine percent a year, remain high despite the significant expansion in supply. Returns to tertiary education are at almost 15 percent a year. Individuals with more advanced skills can take better advantage of new technologies and adapt to the changing nature of work. In fact the more volatile the state of technology, the more productive education could be. For example, returns to primary schooling in India increased during the Green Revolution, with more educated farmers adopting new technologies.[11]

45. The disruptive effect of technology does not manifest equally across the globe. Persistent informality continues to pose the greatest challenge in emerging economies. Despite technological advances, informal employment remains at more than 70 percent in Sub-Saharan Africa and South Asia, and more than 50 percent in Latin America. In India, the informal sector has remained around 90 percent notwithstanding rapid economic growth. Both wages and productivity are significantly lower. They live without health insurance or social protection.

46. Technology improves overall living standards. However, the process of job creation and destruction works society-wide—and not just for the few—when rules of the game are fair. Workers in some sectors or countries benefit handsomely from technological progress. Workers are dsipalced in other sectors, having to retool to survive. Platform technologies create huge wealth, but place it in the hands of the few.

Technology Generates Jobs

47. "They're always polite, they always upsell, they never take a vacation, they never show up late, there's never a slip-and-fall, or an age, sex or race discrimination case," Andrew Puzder, chief executive of Hardee's restaurant chain with headquarters in Tennessee, says of swapping employees for machines.[12] Hearing this gives workers reasons to worry.

48. People begin to fear the advent of a "jobless economy" when tasks previously performed by humans are taken over by robots, especially those enabled with artificial intelligence. The number of robots operating worldwide is rising rapidly. By 2019, there will be 1.4 million new industrial robots in operation, taking the total to 2.6 million worldwide.[13] Robot density per worker in 2018 is highest in the Republic of Korea, Singapore and Germany.

49. These robots replace workers. Workers involved in routine tasks that are "codifiable" are most vulnerable to replacement. The examples are numerous. More than two thirds of robots are employed in the automotive, electrical/electronics, as well as metal and machinery industry.

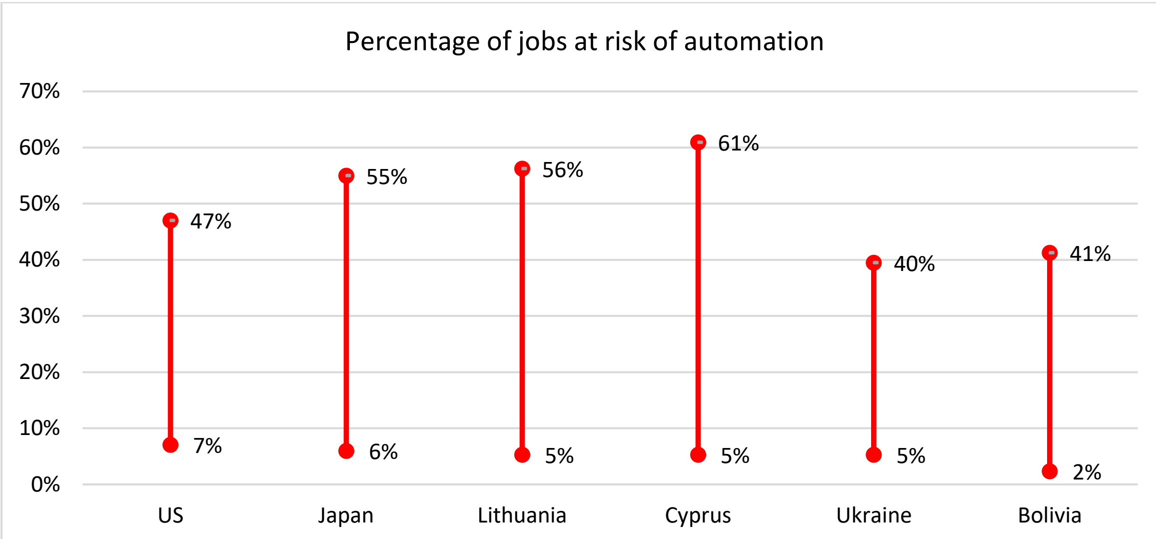
Foxconn Technology Group, the world's largest electronics assembler based in Taiwan, China, cut its workforce by 30 percent when it adopted robots into the production process (from 1.3 million in 2012 to 873,467 by the end of 2016).[14] If robots are cheaper than existing manufacturing processes, firms can reshore or relocate production in order to be closer to consumer markets. In 2017, 3-D printing technologies enabled the German company Adidas to establish two "speed factories" for shoe production in Ansbach, Germany, and Atlanta, United States, eliminating more than 1,000 jobs in Vietnam. In 2012, the Dutch multinational technology company Philips Electronics shifted production from China back to the Netherlands.

50. Some service jobs are also susceptible to automation. Mobileye of Israel is developing driverless vehicle navigation units. Baidu, the Chinese technological giant, is working with King Long Motor Group, China, to introduce autonomous buses in industrial parks. Financial analysts, who spend much of their time conducting formula-based research, are also experiencing job cuts: Sberbank, the largest bank in the Russian Federation, relies on artificial intelligence to make loan decisions in 35 percent of cases, anticipating this to increase to 70 percent in less than five years.[15] "Robot lawyers" have already substituted for 3,000 jobs in Sberbank's legal department. The number of back office employees overall has shrunk to 1,000 by 2021, down from 59,000 in 2011. Ant Financial, a fintech firm in China, uses big data to assess loan agreements instead of hiring thousands of loan officers or lawyers.[16]

51. Although some workers are already being replaced by robots, it is difficult to put a figure on the level of job displacement that will take place overall. Indeed, even the best economists are notoriously bad at predictions. In 1930, John Maynard Keynes declared that technology would usher in an age of leisure and abundance within a hundred years. "Everyone would need to do some work if he is to be contented," he wrote, "but three hours a day is quite enough."[17] The world in 2018 is far from this kind of reality.

52. Some economists predict job losses in the current wave of technological advancement, but with wide differences (figure 1.1). For Bolivia, job automation estimates range from two percent to 41 percent. In other words, anything from 100,000 to two million Bolivian jobs in 2018 are likely to be automated. The range is even wider for advanced economies. In Lithuania, five to 56 percent of jobs are at risk of being automated. In Japan, six to 55 percent of jobs are at risk.

Figure 1.1. Wide variance in the perceived jobs at risk due to automation



Source: Authors' calculations based on World Bank 2016a and Arntz et al. 2017.
Note: The figures represent the highest and lowest estimate of the percent of jobs at risk of automation for economies that have more than one estimate in different studies. A job is at risk if its probability of being automated is greater than 0.7, following Frey and Osborne 2017.

53. The wide range of predictions demonstrates the high uncertainty involved in estimating how technology affects jobs. Most estimates rely on automation probabilities developed by machine learning experts at Oxford University in the United Kingdom. They were asked to categorize a sample of 70 occupations taken from official United States occupational categories as either strictly automatable or not (1-0). Using these probabilities, initial estimates placed 47 percent of U.S. occupations at risk of automation.[18] Basing probabilities on the opinion of experts is instructive but not definitive. Moreover, using one country's occupational categories to estimate possible job losses due to automation elsewhere is problematic.

54. Job loss predictions have also struggled to incorporate technology absorption rates. Technology absorption can be painstakingly slow and differs not only between countries but also across firms within countries—it therefore influences the potential for technology to destroy jobs. For example, useage of the internet and mobile phones by people spread much more quickly compared with earlier technologies but among firms, especially in the informal sector, internet useage is low. The uptake of mechanization in agriculture paints a similar picture: persistent trade barriers, the relatively low cost of labor compared to agricultural machines and poor information all contribute to the low rates of mechanization in low and some middle-income countries. Even with the Spinning Jenny, the relatively low cost of labor in France and India delayed its introduction in those countries: in 1790 there were only 900 Jennies in France compared to 20,000 in England.[19] The prevalence of automation versus labor continues to vary across countries depending on the context.

55. The World Development Report 2016 adjusted the automation probabilities from Oxford University for differing technology absorption rates. It concluded that over 60 percent of jobs are susceptible to automation from a technological standpoint in Argentina and over 50 percent in Angola. Two years later, another World Bank study that implicitly incorporated technology

absorption rates concluded that less than ten percent of Argentina's jobs are at risk.[20] The divergence in these results prompts skepticism around their reliability.

56. New jobs are created through technology, too. Overall, technological change that replaces routine work is estimated to have created more than 23 million jobs across Europe from 1999 to 2016—almost half of the total employment increase in the same period. Recent evidence for European countries suggests that while technology may be substituting workers in some jobs, overall it is raising labor demand.[21] Instead of hiring traditional loan officers JD Finance, a leading fintech platform in China, created more than 3,000 risk management or data analysis related jobs to manage databases and sharpen algorithms for digitized lending.

57. Technological progress directly creates jobs in the technology sector. The internet of things means that people are relying on portable devices to work, organize their finances and have fun. Humans create the online interfaces that drive this growth. With consumer interests changing fast, there are only more opportunities for individuals to pursue careers in mobile app development or virtual reality design.

58. Technology has also facilitated the creation of jobs through online work or in the gig economy. Andela has built its business model on the digitization of Africa. It has trained 20,000 software programmers across Africa using free online learning tools. Once qualified, programmers work with Andela directly or join other Andela clients across the world. It aims to train 100,000 African software developers by 2024. Ninety percent of its workers are in Lagos, Nigeria, with other sites in Nairobi, Kenya, as well as Kampala, Uganda.[22]

59. New technologies increase productivity, allowing workers to focus on more creative tasks. Just as bank tellers in the past shifted their tasks towards more relationship-building at the dawn of ATMs, clerks can be retrained to include tasks that involve data analysis. Heightened productivity leads to spillovers in the tradable and non-tradable sectors as rising incomes increase demand for goods and services, thereby increasing jobs. In Sub-Saharan Africa the food industry is expanding to feed the growing middle class. The extent of these spillovers cannot realistically be accounted for in future job loss predictions. Moreover, these trends are less strong in emerging economies, where incomes are still catching up with consumption needs.

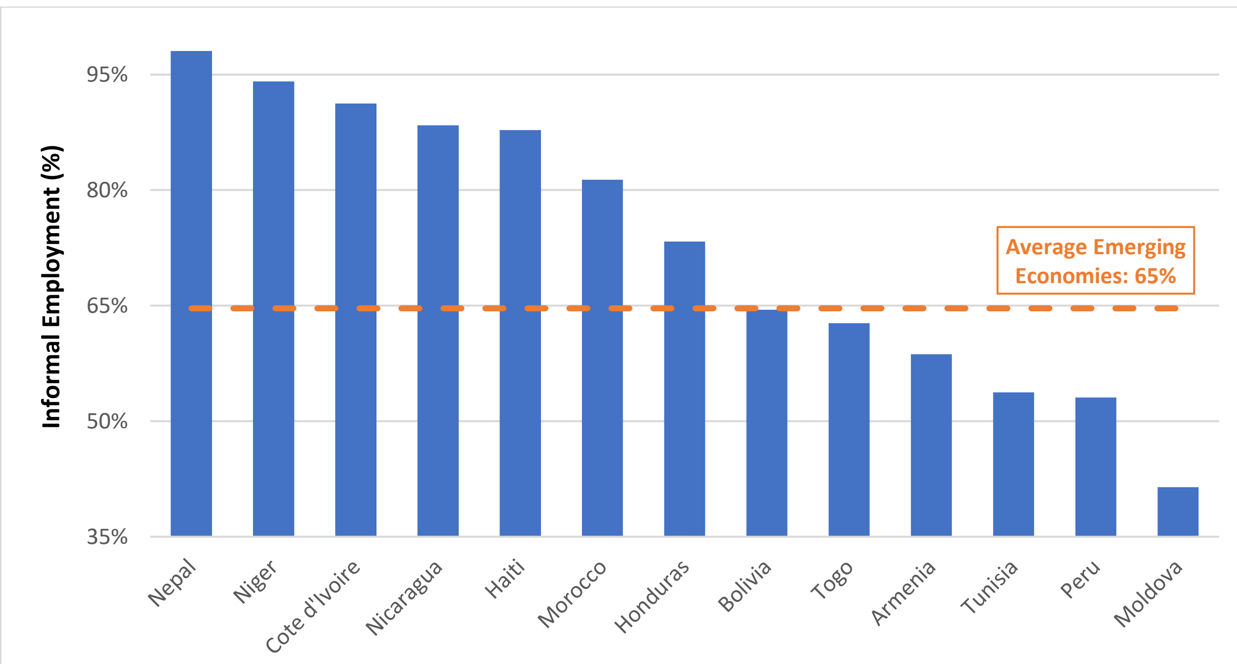
60. Technology increases proximity to markets, facilitating the creation of new, efficient value chains. Farmerline in Ghana is an online platform that communicates with a network of over 200,000 farmers in their native languages via mobile phone on the weather and market prices while collecting data for buyers, governments and development partners. The company is expanding to include credit services.

How the Demand for Skills is Changing

61. The affect of technology on the demand for skills is diverse across the world. First, the decline in manufacturing employment is often attributed to technological change. Second, technology is changing the skills that are being rewarded in the labor market. The premium for skills that cannot be replaced by robots and improve worker adaptability—namely general cognitive skills such as critical thinking, and socio-emotional skills such as managing and recognizing emotions that enhance teamwork—is rising. Third, technology is disrupting the production process by challenging the traditional boundaries of firms, expanding global value chains and changing the geography of jobs. Fourth, technology is changing how people work, giving rise to the gig economy where organizations contract with independent workers for short-term engagements.

62. These changes are more noticeable in advanced economies where technology is widespread and labor markets start from higher levels of formalization. But emerging economies have been grappling with many of the same issues for decades, even if not related to technological change. Informality persists on a vast scale in emerging economies—as high as 90 percent in some low and middle-income countries—notwithstanding technological progress. With some notable exceptions in Eastern Europe, informality has been hard to tackle (figure 1.2). In countries such as El Salvador, Morocco or Tanzania only one out of 5 workers is part of the formal sector. On average, two out of 3 workers in emerging economies are informal workers.

Figure 1.2. Two out of three workers in emerging economies are in the informal economy (selected countries)



Source: Authors' calculations using household and labor force survey data from the International Income Distribution Database.
Note: The figure presents selected countries with highest rates of informal employment. A person is identified as informal worker if he or she does not have a contract, social security, and health insurance; and is not part of a labor union. The estimates are for the latest available year for each country, ranging from 2010 to 2016.

63. The prevalence of informality predates the new millennium wave of technological change and continues to be the case. In fact, recent technological developments blur the divide between formal and informal work in some sectors in advanced economies. Various programs for reducing informality, inspired by Hernando de Soto's *The Other Path*, have yielded limited progress. The reason is the interaction of onerous regulations, taxes and social protection schemes, which means that businesses have no incentive to grow.

64. Technology is disrupting demand for three types of skills at work. First, returns to non-routine cognitive and socio-emotional skills appear to be rising, in both advanced and emerging economies.[23] Second, returns to job-specific skills that are routine are declining. Third, pay-offs to combinations of different skill-types appear to be increasing.

65. Since 2001, the share of employment in occupations intensive in non-routine cognitive and socio-emotional skills has increased from 19 to 23 percent in emerging economies, and from 33 to 41 percent in advanced economies. In Vietnam, within a given industry, workers performing non-routine analytical tasks earn 23 percent more; those on interpersonal tasks 13 percent more. In Georgia and Armenia, the earnings premium for problem solving and learning new things at work is close to 20 percent.[24]

66. Robots complement workers that engage in non-routine tasks that require advanced analytical, interpersonal or manual skills that require significant dexterity. For example, teamwork, relationship management, people management, care: these activities require people to react to one another based on tacit knowledge. Designing, producing art, conducting research, managing teams, nursing, cleaning have proven hard to automate. Robots have, for the most part, struggled to replicate these skills to compete with workers.

67. Machines, including robots, replace workers most easily when it comes to routine tasks that are "codifiable". Some of these tasks are cognitive, such as processing payrolls, book-keeping, or arithmetic. Others are manual or physical, such as operating welding machines, assembling goods, operating forklifts. These tasks can be easily automated. In Norway, broadband adoption by firms improved employment among skilled workers but worsened it among unskilled workers. The new technology complemented skilled workers in executing non-routine abstract tasks while substituting for unskilled workers.[25]

68. Pay-offs to combinations of different skill-types are also increasing. A rapidly evolving world of work demands skills-sets that improve the adaptability of workers, allowing them to transfer easily from one job to another. Across countries, both higher-order cognitive (technical) skills and socio-emotional skills are consistently ranked among the skills most valued by employers. Employers in Benin, Liberia, Malawi and Zambia rank teamwork, communication, and problem-solving skills as the most important set of skills after technical skills.[26]

69. Even within a given occupation, the nature of the skills needed to perform a job is changing. While the job of a personal assistant in 2018, for example, is quite different from what it was 15 years ago, the impact of technology on skills demand within occupations is not always in the direction one may expect. In Chile, the adoption of complex software used for client, production, and business management between 2007 and 2013 reallocated employment from skilled workers

to administrative, unskilled production workers. This shift led to an increase in the use of routine manual tasks and a reduction in the use of abstract tasks within firms.[27]

70. In advanced economies employment has been growing fastest in high-skilled cognitive occupations and low-skilled occupations that require dexterity. In contrast, employment has shifted away from middle-skilled occupations like machine operators. This is one of the factors that may translate into rising inequality in advanced economies. Both middle- and low-skilled workers could see falling wages: the former because of automation; the latter because of increased competition.

71. Few studies have taken place in emerging economies, but some show that similar changes in employment are taking place. In middle-income countries in Europe, for example Bulgaria and Romania, the demand for non-routine cognitive and interpersonal work is rising but there is no increase in low-skilled non-routine manual work.[28] Routine cognitive work has increased in other countries such as Botswana, Ethiopia, Mongolia, the Philippines and Vietnam.[29] Studies observe, in most cases, that the demand for non-routine cognitive and interpersonal skills is rising much faster than for other skills. High-skilled workers are gaining with technological change while low-skilled workers—especially those in manual jobs—seem to be losing out.

72. Other studies show that changes in employment have not had a negative impact overall on employment levels. In Argentina the adoption of information and communications technology in manufacturing increased employment turnover through the replacement of workers, elimination of occupations, creation of new occupations and a decrease in the share of unskilled workers. However, employment levels increased across all skill categories.[30]

73. Technology is changing the geography of jobs by disrupting production processes, challenging the traditional boundaries of firms and expanding global value chains. Other waves of technological change have done the same. The industrial revolution, which mechanized agricultural production, automated manufacturing and expanded exports led to mass migration of labor from farms to cities. The advent of commercial passenger planes expanded tourism from local holiday destinations in Northern Europe to new, foreign resorts on the Mediterranean Sea. Thousands of new jobs were created in new industries and new locations.

74. Improvements in transcontinental communication technologies, along with the fall in transportation costs, have expanded global value chains. This has supported the outsourcing of jobs to the developing world. Robots offer the possibility of "reverse offshoring", where automation in advanced countries replaces workers in jobs that otherwise would have been outsourced. Beyond technology, of course, many other factors matter for outsourcing. The Philippines overtook India in 2017 in terms of market share in the call center business at least partly due to lower taxes.

75. Technology can enable clusters of business to form in under-developed rural areas. In China rural micro e-tailers began to emerge in 2009 on Taobao.com Marketplace, which is owned by Alibaba and is one of the largest online retail platforms in China . These clusters—referred to as "Taobao Villages"—spread rapidly, from just 3 in 2009 to 2118 across 28 provinces in 2017. In 2017, there were 490,000 online shops. While sales have been strongest in traditional goods such as apparel, furniture, shoes, luggage, leather goods, or auto accessories, sellers are diversifying their offerings to include high-tech goods such as drones.[31]

76. Online work platforms eliminate many of the geographical barriers previously associated with certain tasks. Bangladesh contributes 15 percent to the global labor pool online with 650,000 freelance workers.[32] Indiez, founded in 2016 in India, takes a team-based approach to online freelancing. The platform provides a remotely distributed community of talent—mainly from India, Southeast Asia, and Eastern Europe—that works together on tech projects for clients anywhere in the world. Clients include the pizza restaurant, Dominos India, as well as the Indian multinational conglomerate, Aditya Birla Group. Wonderlabs in Indonesia follows a similar model.

77. Finally, technology is changing how people work and the terms on which they work. Rather than "standard" long-term contracts, digital technologies are giving rise to more short-term work, often via online work platforms. These so-called "gigs" make certain kinds of work more accessible to every individual on a more flexible basis. Increased access to digital infrastructure—via laptops, tablets, and smartphones—provides an enabling environment for on-demand services to boom. Examples range from grocery delivery, driving services to sophisticated tasks like accounting, editing, or music production. ASUQU in Nigeria connects creatives and other experts with businesses across Africa. CrewPencil works in the South African movie industry. Tutorama, based in Egypt, connects students with local private tutors. A student can also work as a Yandex driver in the Russian Federation whenever is most convenient with her university schedule. She can identify peak hours in different locations to achieve the highest level of passenger turnover.

78. The increased role for capital in production processes is associated with shortening job tenures. In European countries younger workers are most affected by the rise in temporary contracts. In Austria, the share of 25- to 29-year-old dependent workers with job tenures of less than one year increased from 16 in 2003 to 24 percent in 2015. In the same period such share increased from 19 to 28 percent in Ireland.[33] Part-time employment is on the rise in many places: since 2000, it went from five to 17 percent of total employment in Chile. A similar trend can be observed in temporary employment. In Poland, it it increased from 12 to 27 percent of total dependent employment in the past 15 years.

79. Many of these changes amount to a convergence in the nature of work between advanced and developing economies. Labor markets are becoming more fluid in advanced economies while informality persists in emerging economies. Most challenges faced by short-term or temporary workers, even in advanced economies, are the same as those faced by workers in the informal sector. Self-employment, informal wage work with no written contracts or protections and low-productivity jobs more generally are the norm in most of the developing world. Workers operate in a regulatory grey area, with most labor laws unclear on roles and responsibilities of the employer versus the employee. This group of workers often lacks access to benefits. There are no pensions, no health or unemployment insurance schemes, or other workers' protections.

80. This type of convergence is not what was expected in the 21st century. Traditionally, economic development is synonymous with formalization. This is reflected in the design of social protection systems and labor regulations. A formal wage employment contract is still the most common basis for the protections afforded by social insurance programs and by regulations such as minimum wages or severance pay. Changes in the nature of work caused by technology shifts the "standard" pattern of demanding workers' benefits from employers to directly demanding

welfare benefits from the state. These changes raise questions about the continuing relevance of current labor laws, forcing a debate on the need for a new social contract.

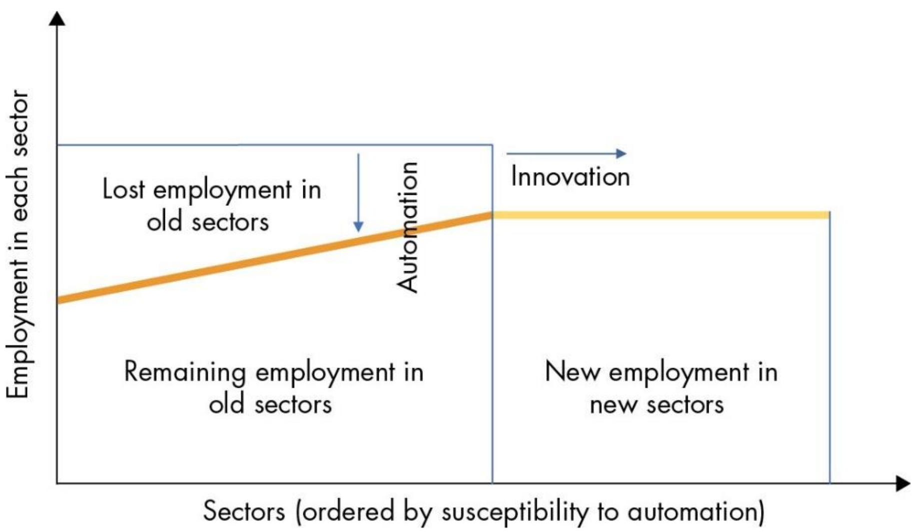
A Simple Model of Changing Work

81. Will robots turn the old Luddite fears of machine-replacing-man into reality? Will massive automation mean that the old path of prosperity-through-industrialization, once taken by England, Japan and China, is now closed? How can public policy ensure that the evolution of work produces a world that is both more prosperous and more equitable?[34]

82. Keynes correctly understood that employment in traditional sectors, especially in agriculture, would decline enormously in the 20th century, but he failed to anticipate the explosion of new products that 21st century workers would produce and consume. Most importantly, he failed to foresee the vast service economy that would employ workers in most wealthy countries.

83. Breakthroughs, like digital technologies, enable firms to automate, replacing labor with machines in production, and to innovate, expanding the number of tasks and products. The future of work is determined by the battle between automation and innovation (figure 1.3). Automation causes the employment in old sectors to decline; innovation causes new sectors or tasks to emerge. The overall future of employment depends on both of them. It also depends on the labor and skills intensity of the new sectors or tasks that emerge. These forces will, in turn, affect wages.

Figure 1.3. The forces of automation and innovation will shape employment



Source: Authors.

84. For most of the past 40 years, human capital has been a shield against automation, partly because machines have more difficulty replicating more complex tasks. Low-skilled and middle-skilled workers have benefited less from technological change either because of higher susceptibility to automation or because of lower complementarities with technology.[35] The ordering of the sectors in figure 1.3 can be understood as running from most automatable to least automatable, or from low-skilled and middle-skilled jobs to high-skilled for the cases where there is a decline in relative demand for some less educated workers.

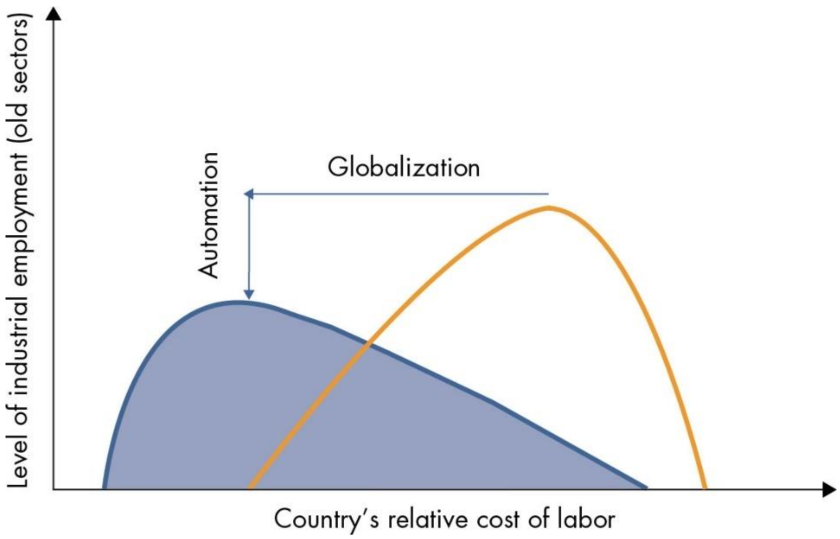
85. Automation has disproportionately reduced demand for less skilled workers. The innovation process has generally favored the more educated. A big question is whether the workers displaced by automation will have the skills needed to work in the jobs created by innovation. This study focuses a great deal on the necessity of human capital for the workforce of the future. Yet it is worth remembering that many innovations, like Henry Ford's assembly lines, increased demand for less skilled workers, while others, like quartz watches, disproportionately destroyed highly skilled jobs.

86. Automation and innovation can be largely unexpected by-products of a single breakthrough, like the advent of the internet, or the result of more targeted investments by companies that either seek to reduce labor costs or increase profits in new markets. If public regulations limit innovation, or if tax policies privilege cost-cutting, employment is more likely to fall.

87. Automation through dishwashers and washing machines revolutionized homes in the mid-20th century, enabling millions of women to work outside the household. They often found jobs in the service economy, which grew by providing yet more products, from caffè lattes to financial planning, and enabling an even finer division of labor, with personal trainers and pre-prepared gourmet food. A major question for this century is whether more of these services will become tradeable or whether service workers will need to work, as of now, in the same metropolitan area as their clients.

88. The battle between innovation and automation rages not only in the American and European rustbelts, however. Even though low wage countries may not invest in the development of labor-saving innovations, they may import labor-saving ideas from advanced economies. In fact, the mechanization of agriculture in emerging economies may represent the largest global shift in work. Cities in emerging countries must generate abundant new jobs to employ the farmers displaced by the industrialization of agriculture. Declining costs of transportation and connectivity, which we call globalization, should enable these urban job markets to expand, as long as increased connectivity moves more quickly than the automation of tradable good production. So, while the growth of employment in emerging economies can be supported by global value chains, automation may mean that African countries never experience mass industrialization (figure 1.4).

Figure 1.4. The impact of automation and globalization on industrial employment



Source: Authors.
Note: The curves are inverse u-shaped to reflect the empirical regularity that manufacturing employment is a larger share of employment in middle-income countries; higher-income countries tend to specialize in services; low-income countries have a relatively higher share of employment in agriculture.

89. High labor costs in relation to capital — beyond a certain level — push firms to automate production or to move jobs to lower cost countries. This reduction in costs is achieved explicitly within a firm or implicitly through competition within a market. The relative cost of labor, rather than income, is emphasized because countries can have labor costs that are not aligned with their income level. This can be the case when low levels of human capital render workers unproductive, reducing exporting potential; or in countries where regulations significantly raise labor costs for formal employers.

90. Globalization leads to more jobs moving to developing world cities, reducing overall relative costs of labor (shifting the curve in figure 1.4 leftward). Automation leads to less demand for manufacturing workers everywhere for relative labor costs (shifting the curve downward). Automation also changes the overall relationship between industrial employment and labor costs as it will happen more quickly in places with high labor costs if incentives dominate other differences between these locations (changing the shape of the curves in figure 1.4 from left-skewed to right-skewed).

91. The dramatic economic growth experienced by Japan, the Republic of Korea, China, and Vietnam, started with the fruits of globalization: manufacturing exports that competed effectively because of low labor costs. These countries chose policies investments in infrastructure, special economic zones, and above all, human capital, that generated a high quality, low cost labor force connected to the outside world.

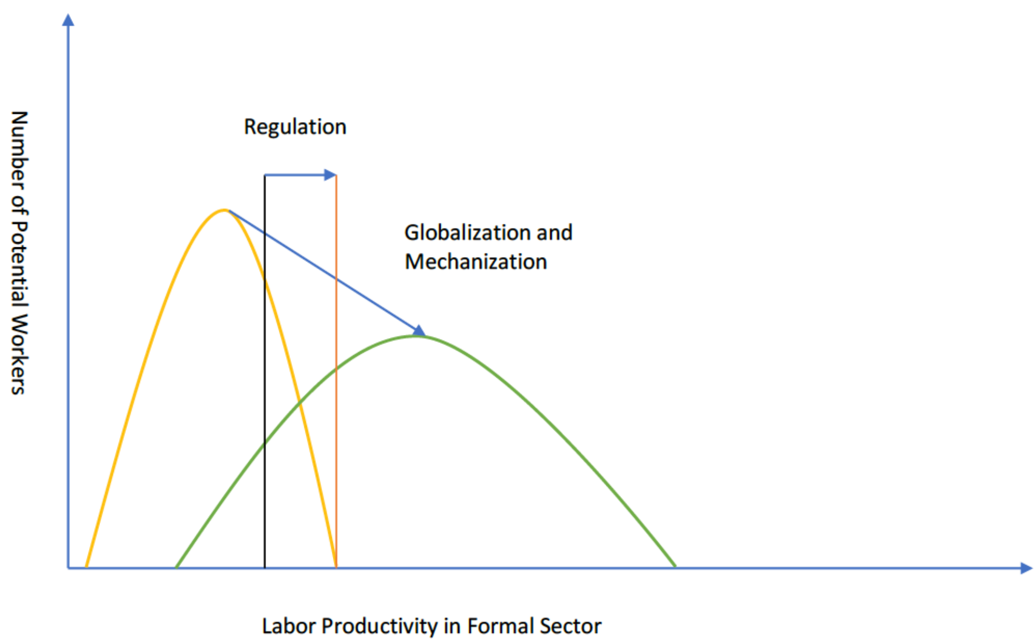
92. Shenzhen's transformation from labor-intensive, low-cost manufacturing to high skilled, technologically intense production illustrates the challenge that later industrializers now face. They must compete not only with the high labor cost, capital-intensive producers of the wealthy west, but also the moderate labor cost, technology-intensive producers of Asia and Eastern Europe. If

robust global connections come too slowly to Africa, then industrialization may no longer be a plausible path for job creation and growth. This threat strengthens the case for investing rapidly in the precursors of globalization—education and transportation infrastructure.[36]

93. In that case, Africa may urbanize as a service-producing economy, leap-frogging to the employment model that is prevalent today in the United States and Europe. African cities are already centers of service production, but export earnings come from natural resources and agriculture. The future of work in developing economies depends significantly on the ability to export services to the wealthy world. To get on a growth path, developing world cities must identify types of service provision, such as call centers and tourism hubs, that enable them to sell to the wealthy world. Rural areas in the developing world may become more productive, but as farming becomes far less labor intensive, they are also likely to become far less populated.

94. If African cities maintain the current model, employment will remain in a low-wage, informal service sector. Changing the current model depends significantly on investments in human capital (figure 1.5).

Figure 1.5. The role of human capital in shaping productivity and wages in emerging economies



Source: Authors.

95. Figure 1.5 shows globalization increasing the returns to human capital through higher labor productivity, because some workers participate in export industries and because the shift of workers to those industries increase the demand for all kinds of labor. This positive shift is meant to capture the positive experience of a poorer nation that has suddenly gained access to significant foreign direct investment. Naturally, globalization may not always raise productivity across the board.

96. This figure assumes that the benefits of globalization will not accrue evenly and will cause the variance of labor productivity to increase. While productivity for subsistence farmers may be low and relatively homogeneous, the returns to participating in a globalized economy can be far more mixed. By investing strongly in raising the human capital of their citizens, governments can help to avoid the negative aspects.

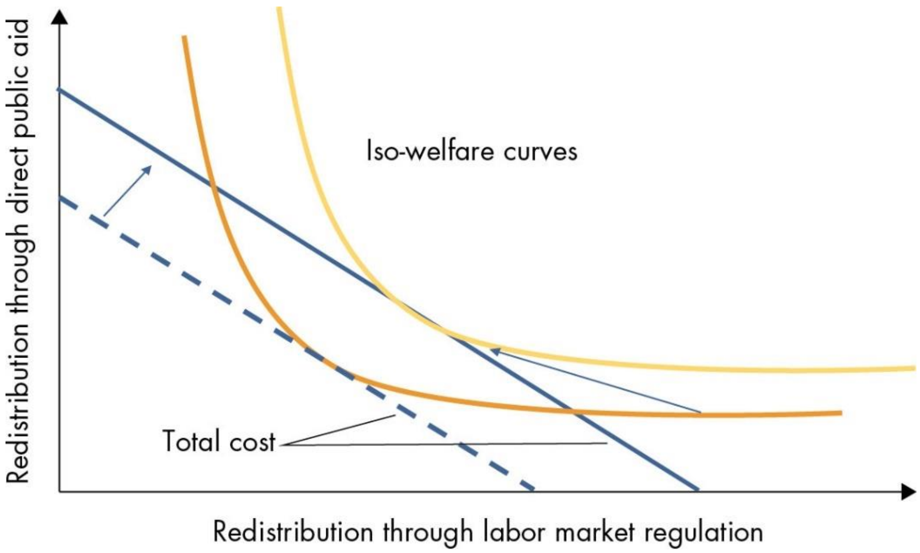
97. The vertical lines in figure 1.5 denote the minimum productivity level at which firms find it optimal to employ workers formally, before the move towards globalization. Minimum wages, required benefits, along with other taxes and regulations ensure that informality is appealing for all but the most productive workers before the economy grows. Figure 1.5 illustrates that, if regulations stayed constant, globalization and automation would in many cases pull more workers into the formal sector by increasing their productivity. Yet this formal employment effect may be reduced if development and exposure to the wealthy world leads countries to impose more requirements on firms. Globalization may raise incomes, but it may not do much to reduce informality if regulatory aspirations increase along with global connections. Indeed, informality could even rise if globalization sufficiently increases regulation and inequality.

98. Finally, policymakers need to think about risk management because of the predominance of informality in developing countries and the higher uncertainty associated with the changing nature of work. The large continuing presence of a vast informal service sector challenges risk management systems that function through employers. Financing pensions and other forms of insurance through payroll taxes that can be levied only from formal workers does little good if these workers represent only a small share of the workforce. Strong requirements can also deter formalization.

99. This report emphasises the need for a new social contract for all workers regardless of how or where they work. Governments can strengthen social protection and reduce inequality through requirements or subsidies for employer-provided support, such as minimum wages, employer-provided health care or protection against dismissal. Alternatively they can through direct, state-provided support in the form of social assistance programs and subsidized universal social insurance (which we call "direct public aid").

100. Both types of social policy can promote equity. Both have costs. From the state's perspective there are different combinations of regulations and public aid that can generate the same level of equity. Direct public aid generates implementation costs through waste and higher tax rates (figure 1.6). Employer requirements deter hiring and could, when too stringent, raise inequity by increasing the share of workers who are either unemployed or in the informal sector.

Figure 1.6. Protecting workers



Source: Authors.

101. We show these costs with two cost lines. The blue iso-cost lines shows the set of points that generate the same level of direct public implementation costs. The line is relatively flat, because a small reduction in the level of direct redistribution reduces these costs by enough to offset a large increase in labor market regulation. The grey iso-cost line shows the set of points that generate the same level of market distortion costs. In this case, the slope is steep, since a small increase in the level of labor market regulation increases distortionary costs by as much as a large decrease in the public safety net. The total cost curve sums these two cost curves. Social welfare is maximized at the point in which the iso-cost line are tangent to the iso-welfare curve.

102. Many developing world countries initially chose to redistribute primarily through labor market regulations, because the costs of distorting labor markets were low and public capacity for social programs was limited. If automation causes the cost of distorting labor markets to rise, and development improves the efficacy of the public sector, then the cost curve can become steeper. That shift calls for a new social welfare contract that moves away from regulation-based redistribution to direct social welfare support.

103. The future world of work is uncertain. Innovation might outrace automation. Globalization may move quickly enough so that industrialization can allow Africa to grow and prosper. Yet, given the considerable uncertainty about the future of employment, governments should rethink policies that deter job creation as well as emphasize policies that protect the vulnerable while still encouraging employment.

Chapter 2: Building Human Capital

104. The world is healthier and more educated than ever. In 1980, only five in ten primary-school-aged children in low-income countries were enrolled in school. By 2015 this number had increased to 8 in 10.[37] In 1980 only 84 out of 100 children reached their fifth birthday, compared with 94 out of 100 in 2018. A child born in the developing world in 1980 could expect to live for 52 years. In 2018 this number is 65 years.

105. However, a large unfinished agenda remains. Life expectancy in the developing world still lags far behind rich countries like South Korea, where a girl born in 2018 can expect to live more than 85 years. Nearly a quarter of children under five are malnourished.[38] In many places, the working memory and executive functions such as sustained attention of poor children start to lag behind as early as at six months of age.[39] Globally, more than 260 million children and youth are not in school.[40] Nearly 60 percent of primary school children in developing countries fail to achieve minimum proficiency in learning.

106. Human capital consists of the knowledge, skills and health that people accumulate over their lives, enabling them to realize their potential as productive members of society. Human capital has large payoffs for individuals, societies and countries. This was true in the 1700s when Adam Smith wrote, "The acquisition of…talents during…education, study or apprenticeship, costs a real expense, which [is] capital in [a] person. Those talents [are] part of his fortune [and] likewise that of society."[41] This is still true in 2018.

107. For individuals, an additional year of school generates eight to ten percent higher earnings on average. These returns are large in low- and middle-income countries, especially for women. However, what children actually learn matters more than how long they stay in school. In the United States replacing a low-quality teacher in an elementary school classroom with an average-quality teacher raises the combined lifetime income of that classroom's students by US$250,000.[42]

108. Returns to education are high when technology is changing. During the Green Revolution in India in the 1970s-80s better educated farmers adopted new technologies.[43] In Mexico the benefits of increased labor productivity resulting from the North American Free Trade Agreement were concentrated among more skilled workers.[44] In the current era of rapid technological change human capital is more important than ever. Despite the higher supply of educated workers, returns to investments in education have increased since 2000.[45] People with higher human capital adapt faster to technological change. Future success depends on working with machines, not fearing them. It takes human capital to do this well.

109. Socio-emotional skills such as aptitude for teamwork, empathy, conflict resolution and relationship management can be developed to enlarge a person's human capital. Globalized and automated economies put a higher premium on human capabilities that cannot be fully mimicked by machines. Abilities such as grit have economic returns that are often as large as those associated with cognitive skills.[46]

110. Health is an important component of human capital. People are more productive when they are healthier. In Nigeria a program providing malaria testing and treatment increased workers'

earnings by ten percent in just a few weeks.[47] A study in Kenya showed that deworming in childhood reduced school absence while raising wages in adulthood by as much as 20 percent, all thanks to a pill that costs 25 cents to produce and deliver.[48]

111. Starting at an early age, different dimensions of human capital complement each other. Proper nutrition in-utero and in early childhood improves children's physical and mental well-being.[49] Evidence from the United Kingdom shows that healthier diets for school children significantly increased their achievements in English and science.[50] In a multi-country study, underweight as well as obese children had lower IQ scores than healthy weight children.[51] Providing mathematics-based games to pre-schoolers in India generated enduring improvements in students' intuitive abilities.[52]

112. The benefits of human capital transcend private returns, extending to others and across generations. Deworming one child decreases the chances of other children becoming infected with worms, which in turn sets those children up for better learning and higher wages.[53] Maternal education, through increased prenatal care, improves infant health.[54] In Pakistan, children whose mothers have even a single year of education spend an extra hour a day studying at home.[55]

113. All of these individual returns to human capital add up to large benefits for economies. Between ten and 30 percent of per capita income differences can be attributed to cross-country differences in human capital.[56] This percentage could be even higher when taking into account the quality of education or the interactions between workers with different skills. By generating higher incomes, human capital helps to reduce poverty.

114. Human capital matters for societies. In the mid-1970s Nigeria introduced universal primary education, sending a large cohort of children through primary school who otherwise would not have gone. Years later those same people were found to be more engaged in political life. They paid closer attention to the news, spoke to their peers about politics, attended community meetings and voted more often.[57] Preliminary evidence from the *National Volunteer Service Program* in Lebanon, an inter-community soft-skills training program supported by the World Bank, shows that young participants displayed higher levels of overall tolerance. As the scientist Marie Curie once said, "You cannot hope to build a better world without improving individuals".

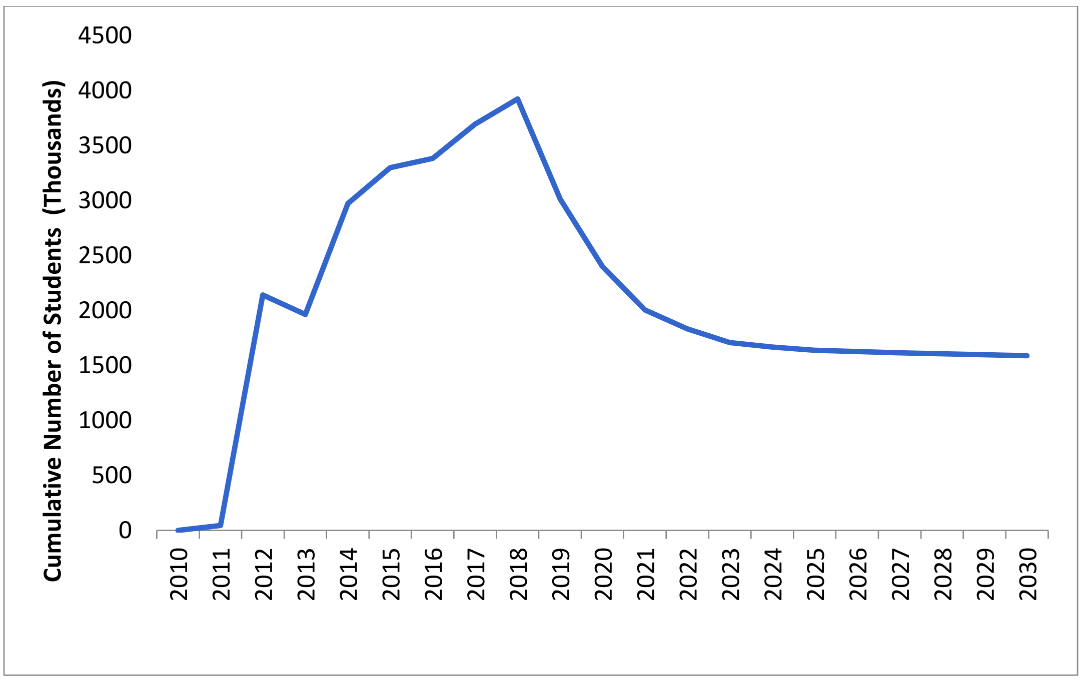
115. Human capital also fosters social capital. Surveys typically find that more educated people are more trusting of others. Research suggests that the large wave of compulsory school reforms that took place across Europe in the mid-20th century made people more tolerant of immigrants than they were before.[58] Social capital in turn is associated with higher economic growth.[59]

116. Increased human capital reduces crime and violence. In Mexico, high school dropouts are significantly more likely to be caught up in drug-related violence.[60] In Liberia men at risk of committing acts of violence were enrolled in cognitive behavioral therapy program to stimulate social skills. Their self-control as well as ability to navigate difficult emotional situations improved. When combined with a small cash transfer, the program significantly reduced the likelihood that these men would become violent.[61] Social insurance programs such as India's *National Rural Employment Guarantee Scheme* have been linked to decreased violence by offering alternative sources of income to those who might be tempted to join local insurgencies.

117. Failing to protect human capital undermines social cohesion. A study of the Ebola epidemic throughout Western Africa found that people in newly-affected areas had less trust in authorities and were more likely to take part in riots and violence.[62] Even less severe conditions such as malaria can have an impact: malaria outbreaks across the African continent have been shown to increase the incidence of riots and protests, with the prospect of a life of ill health and low incomes leading to violence.[63] The stakes can be even higher than this: a country's disease environment, particularly its exposure to epidemics, increases its chance of tipping into civil conflict.

118. Human capital is one of the first things to suffer when things fall apart. Wars can prevent whole generations from realizing their potential. World Bank estimates for Syria show that between 2011 and 2017 almost four million children left school because of the civil war. Many of them are likely never to make-up for these lost years of school (figure 2.1).

Figure 2.1. Children not in school due to war in Syria



Source: World Bank 2017a.
Note: Background analysis for World Bank 2017 "The Toll of War: The Economic and Social Consequences of the Conflict in Syria". The number of children not in school between 2011 and 2017 is based on estimates of actual declines in school enrollment relative to pre-war trends and on the assumed impact war posed on student enrolment. The scenario from 2018 onwards explores the long-term consequences of these trends by assuming that school enrollment rates gradually return to pre-war trends and corrects for population dynamics of refugee in-and-out flows; if they follow similar behaviors of past international conflicts. Similar assumptions are also made for Internally Displaced Persons but with higher return rates during the first few years of the end of the war.

Why Government is Needed

119. Individuals and families often underinvest in human capital because they cannot afford the costs. Even when human capital investments are affordable individual decisions may be shaped by lack of information, or restricted due to prevalent social norms. Individuals also don’t take into account the wider social benefits for others. For these reasons governments have a crucial role to play in fostering human capital acquisition and in ensuring that the benefits of human capital are widely shared.

120. Many disadvantaged families cannot afford to invest in better health and education for their children even when they want to. This is clearly seen in how families spend their money once budget constraints are even slightly relaxed. In Sierra Leone, only 3-4 months after the introduction of a public works program that increased income, participating families significantly increased their spending on health services, especially for children.[64]

121. Even when education is free the cost of transportation and school supplies, together with foregone earnings while in school, make education prohibitively expensive. Many poor rural families cannot afford the time it takes to travel to the nearest school or medical facility. In Niger only 24 percent of the population lives within a one-hour walk of the nearest medical facility during the wet season.[65]

122. In cases like these government interventions can make a big difference. Cash transfers programs have improved the health and education of millions of children in low- and middle-income countries even when they provided only partial subsidies for the cost of schooling. *Shombhob*, a conditional cash transfer piloted in Bangladesh, reduced wasting among children aged 10-22 months and improved mothers’ knowledge about the benefits of breastfeeding.[66] The effects of these programs last over time. A two-year conditional cash transfer program in Malawi targeting adolescent girls and young women produced a large increase in educational attainment and a sustained reduction in the total number of births in girls who were out of school at the start of the program. This persisted after the program ended.[67]

123. Some parents underinvest in their children because of social norms. This is particularly evident for girls.[68] Infant mortality among girls increases more than it does for boys during economic downturns.[69] Lower investment in girls’ health has effects that last a lifetime. A study in Indonesia found that girls—but not boys—whose families experienced adverse income shocks completed less school and ended up poorer as adults.[70]

124. People also underinvest in human capital because they do not always do what is in their long-term interest. Young people might not want to stay in school or take care of their health because they lack self-control or do not fully appreciate the benefits. Providing information about human capital can have large effects on behavior. In the Philippines young people were offered a voluntary commitment program in which their savings were returned only if the person passed a smoking cessation test. The program resulted in a significant reduction in smoking.[71]

125. Human capital investment generates significant social returns but these are often hard for parents to quantify, let alone factor into their decisions. When deciding to deworm their children, parents may not take into account the fact that other children will also be less likely to be infected.

Parents deciding to send their children to pre-school may not consider wider future societal benefits such as lower crime and incarceration rates that have been associated with early childhood development programs. A 2010 study of Perry Pre-school, a high-quality program for three- to five-year-olds developed in Michigan, United States, in the 1960s, estimated a return to society over and above the private return of about US$7-12 for each dollar invested.[72] Without government interventions families might not choose to invest enough in these types of programs.

126. Ensuring access to those services closes early gaps in cognitive and socio-emotional skills.[73] By the age of three, children from low-income families have heard 30 million fewer words than their more affluent peers. As children turn into teenagers, interventions to close these gaps become more expensive.[74]

127. Evidence suggests that, for governments looking to make effective investments in human capital, there is no better proposition than investing in the "first thousand days" of a child's life. Without these interventions early in life, a de-equalizing spiral can result: the benefits of subsequent public investments in education and health are more likely to benefit people who start out better off. In Mexico, 45 percent of public spending on tertiary education accrues to students from the top income quintile.[75]

128. Government actions to support investment in human capital go well beyond spending on health, education and social protection programs. Other public investments can play an important complementary role in levelling the field. Evidence from Nepal shows that sanitation significantly contributes to preventing anemia.[76] Housing programs improve the education and labor market outcomes of the most disadvantaged by changing the quality of the peers with whom they interact. The effects tend to be stronger the earlier children are exposed to the better off neighbors.[77]

Why Governments Often Fail and Why Measurement Can Help

129. Governments have a vital role to play in building human capital: as providers of health, education and financing to ensure equitable access to opportunities; and as regulators for accreditation and quality control of private providers. But governments often fail to deliver. Most governments commit a significant share of their budgets to education and health. But public services often fail to deliver the quality needed to generate human capital. Sometimes they fail only the poor. Sometimes they fail everyone—and the rich simply opt out of the public system.

130. Shortfalls in quality persist for two reasons. First, pursuing good policies doesn't always pay off politically. Second, bureaucracies lack the capacity or incentives to convert good policies into effective programs. If public health is not politically relevant until there is a health crisis, politicians have little reason to prepare for future pandemics. Even when there is consensus among politicians and voters on the importance of an issue, there may be disagreement about the solution. Rarely is it popular to fund public health programs by raising taxes or by diverting money from more visible expenditure, such as infrastructure or public subsidies.

131. The government of Nigeria encountered resistance in 2012 when it tried to repeal fuel subsidies to spend more on maternal and child health services. Media focused on the unpopular subsidy repeal and paid scant attention to the much-needed expansion of primary health care. Because of public protests The subsidy was reinstated because of public protests. This can happen

in some countries as a result of the power of organized interests that stand to lose from reforms. In others it happens because of a weak social contract: citizens do not trust their government, so they are hesitant to pay taxes which they worry will be misspent. The consequence is that governments might underspend or favor spending on the politically visible aspects of human capital such as constructing schools and hospitals but spend much less on intangible aspects—such as the quality and competence of teachers and health workers. Campaigning politicians often promise new schools or hospitals but rarely discuss actual learning levels or stunting rates.

132. Human capital investments might not produce economic returns for years, making politicians think of shorter-term ways to burnish their reputations. While people with basic education earn more than people with no education, labor market returns for basic education are not realized until ten-15 years after these investments are made. This is even more the case for investments in early childhood education. The provision of psychosocial stimulation to toddlers increased earnings by 25 percent in Jamaica, but these returns only materialized 20 years later.[78]

133. Bureaucracies charged with implementing policies to build human capital often lack the capacity or the incentives to do so effectively. Service Delivery Indicators (SDI) surveys in seven Sub-Saharan African countries (together representing close to 40 percent of the continent's population) found that, on average, three out of ten fourth-grade teachers had not mastered the language curriculum they were teaching. On a positive note: 94 percent of Kenyan teachers had done so.

134. In healthcare facilities, SDI surveys paint an equally mixed picture: while about 80 percent of Kenyan doctors could correctly diagnose a basic condition such as neonatal asphyxia, fewer than 50 percent of Nigerian doctors were able to do so.[79] In the countries surveyed, on average, teachers taught for only half of the time they were supposed to spend teaching. Evidence from rural India points at the limited accountability for doctors in public health clinics as potential explanation for why they exert significant lower effort than doctors in private practices.[80] For teachers and doctors working in politicized bureaucracies—where jobs and promotions are based primarily on political connections—the lack of motivation may not be surprising. Successful reforms often therefore require more than technical considerations. Success also requires understanding the incentives of bureaucrats and aligning them with program objectives.

135. Better measurement helps when lack of quality in delivering social services is the result of political or bureaucratic failures. Information is an essential first step for citizens to demand more from their leaders and service providers. In Uganda releasing report cards on the performance of local health facilities galvanized communities to press for service delivery reforms. This in turn led to sustained improvements in health outcomes, including a reduction in mortality for children under five.[81]

136. Better measurement increases the importance of human capital investment among policy makers, creating momentum for action. Twaweza, a Tanzanian NGO supported by the World Bank, launched a survey to assess children's basic literacy and numeracy. The dismal results—released in 2011—showed that only three out of every ten third-grade students had mastered second-grade numeracy and even fewer could read a second-grade story in English.[82] The World Bank's own Service Delivery Indicators, released around the same time, shone a spotlight on the low levels of teacher competence and high levels of absenteeism. Together these results led to

substantial public outcry and the introduction of Tanzania's "Big Results Now" initiative, a government effort to track and address low levels of learning. The World Bank has been supporting these reforms through a program linked specifically to learning outcomes. It is already leading to tangible results.

137. More information is needed to design and deliver cost-effective policies, even when there is full willingness to invest in human capital. Peru and Vietnam have implemented ambitious policies to improve human capital. Nevertheless, comparative evidence based on a unique longitudinal dataset—the Young Lives survey—shows that cross-sectional gaps in test scores between these countries are modest at pre-school ages but grow substantially in the first 2-3 years of schooling, indicating that the productivity of the two schools systems are very different.[83] Only a comprehensive measurement of the factors that contribute to individual learning can help understand the reasons behind this differential. Once the gaps have been identified, cost-effective policies have to be designed and brought to scale. The World Bank, together with other national and international development organizations, has been advocating for and regularly implementing rigorous impact evaluations in order to assess the effectiveness of human capital enhancing policies. These studies should become the norm.

The Human Capital Project

138. Credible measurement of education and health outcomes, and effective communication of the findings, can raise the importance of human capital locally, nationally and globally. Measurement can spur the demand for policy interventions to build human capital in countries where governments are not doing enough. Good measurement is essential to developing research and analysis to inform the design of policies that improve human capital.

139. With this goal in mind, the World Bank has launched a Human Capital Project (HCP)—a program of advocacy, measurement, and analytical work to raise awareness and increase demand for interventions to build human capital. The HCP has three components: (i) a cross-country metric—the Human Capital Index (HCI), (ii) a program of measurement and research to inform policy action, and (iii) a program of support for country strategies to accelerate investment in human capital.

140. The first step in the HCP is an international metric to benchmark the key components of human capital across countries.[84] The new HCI measures the amount of human capital that a child born today can expect to attain by the end of secondary school, given the risks of poor health and poor education that prevail in the country where she was born. The HCI is designed to highlight how improvements in current health and education outcomes shape the productivity of the next generation of workers, assuming that children born today experience over the next 18 years the educational opportunities and health risks that children in this age range currently face. Focusing on outcomes—and not inputs such as spending or regulation—helps to concentrate attention on results, which is what really matters. It also makes the HCI relevant to policymakers who design and implement interventions to improve these outcomes in the medium-term.

141. The HCI follows the trajectory from birth to adulthood of a child born today. In the poorest countries in the world there is a significant risk that the child does not even survive to her fifth birthday. Even if she does reach school age there is a further risk that she does not start school, let

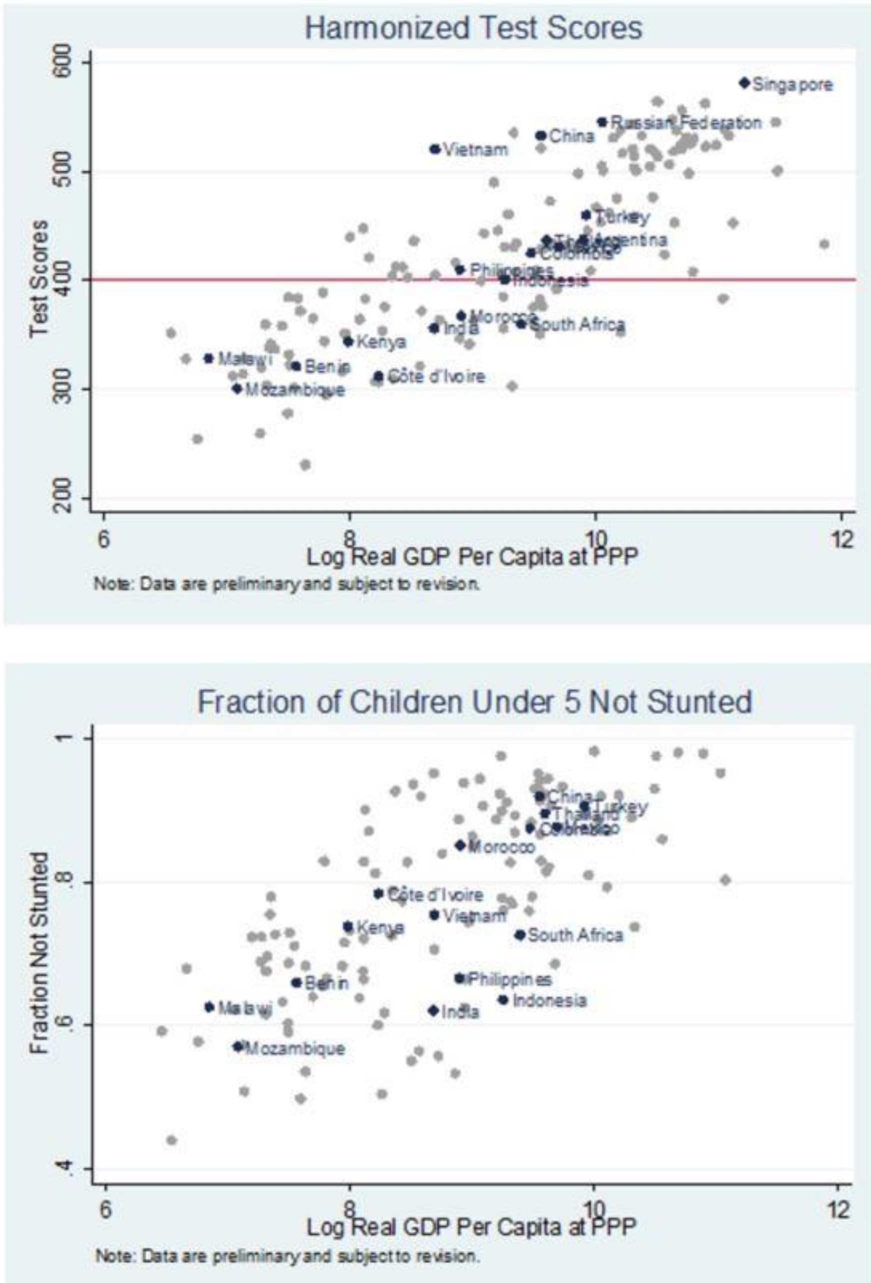
alone complete the full cycle of education through Grade 12 that is the norm in rich countries. The time she does spend in school may translate unevenly into learning, depending on the quality of teachers and schools she experiences or the support she has from her family. When she reaches her 18th year she carries with her the lasting childhood effects of poor health and nutrition that limit her physical and cognitive abilities as an adult.

142. The HCI quantifies the milestones in this trajectory in terms of their consequences for the productivity of the next generation of workers, using three components: a measure of whether children survive from birth to school age; a measure of expected years of quality-adjusted school, which combines information on the quantity and quality of education (figure 2.2); and two broad measures of health—stunting rates (figure 2.2) and adult survival rates.

143. Survival to the age of five is measured using under-5 mortality rates taken from the UN Child Mortality Estimates. Nearly all children survive from birth to school age in the richest countries. But in the poorest as many as one in ten do not see their fifth birthday.

144. The quantity of education is measured as the expected number of years of school that a child can expect to obtain by her 18th birthday, given the prevailing pattern of enrollment rates across grades. This measure is constructed with the assumption that all children should have the opportunity to complete 12 years of primary and secondary school, preceded by two years of pre-school. The best possible outcome occurs when 100 percent of eligibile children are enrolled in each level of school, resulting in 14 expected school years. High enrollment rates throughout the school system bring many rich countries close to the 14-year benchmark. But in the poorest countries, children can expect to complete only half that.

Figure 2.2. Two components of HCI



Source: Authors' calculations.

145. The World Bank Group and partners are developing a comprehensive new database of international student achievement test scores covering over 150 countries to benchmark what children learn. The database harmonizes results from international and regional testing programs to make them comparable so that, for the first time, learning can be measured in nearly all countries in the world using the same yardstick.[85] The differences in learning are dramatic. Country-level average test scores range from around 600 in the best-performing countries to below 200 in the

worst-performing. To put these numbers in perspective, a score of roughly 400 corresponds to a benchmark of minimum proficiency set by PISA, the largest international testing program. Fewer than half of students in developing countries meet this standard, compared with 86 percent in advanced economies. In Singapore, 98 percent of students reached the international benchmark for basic proficiency in secondary school; in South Africa, only 26 percent of students met that standard. This means essentially that all of Singapore's secondary school students are prepared for post-secondary education and the world of work, while almost three-quarters of South Africa's young people are not.

146. For health there is no single directly-measured, and widely-available metric comparable to years of school as a measure of educational attainment. In the absence of such a measure two proxies for the overall health environment make up this component of the index: adult survival rates and the rate of stunting for children under the age of five. Adult survival rates can also be interpreted as a proxy for the range of non-fatal health outcomes that a child born today is likely to experience as an adult if current conditions prevail into the future. Stunting measures the fraction of children who are unusually small for their age. It is broadly accepted as a proxy for the pre-natal, infant and early childhood health environment and it summarizes the risks to good health that children are likely to experience in their early years—with important consequences for health and well-being in adulthood.

147. The health and education components of human capital described have intrinsic value that is undeniably important—but also undeniably difficult to quantify. This makes it challenging to combine the different components into a single HCI that meaningfully reflects their contribution to human capital. Many existing indexes of human capital and human development resort to arbitrary aggregation of their components. But the components of the HCI are aggregated by first transforming them into measures of their contribution to worker productivity, relative to a benchmark corresponding to full health and complete education. This approach follows the large development accounting literature.[86] The size of the contributions of health and education to worker productivity is anchored in the large micro-econometric literature on estimating returns to education and health.

148. The HCI is measured in terms of the productivity of the next generation of workers, relative to the benchmark of complete education and full health. This gives the units of the index a natural interpretation: a value of x for a particular country means that the productivity as a future worker of a child born in a given year in that country is only a fraction x of what it could be under the benchmark of complete education and full health (table 2.1). This can be divided into the contributions of the three components of the HCI, each of which is also expressed in terms of productivity relative to the benchmark and are multiplied together to arrive at the overall HCI. Differences in human capital have large implications for the productivity of the next generation of workers. In a country around the 25th percentile of the distribution of each of the components, a child born today will be only 44 percent as productive as she would be in the benchmark of complete education and full health.

Table 2.1. Measuring the productivity as a future worker of a child born today

(Maximum productivity = 1)

		A country in the 25th Percentile	50th Percentile	75th Percentile *for component _, has a value of …*
	Component 1: Survival			
1	Probability of Survival to Age 5	0.95	0.98	0.99
A	*Contribution to Productivity*	0.95	0.98	0.99
	Component 2: School			
	Expected Years of School	9.9	12.2	13.9
	Test Scores *(out of approx. 600)*	358	425	505
2	Quality-Adjusted Years of School	5.9	8.6	11.2
B	*Contribution to Productivity*	0.52	0.65	0.80
	Component 3: Health			
3	Fraction of Kids Not Stunted	0.67	0.77	0.90
4	Adult Survival Rate	0.79	0.87	0.92
C	*Contribution to Productivity**	0.88	0.92	0.96
	Overall Human Capital Index**	**0.44**	**0.59**	**0.76**

Source: Authors' calculations.
Note: Contribution to productivity measures how much each component of the HCI, as well as the overall HCI, contributes to the expected future productivity of a worker of a child born today, relative to the benchmark of complete education and full health. A value of x means that productivity is only a fraction x of what it would be under the benchmark of complete education and full health. Estimates of productivity contributes are anchored in microeconometric evidence on the returns to education and health. Quality-adjusted years of school is product of test score relative to global best times expected years of school.
*: C is calculated as the geometric average of 3 and 4's contributions to productivity.
**: A x B x C

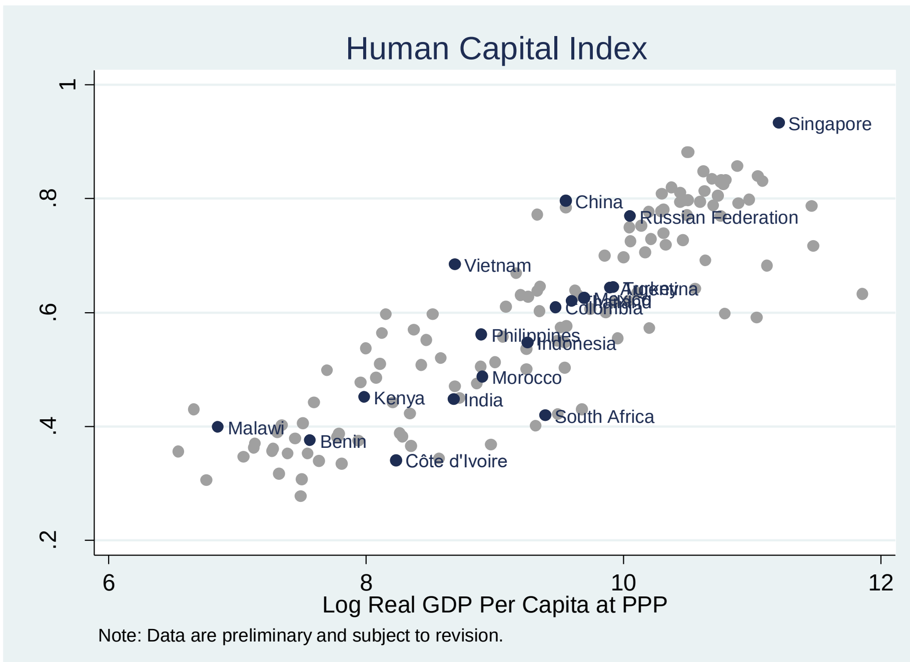
149. The units of the HCI make it straightforward to connect the index to scenarios for future per capita income and growth. Imagine a *status quo* scenario in which the expected years of quality-adjusted school and health as measured in the HCI in a given year persist into the future. Over time, new entrants to the workforce with *status quo* health and education replace current members of the workforce, until eventually the entire workforce of the future has the expected years of quality-adjusted school and level of health captured in the current human capital index. This scenario can then be compared with one in which the entire future workforce benefits from complete education and enjoys full health.

150. In the long run per capita GDP in this scenario is higher than in the *status quo* scenario through two channels: (i) direct effects of higher worker productivity, and (ii) indirect effects reflecting greater investments in physical capital that are induced by having more productive workers. Combining these effects, a country with an HCI score of x will in the long run have per capita GDP in the *status quo* scenario that is only a fraction x of what it could be with complete education and full health. For example, a country with an HCI of $x = 0.5$ would in the long run have per capita incomes twice as high as the status quo if its citizens enjoyed complete education and full health. What this means in terms of average annual growth rates of course depends on how "long" the long run is. If it takes 50 years—or about two generations—for these scenarios to

materialize, then a doubling of future per capita income relative to the status quo corresponds to roughly 1.4 percentage points of additional growth per year.

151. The HCI measures the amount of human capital that the average child born today can expect to achieve (figure 2.3). Naturally, averages hide a great deal of variation. Most of the components of the HCI can be disaggregated by gender for most countries so that differences in the prospects of boys versus girls can be compared. While it is not possible to do systematically for a large set of countries, in individual countries where data is richer, differences in the components of the HCI across regions and socioeconomic groups can also be illustrated.

Figure 2.3. Human Capital Index and GDP per capita



Source: Authors' calculations.

152. The HCI isn't perfect. Components of the HCI such as stunting and test scores are measured only infrequently in some countries, and not at all in others. Data on test scores come from different international testing programs, and the age of test takers and the subjects covered vary across testing programs. Test scores may not accurately reflect the quality of the whole education system in a country to the extent that tests-takers are not representative of the population of all students. Reliable measures of the quality of tertiary education do not yet exist, despite the importance of higher education for human capital in a rapidly changing world. Data on enrollment rates needed to estimate expected school years often have many gaps and are reported with significant lags. Socio-emotional skills are not explicitly captured. Adult survival rates are imprecisely estimated in countries where vital registries are incomplete or non-existent.

153. One objective of the HCI is to call attention to these data shortcomings and to galvanize action to remedy them. Improving data takes time. In the interim, and recognizing these limitations, country positions on the HCI should be interpreted with caution. The HCI provides

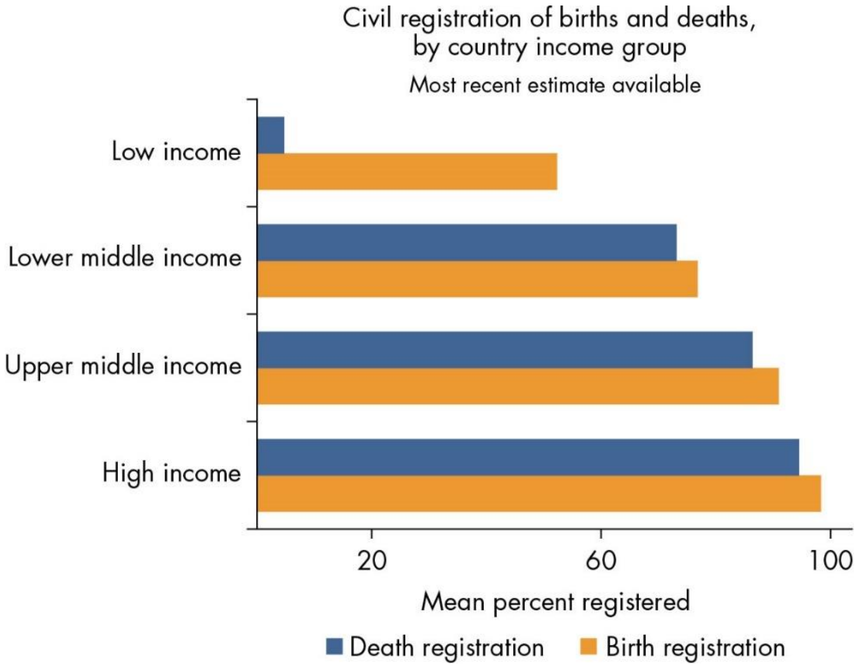
rough estimates of how current education and health shape the productivity of future workers. It is not a finely-graduated measurement of small differences between countries. Since the HCI captures outcomes it is not a checklist of policy actions. The right type and scale of interventions to build human capital are not the same in different countries. Although the HCI combines education and health into a single measure it is too blunt a tool to inform the cost-effectiveness of policy interventions in these areas—which should instead be assessed based on careful cost-benefit analysis of specific programs.

What Comes Next

154. The goal of the HCI is to increase the importance of human capital for politicians, policymakers and citizens. Although there has been significant progress in the availability of data on health and education outcomes there is still a long way to go. Even more work needs to be done in order to measure the intermediating factors that affect these outcomes. While individuals in low- and middle-income countries face similar constraints in the accumulation of human capital, their relevance is often context-specific. Understanding which constraints matter the most is essential to setting priorities across different policy areas.

155. A first step is improving the quality of basic administrative data in education and health. In education, only one in six governments publish annual education monitoring reports. Only about a hundred countries report reasonably-complete and up-to-date data on net enrollment rates at different levels of education to the UNESCO Institute of Statistics—the body that is tasked with compiling this data internationally. Monitoring of even the most basic health information—births and deaths—is inadequate in low- and middle-income countries (figure 2.4). The pace of improvement in these systems has been slow. Worldwide between 2000 and 2012 the percentage of registered deaths changed from only 36 percent to 38 percent. The percentage of children under five whose births were registered only increased from 58 percent to 65 percent.[87] High quality basic administrative data is essential for governments to understand their needs and to plan the allocation of public services.

Figure 2.4. Low- and middle-income countries have inadequate civil registration systems for recording births and deaths



Source: Authors' calculations based on data from Global Health Observatory.
Note: Estimates for birth and death registration coverage based on available data for 180 and 120 countries, respectively. Birth registration based on United Nations demographic yearbook. For countries with incomplete civil registration systems, birth registration is estimated from mothers' self-report of their children's birth registration status, as collected in household surveys. Death registration data based on WHO estimates.

156. Increasing the number of countries where the learning achievements of children are measured—both those in and out of school—would allow much better tracking of countries' performance for school access and learning. This should include making data on learning fully representative of all children, rather than the selection—often from higher income families—who stay in school. The Annual Status of Education Report is a rare example of a survey that provides an annual assessment of the learning levels of children—in this case in India's rural households—for those who are also out of school.[88]

157. Initiatives that aim to create comparable measures of learning across countries should be supported. The objective should be to bring together stakeholders to agree on a set of common questions to include in learning assessments. This would allow results to be harmonized across different tests. In the short term existing data platforms—national household surveys, Demographic and Health Surveys, Living Standards Measurement Study, and SDI—can be used to increase the availability of data on human capital outcomes in a cost-effective way.

158. Similar efforts are underway in health. To harmonize health measurement, the Health Data Collaborative was launched in 2015 by a large group of international agencies, bilateral and multilateral donors, foundations, and governments. Their objective is to improve the coordination of health data collection. New technologies such as the global positioning system and mobile phones are driving down costs and increasingthe scope of data collection.

159. The many dimensions of the correlation between skills and health are still poorly understood. Socio-emotional skills are multi-dimensional. There have been efforts to measure these skills on a large scale among working age individuals through initiatives such as the Skills Towards Employability and Productivity surveys and the Programme for International Assessment of Adult Competencies surveys. There has not been a similar attempt among school age children—even though there is evidence that skills such as grit and self-regulation matter for learning. Interventions that have reduced iron deficiency anemia have been found to improve student learning outcomes[89] but the correlation between health status and student test scores has not yet been quantified.

160. It is important to look at pathways of change as well as outcomes. Understanding how the knowledge and effort of doctors and teachers influence children's health and learning can inform more targeted efforts to invest in human capital. Greater understanding of these factors would help to make sense, for example, of Latin America's discrepancy between relatively high average years of schooling and relatively low student achievement. An emerging body of research shows how effort and competence of health provision are critical factors to poor quality health results.[90] Similarly, unqualified, unmotivated teachers are detrimental to student learning.[91]

161. Vietnam's experience illustrates the potential benefits of mapping and contextualizing pathways of change. Vietnam's schoolchildren scored in the top quarter of the mostly high- and middle-income countries that participate in 2012 and 2015 PISA. This performance is remarkable, given Vietnam's level of per capita income. A careful study of the PISA results found that observable student- and school-level characteristics could not account for the high test-score performance, suggesting that other more intangible factors were at play in delivering these results.[92] Understanding these factors and their applicability in other contexts could provide important lessons for how to ensure that schooling achieves learning.

162. More research is needed to shed light on how different factors interact in shaping human capital outcomes. When looking at how to improve learning outcomes, demand-side interventions—motivating children to attend school and learn—and supply-side—teacher performance—both matter. How and to what extent they interact is not yet well understood , but it is crucial for policy design. This is also the case for health interventions.

163. Researchers are usually able to keep small-scale pilot programs under control at the implementation stage. They tending to select their study groups from homogeneous environments, which helps compliance. But that is not possible for policymakers implementing at a large scale. In some cases early childhood development policies, implemented in developed and developing countries, achieved short-term resultsin small-scale randomized trials but did not deliver when they were scaled up.[93] Researchers and policymakers have a lot of work to do in order to understand what are the key ingredients for turning pilot programs into success stories on a grand scale.

Chapter 3: Lifelong Learning

164. Nelson Mandela, the first president of post-apartheid South Africa, said this: “Education is the great engine of personal development. It is through education that the daughter of a peasant can become a doctor, that the son of a mineworker can become the head of the mine, that the child of a farmworker can become the president of a great nation. It is what we make out of what we have, not what we are given, that separates one person from another.”

165. Automation is reshaping work and the skills needed for work. Demand for advanced cognitive skills[94] and socio-emotional skills[95] are increasing. Demand for narrow job-specific skills is waning.[96] here is increasing demand for skills associated with ‘adaptability’. These are a combination of specific cognitive skills (critical thinking and problem solving) and socio-emotional skills (creativity and curiosity) that are transferable across jobs.

166. How well countries cope with the demand for changing skills depends on how quickly and pertinently the supply of skills shifts. Education systems tend to be resistant to change. A significant part of the supply re-adjustment is happening outside compulsory education or formal jobs. Early childhood, tertiary education and adult learning outside jobs are increasingly important in meeting the skill demands of future labor markets. This chapter shows how.

167. Automation—and technology adoption more generally—makes some jobs obsolete. Demand for skills linked to home-appliance repair is decreasing quickly because technology drives down equipment prices and improves reliability. Innovation creates new types of jobs. A large share of children entering primary school in 2018 will work in occupations that do not yet exist. Even in low- and middle-income countries many people are employed in jobs that did not exist three decades ago. India has nearly four million app developers; Uganda has over 400,000 internationally certified organic farmers; China has 100,000 data labelers.

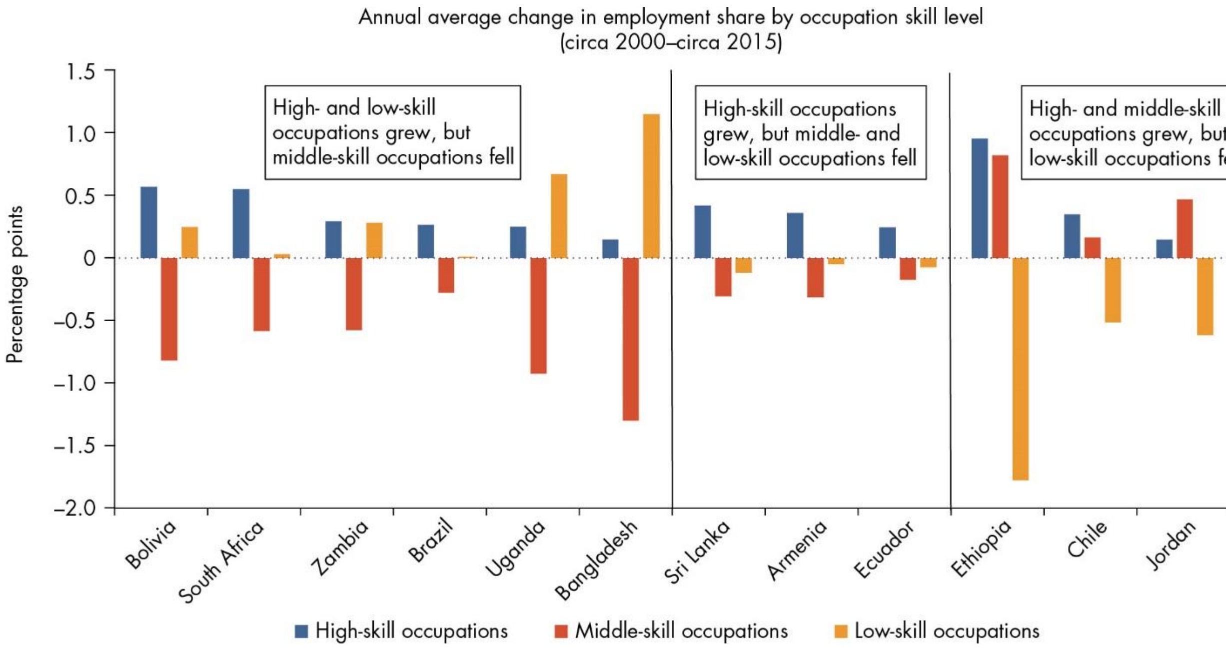
168. But many current jobs are being retooled into new forms, resulting in new and sometimes unexpected skills combinations. In 2018 a marketing professional might well be called upon to write algorithms. A physics graduate may land a job as a quantitative trader in the finance industry. Workers who can bring emerging skills into relevant technical fields of expertise— teachers who are good at web design, actuaries proficient in big data analytics—are likely to be in high demand.

169. Which skills are now less in demand? Evidence from developed countries points to job polarization—the expansion of high- and low-skill jobs coupled with the decline of middle-skill jobs.[97] Demand for non-routine cognitive tasks, such as high-skilled research, is increasing. So is the relative demand for non-routine tasks which cannot be automated easily, such as food preparation. Conversely demand for procedural routine tasks, which are often performed in middle-skill jobs such as data entry, is decreasing due to automation or offshoring. This trend of vanishing middle-skill jobs has fueled concerns about rising inequality.

170. Is the same pattern starting to emerge in low- and middle-income countries? Not quite. In many developing countries, demand for high-skilled workers is increasing (figure 3.1). The share of workers in high-skill occupations increased by eight percent or more in Ethiopia, Bolivia and South Africa from 2000 to 2014. But the change in demand for middle- and low-skill jobs is more

heterogenous across countries. In Jordan the share of employment in middle-skill jobs increased by 7.5 percent between 2000 and 2016. In Bangladesh this share decreased by almost 20 percent during the same period.

Figure 3.1. In many developing countries, share of employment in high-skill occupations has increased



Source: Authors' calculations based on International Income Distribution Database.
Note: High-skill occupation: (1) managers, (2) professionals, (3) technicians and associate professionals. Middle-skill occupation: (1) clerical support workers, (2) service and sales workers, (3) craft and related trades workers, (4) skilled agricultural, forestry and fishery workers, (5) plant and machine operators, and assemblers. Low-skill occupation: elementary occupations.

171. This change in demand for low- and middle-skill jobs in developing countries is not surprising. What happens at this end of the skills spectrum is likely to be driven by the competing forces of automation and globalization. The rate of technology adoption tends to vary considerably across developing countries. Iin Europe and Central Asia 26 percent of the population had fixed broadband subscriptions in 2016 compared with just two percent in South Asia. Globalization is bringing the medium and low skill jobs of developed countries to some—but not all—developing countries. Depending on the relative speed of these forces, some developing countries are seeing an increase in middle-skilled jobs; others are seeing a decline.

172. Governments are struggling with the trade-off between skill adjustments of the current workforce versus skill adjustments among those who enter the labor market in the next decade. Plans for creating a skilled workforce for the future of work should rest on increased demand for advanced cognitive skills, socio-emotional skills and for the 'skill' of adaptability, which is a combination of specific cognitive and socio-emotional skills.

173. Advanced cognitive skills—especially those that are transferrable across jobs—appear to be increasingly important. These determine how well individuals understand the complex world around them and act based on this understanding. Evidence across low- to high-income countries

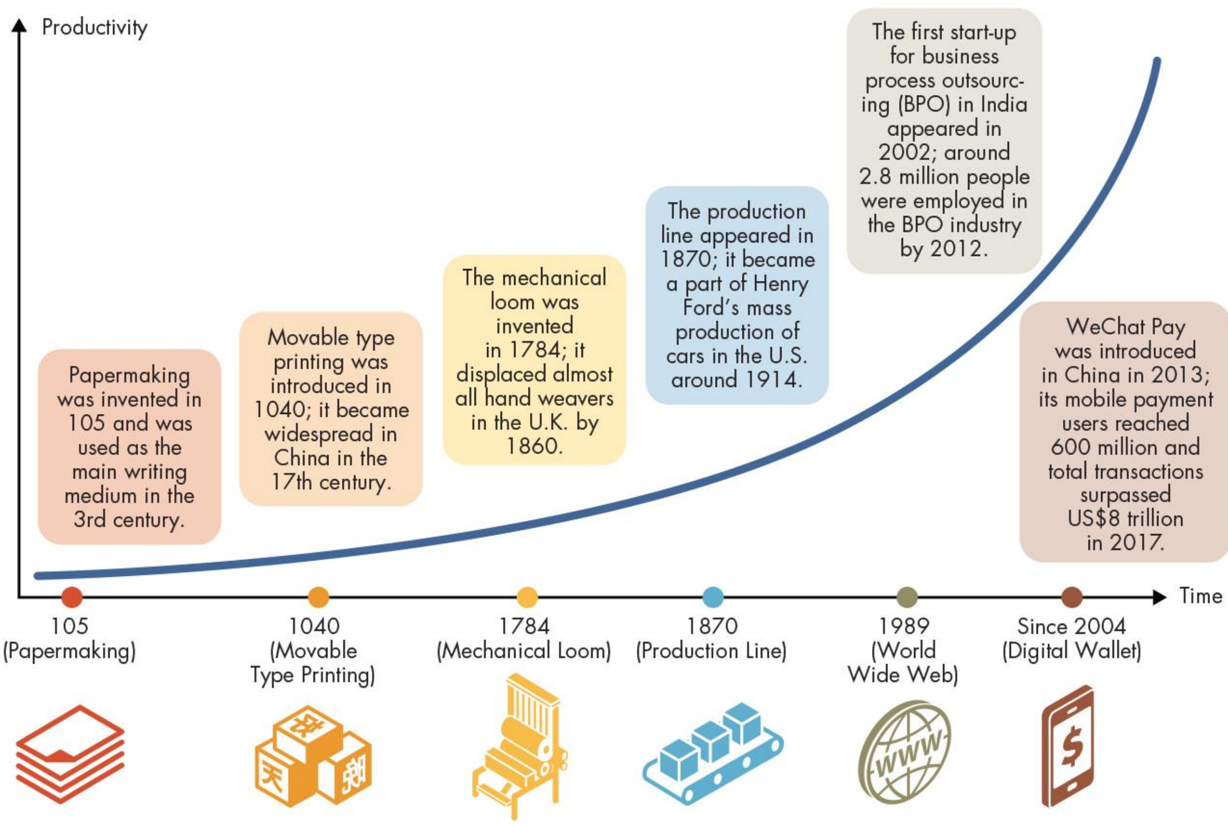
suggests that jobs are becoming more intensive in cognitive, analytical tasks in recent decades. In Bolivia and Kenya more than 40 percent of workers using computers perform complex tasks that require advanced programming.[98] Demand is rising for transferable higher-order cognitive skills like logic, critical thinking, complex problem solving and reasoning. Irrespective of the region of the world, these skills are consistently ranked among the skills most valued by employers.[99] Analysis covering Denmark, France, Germany, Slovakia, South Africa, Spain, and Switzerland shows that a one standard deviation increase in complex problem-solving skills is associated with 10- to 20-percent higher wage.[100] In Armenia and Georgia, the ability to solve problems and learn new skills yields a wage premium of nearly 20 percent.[101]

174. Socio-emotional skills include the ability to recognize and manage emotions, develop caring for others and establish positive relationships. They often cover human capabilities that machines are unable (for now) to replicate. Creativity, innovation and social interaction are likely to remain high in demand. A finer-grained list could include curiosity, emotional intelligence, empathy, leadership, teamwork, conflict resolution and relationship management. Even when medical diagnostics have been taken over by computers, doctors will still play a vital role offering empathy, managing information, and negotiating difficult situations humanely.

175. In Sweden, returns to social skills have almost doubled from 1992 to 2013 in the private sector[102] and will continue growing. Demand for socio-emotional skills is also increasing in developing countries. In Latin America and the Caribbean the adoption of digital technology has placed more importance on general cognitive skills and increased demand for workers with interpersonal skills.[103] In Cambodia, El Salvador, Honduras, Lao PDR, Malaysia, the Philippines, and Vietnam more than half of firms report shortages of workers with specific socio-emotional skills, such as commitment to work.[104]

176. Rapid technological change makes it harder to anticipate which job-specific skills will thrive and which will become obsolete in the near-future. Shifts in skill requirements prompted by technological progress took centuries to manifest in the past (figure 3.2). Today, the advances in technology demand new skills seemingly overnight.

Figure 3.2. Time needed for technological diffusion keeps getting shorter



Source: Authors' calculations.

177. It therefore makes sense to invest in skills that enhance individuals' adaptability and can easily be transferred from one type of job to another. The ability to quickly adapt to changes are increasingly valued by the labor market.[105] The sought-after trait is adaptability—the ability to respond to unexpected circumstances, and to un-learn and re-learn quickly. This requires a combination of certain cognitive (critical thinking, problem solving) and socio-emotional skills (curiosity, creativity). A study of technical and vocational students in Nigeria showed that the socio-emotional skill of 'self-efficacy' was positively and significantly predictive of career adaptability.[106]

178. Strong skill-foundations are important for developing these three in-demand skills—advanced cognitive, socio-emotional, and skills predictive of adaptability. For most children across the world, these skill-foundations are formed through primary and secondary education. Yet the World Development Report 2018 shows that the foundational skill acquisition that one would expect to happen in schools is not occurring in many low- and middle-income countries.

179. Important skills re-adjustments are happening increasingly outside compulsory education (and formal jobs). This chapter discusses three types of skills investments that can have big pay-offs in the changing nature of work: early childhood investments, tertiary education, and adult learning outside jobs. Skills development for the changing nature of work is a matter of lifelong

learning. In a rapidly changing world people need several opportunities to re-skill or up-skill throughout their lifetimes. Lifelong learning is especially germane to skills-readjustment amid rapid demographic change—be it the rapidly aging populations of East Asia and Eastern Europe or the large youth bulges in Sub-Saharan Africa and South Asia.

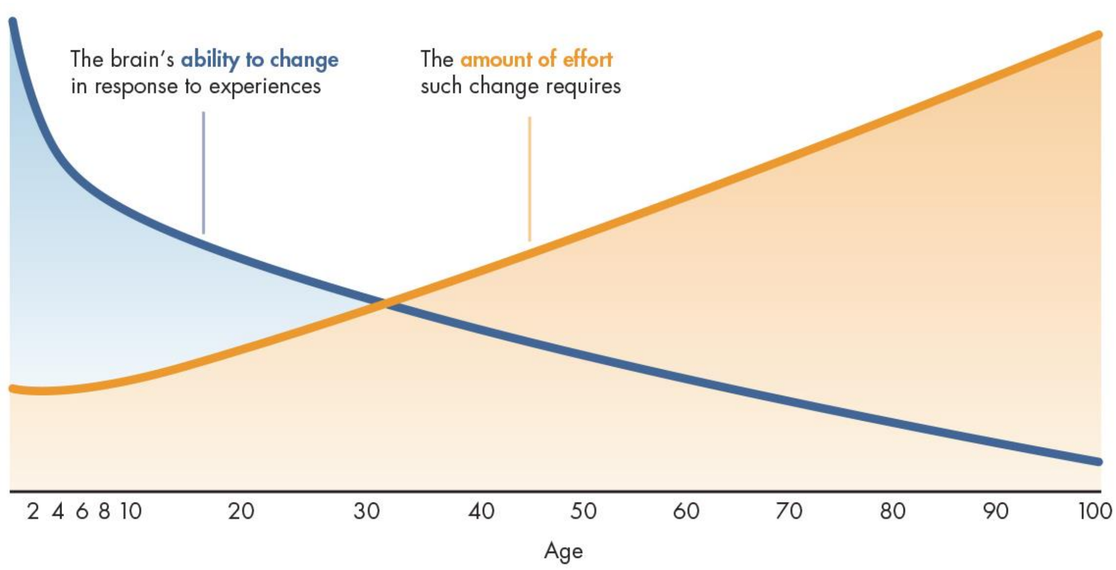
Learning in Early Childhood

180. In France the mandatory school starting age is soon to be reduced from six to three years. According to President Emmanuel Macron this reform is intended to boost equality, improving the ability of children from disadvantaged backgrounds to remain competitive in the education system.

181. The most effective way to acquire the skills demanded by the changing nature of work is to start early. Early investments in nutrition, health, protection, and education lay strong foundations for future acquisition of cognitive and socio-emotional skills. They also make future skill acquisition more resilient to uncertainty. Early childhood investments are an important channel to improve equality of opportunity. Currently, these investments are underprovided, especially for poor, disadvantaged children who can benefit the most from them. Prioritizing these investments can have big pay-offs for economies, as long as both access and quality are highlighted.

182. The foundations of brain architecture are set from the prenatal period to the age of five—making this an important stage to develop cognitive and socio-emotional skills. During this period the brain's ability to learn from experience—its "plasticity"—is at its highest. Brain plasticity decreases with age (figure 3.3). This means that early childhood investments can influence the ability to acquire skills. As a result, experiences and learning during this period directly affect achievement in adulthood. If this window is missed, skill-building becomes harder.

Figure 3.3. Brain's ability to learn from experience decreases with age



Source: Authors' calculations based on Center on the Developing Child at Harvard University 2016.

183. Quality early childhood development programs enable children to "learn to learn." Investments in nutrition, health, and stimulation in the first thousand days of life build stronger brains. The engagement of parents and caregivers during this phase also matters for the development of children's language skills, motor and self-regulation skills, as well as social behavior. In Colombia exposure to psychological stimulations through home visits with play demonstrations significantly improved cognitive development of children aged 12-24 months.[107] In Pakistan, the *Lady Health* Workers program, which provided health services in rural areas, led to a decline in infant mortality from 250 to 79 for every 100,000 live births.[108] The program generated sustained positive effects on children's cognitive abilities and pro-social behaviors when it provided nutrition supplementation and encouraged mothers to engage in responsive play with children aged up to the age of two.[109]

184. From the age of three socialization and more formal early learning become important to prepare children to succeed in primary school. Quality pre-school strengthens children's executive functions (e.g., working memory, flexible thinking, self-control), launching them on higher learning trajectories. In Bangladesh rural children who attended pre-school performed better in early grade speaking, writing and mathematics compared with those who did not.[110] A pre-school reform in rural Mozambique had positive effects on socio-emotional development—participating children were better at interacting with others, following directions and regulating their emotions under stress.[111] But, to achieve these results, the quality of pre-schools needs to meet thresholds. Low quality pre-school can be worse for child development than no pre-school at all.[112]

185. Early childhood investments efficiently produce skills that are relevant to a child's future. Learning is cumulative—skills acquired at an earlier stage facilitate skill formation in subsequent stages. The returns for early investments are the highest and the advantages conferred by these investments grow overtime. An additional dollar invested in quality early childhood programs yields a return of six to 17 dollars.[113]

186. Early childhood development programs improve parents' labor force participation . Many women do not work due to time-consuming childrearing responsibilities. In the United Kingdom, half of the stay-at-home mothers would prefer going back to work if they could get high-quality, affordable childcare services.[114] Early childhood development investments can alleviate this constraint. In Argentina a large-scale construction program of pre-primary school facilities in the 1990s positively affected maternal employment.[115] In Spain during the same period maternal employment increased by 9.6 percent as a result of the availability of full-time public care for three-year-old children.[116]

187. Early childhood investments are also effective in increasing equity. For children exposed to poverty and other adverse conditions quality early childhood programs increase adult competence, reduce violent behavior and social inhibition, as well as foster growth in the subsequent generation. In Guatemala an early childhood development nutrition program for poor families significantly increased wages for these children in adulthood.[117] In Jamaica early stimulation for infants and toddlers increased their future earnings by 25 percent—equivalent to adults who grew up in wealthier households.[118]

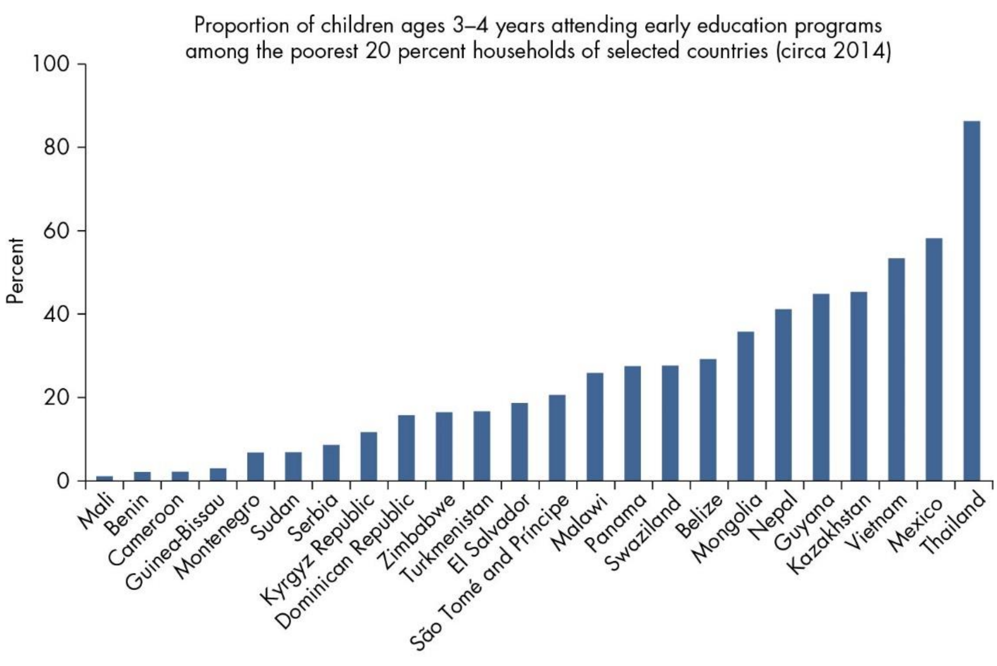
188. Early childhood investments are underprovided despite their efficiency in producing important skills. Around 250 million children under the age of five are at risk of not reaching their

developmental potential in low and middle-income countries because of stunting or extreme poverty. Worldwide more than 87 million children under the age of seven have spent their entire lives in conflict-affected areas. They suffer from extreme trauma and toxic stress, which impair their brain development and skill enhancement. Only half of all three- to six-year-olds have access to pre-primary education globally—in low income countries this share is one in five.[119] In 2012, North America and Western Europe countries spent 8.8 percent of their education budgets on pre-primary education; in Sub-Saharan Africa the share allocated was a paltry 0.3 percent.[120]

189. Children from poor families are the least likely to attend early childhood development programs (figure 3.4). They are also the ones who can benefit the most from such programs. In low- and middle-income countries, approximately 47 percent of wealthiest families have access to early education programs, but for the poorest families this number is 20 percent.[121] Rural families are especially disadvantaged. Across a sample of 15 countries rural dwellers consistently have worse access to early childhood development programs compared to those living in urban areas.[122]

190. Quality is often a concern even for those who have access to care services or early learning. Poor quality early childhood development programs can lead to disappointing results in children's language development, cognitive skills and sociability. A study of preschools in a Nairobi slum, Kenya, shows that, despite high participation rates, the curriculum and pedagogical approach were not age-appropriate. In the program, three to six-year-olds had to follow academic-oriented instruction and even sit for exams.[123] In Peru, while the national *Wawa Wasi* program has provided safe community-based daycare and nutritious diet for children aged six to 48 months in impoverished areas, it failed to improve children's language or motor development skills due to insufficiently trained care-givers.[124]

Figure 3.4. In many countries, children from disadvantaged background are least likely to attend early childhood education programs



Source: Authors' calculations based on data obtained from UNICEF Multiple Indicator Cluster Survey.

191. Effective solutions for early childhood development are available. In some places community-based playgroups have generated sustained outcomes at a low cost. In Indonesia aprogram positively affected children's language, socioemotional and cognitive skills; children from disadvantaged backgrounds benefited more in both the short and long term.[125] In Tonga organizing playgroups for children up to the age of five significantly improved their early grade reading skills.[126] The Montessori model, characterized by multi-age classrooms, student-chosen learning activities and minimal instruction has been shown to be more effective than conventional education in improving children's executive functions.[127] With successful local adaptations, Montessori and other child-centered approaches—including Steiner, Reggio Emilia, and Tools of the Mind—can be found in diverse settings from Kenya to Haiti.[128]

192. Research has uncovered several concrete ways to increase take-up of early childhood development investments.Cash transfers can support early childhood development for the poorest children. Programs have reduced stunting in the Philippines and Senegal, fostered language development in Ecuador and Mexico and improved children's socioemotional skills in Niger.[129] Integrated approaches that combine health, nutrition and stimulation investments can be highly effective as well. Chile's *Crece Contigo* program integrates the services provided by the health, education, welfare and protection services so that a child's first contact with the system occurs while still in the womb during her mother's first prenatal control.[130]

193. However global evidence needs to be adapted to local conditions. A highly successful child nutrition program from Southern India failed to have any impacts in Bangladesh, partly because the program targeted mothers. Decisions about the feeding of young children in Bangladesh were often being made by mothers-in-law, not mothers. Local context matters for effective early childhood development.[131]

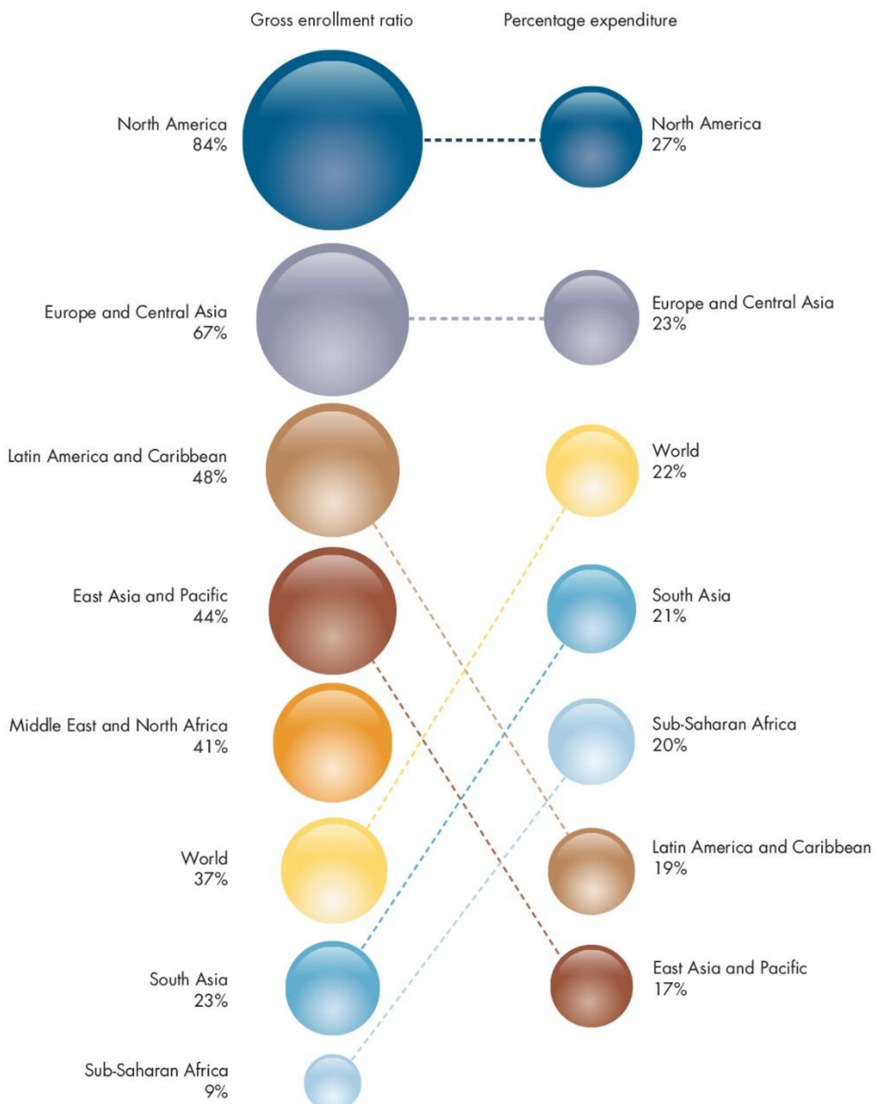
194. Ultimately, measurement is necessary to understand where investments are needed, find effective solutions and adapt them locally. The World Bank-supported *Measuring Early Learning Quality and Outcomes* (MELQO) consortium is an effort in this direction. It is developing measurement modules that can be implemented at scale. Such information improves the quality of early childhood development by helping target those most in need and establish quality assurance systems. So far, eleven low- and middle-income countries have participated in the MELQO pilot. In Mongolia the government used MELQO to assess early childhood development outcomes by socioeconomic status. The findings were used to inform policies that address quality of pre-primary education and cross-region differences. The Nicaraguan government incorporated MELQO results into the design and planning of the country's preschool measurement system.

Tertiary Education

195. The Free University of Tbilisi was established in 2007 through a non-profit organization. It has already become the top-performing, most sought-after university in Georgia. This was accomplished through transparent admissions (nationally competitive entry examinations), high-quality faculty, flexible course offerings, as well as discussion-based pedagogy. Each year, the university attracts hundreds of top-tiered applicants, while more than 90 percent of its graduates find employment or enroll in further education.

196. More integrated, technology-driven economies appear to reward tertiary education. The global average private return to tertiary education is 15.8 percent.[132] But these returns are not high for everyone. They depend on a range of factors including the quality of the provider, student composition, the availability of jobs. Controlling for other factors, students attending a top university in Colombia earn 20 percent more than those who just failed to meet the cut-off.[133] Returns also vary dramatically based on the field of specialization. In Chile, for example, the return to tertiary education ranges from 4.1 percent for humanities to 125.8 percent for engineering and technology.[134] Tertiary enrollment and expenditure also vary considerably by region (figure 3.5).

Figure 3.5. Gross tertiary enrollment ratio and percentage expenditure on tertiary education by region, 2016



Source: World Development Indicators.

Note: Gross Tertiary Enrollment Ratio: The ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to tertiary education. Percentage Expenditure on Tertiary Education: Expenditure on tertiary education expressed as a percentage of total general government expenditure on education. Expenditure on tertiary education data is as of 2013, and is unavailable for Middle East and North Africa.

197. The changing nature of work makes tertiary education more attractive in three ways. First, technology and integration have increased the demand for higher-order general cognitive skills—like complex problem solving, critical thinking, or advanced communication that are transferable across jobs but cannot be acquired through schooling alone. Rising demand for these skills has enhanced the wage premiums of tertiary graduates,[135] while reducing the demand for less educated workers.[136] Second, by increasing the demand for lifelong learning. Workers are expected to have multiple careers; not just multiple jobs over their life-time. Tertiary education—with a wide-array of course offerings and flexible delivery models like online learning and open universities—meets this growing demand. Third, tertiary education, especially universities, become more attractive in the changing world of work by serving as platforms for innovation.

198. The relevance of tertiary education systems for the future of work depends on how well they deliver on these three fronts. Increasingly, skills acquisition is a continuum, not a finite decision-tree. To better serve this model, tertiary systems would need to become more flexible, more effective at producing transferrable higher-order skills, and more actively facilitate innovation.

199. Flexibility is increased by ensuring that when students open the door to one pathway, the door to other pathways does not close irrevocably. For instance, at the start of tertiary education most students must choose between general education or vocational training. General education such as programs on engineering or economics prepare students in transferable higher-order skills that determine their overall learning-readiness or trainability. On the other hand, vocational training, such as programs on nursing or airport operations, is directly related to specific occupations. Once this choice is made—especially if it is for vocational training—it can be difficult and expensive to reverse. This rigidity in tertiary systems is inefficient and inequitable given the future of work.

200. The trade-offs between general and vocational education are changing in unpredictable ways, and most economies continue to need both. Technological progress tends to lower the demand for certain occupation-specific skills, making certain vocational degrees obsolete. It also leads to a higher depreciation of narrow job-specific skills compared to general skills. At the same time, vocational training continues to be pursued by many. In 2012, 63 percent of Dutch higher education students were attending vocational training.[137] This share was more than 50 percent in Malaysia, and 31 percent in Kenya in 2013.[138] Vocational training meets immediate demand for technical skills, enables faster education-to-work transitions for some, and alleviates pressures on the university system.

201. Against this backdrop, three factors make flexibility between general and technical tracks imperative for the changing nature of work. First, the combination of general and technical skills is becoming highly valued. Second, even technical jobs seem to be getting more intensive in higher-order general skills, implying that this type of skills acquisition needs to be accessible before and during work-life. Third, those trained in narrow vocational skills need viable options for an unpredictable future. A straightforward way to do this is by introducing “bridging” arrangements allowing vocational students to continue their studies at universities. For instance, Congo, Dem. Rep. offers “bridging” arrangements for vocational graduates to continue to university.

202. Close collaboration between industry and vocational education also plays a role. For example, in China, Lenovo is working with tertiary institutes to train vocational students in high-tech areas such as cloud computing, which features practice-based curricula, practitioner-led instruction, along with professional certification. In addition, filling in information gaps enables students to make choices between and within different paths. Chile, for instance, is establishing online platforms where students can access information on the employability of individuals with various degrees, wage profiles, courses to take for certain occupations, among other things.[139]

203. Greater flexibility is also needed within course formats. The demand for lifelong learning implies that the working population needs to top-up existing skills with just-in-time qualifications. This demand calls for flexible delivery models that allow individuals to access tertiary education while working. Also, for sharper, self-directed, and practical training, a greater mix of degrees and shorter courses are needed. It is possible to imagine future tertiary education systems that provide "stackable credentials" in which qualifications can be fitted together in flexible and customizable ways.

204. Tertiary systems have not remained static or impervious to these changing demands. They have responded. General and vocational tracks often intersect. There is a wide range of programs offered by universities which have a vocational dimension or orientation—including many in science, engineering and technology. In addition, technology-enabled platforms are making tertiary education more agile, especially to those with historically low access. The five largest distance-learning programs are based in lower or middle-income countries. India is the second largest consumer of Massive Open Online Courses (MOOCs).[140] XuetangX, the major MOOCs and blended learning portal from China, crossed 10 million students in 2018. Veduca from Brazil launched the world's first open online MBA program in 2013, and now offers over 5,000 courses. MOOCs represent a promising way of delivering flexible, personalized education to a large population. But ensuring quality is a serious challenge. A recent study shows that students who took a course online performed worse than those who followed in-person instructions.[141] Besides content, many MOOCs fail on dimensions of student engagement or instructor quality.

205. Tertiary education systems need to guarantee a minimum threshold of transferable cognitive skills—which are the best inoculation against job uncertainty. But many tertiary education systems are not effective at producing these skills. For example, in Colombia, there is significant variation across universities in their ability to impart foundational higher order skills such as critical thinking, problem-solving and communications.[142] A study among Chinese undergraduates in engineering and computer science suggests that their cognitive skills did not improve much during the first two years of college.[143]

206. Incorporating more general education in tertiary programs is one way to increase acquisition of transferable higher-order cognitive skills. In 2012, an additional year of general education was added to undergraduate programs in Hong Kong SAR, China—focusing on problem solving, critical thinking, communication, leadership, and lifelong learning skills. A large majority of students perceive this change as being effective in promoting desirable graduate attributes. Another way is through innovative pedagogy. The faculty of Architecture and Environmental Design at College of Science and Technology-University of Rwanda promoted learning strategies that include open-ended assessment, feedback opportunities, and a progressive curriculum that balances academic challenge with student support. These approaches improved the critical

thinking skills of students.[144] Another channel is through better metrics that reliably assess student gains in complex cognitive skills at the higher education level.

207. Tertiary education may also build transferable socio-emotional skills, such as teamwork, resilience, self-confidence, negotiation and self-expression. In a survey of employers of engineers in India, socio-emotional skills were ranked at or above technical qualifications and credentials in terms of their significance for the employability of recent graduates.[145] Employer surveys in Bulgaria, Georgia, Kazakhstan, Poland, Macedonia FYR, the Russian Federation, and Ukraine indicate that employers see the lack of socioemotional skills at least as binding as technical skills.[146]

208. Socio-emotional skills can be acquired in adulthood. Forward-looking universities are finding ways to do this. Dutch Vocational Colleges provide entrepreneurial courses with the objective of improving non-cognitive skills such as teamwork and self-confidence.[147] In Tunisia, introducing an entrepreneurship track that combines business training with personal coaching reshaped behavioral skills of university students.[148] In Spain, cooperative learning strategies (learning in small teams with peers of different ability levels) improved empathy, assertiveness, cohesion, as well as the ability to accept different views and reach agreements among university students.[149] In China, a combination of cooperative learning and role play enhanced self-educational abilities and communication skills among undergraduate students in pharmacology classes.[150] However, to better teach socio-emotional skills, more efforts are necessary to design appropriate curricula and accurate measurement, especially in the contexts of low income countries or rural areas.

209. Tertiary education systems often serve as centers of innovation—this role will be increasingly valued in future economies. In industries such as pharmaceuticals or electronics, more than 10 percent of the new products and processes have been commercialized thanks to academic research.[151] One study suggests that universities and research institutes, rather than firms, have driven scientific advances in sectors like biotechnology.[152] In Sub-Saharan Africa, nearly 45 percent of the university research output focused on health sciences, grappling with the most pressing issues of the region.[153] Further, knowledge spillovers from university activities remain strong. In Sweden, the presence of university research contributes to 0.5 percent more patents awarded in labor markets each year.[154] In Chile and Colombia, firms are more likely to introduce new products and patent them if they collaborate with universities.[155]

210. There are well-known examples of successful university innovation clusters in the developed world—innovation clusters around Stanford University (Silicon Valley) and Harvard-MIT (Boston's Route 128) in the United States, Cambridge-Oxford ("Golden Triangle") in the United Kingdom, to name a few. Such clusters are also emerging in middle income countries. In Malaysia, the University of Malaya has established eight interdisciplinary research clusters during the past decade, covering sustainability science and biotechnology.[156] In China, Peking University is building *Clinical Medicine Plus X*, a research cluster for precision medicine, health big data, and intelligence medicine.[157] As part of the *Startup India* initiative, seven new research parks located in different IIT campuses are established to promote innovation through incubation and collaboration between universities and private sector firms.[158] In Mexico, the Research and Technology Innovation Park currently houses more than 30 research centers covering R&D in biotechnology, nanotechnology, robotics; seven of them are led by universities.[159]

211. Two main factors matter for a healthy innovation ecosystem. First, prioritize the right university for the right sector. The agglomeration effects of universities vary by sector. For example, university R&D has been shown to be irrelevant for sectors such as furniture.[160] Second, a healthy innovation ecosystem requires an enabling environment. Just because successful innovation clusters exist does not mean that governments can create them. However, governments can "set the table"—for example, by providing necessary local infrastructure, increasing expenditure on R&D, assisting universities to attract high-quality researchers and connect with private sector innovation, easing rigid labor market regulations.[161]

Adult Learning Outside Jobs

212. As the nature of work changes, some workers are caught in the cross-hairs of ongoing skills disruptions. As economies adjust skills provision for the human capital of the next generation, the current working-age population becomes anxious over job prospects.

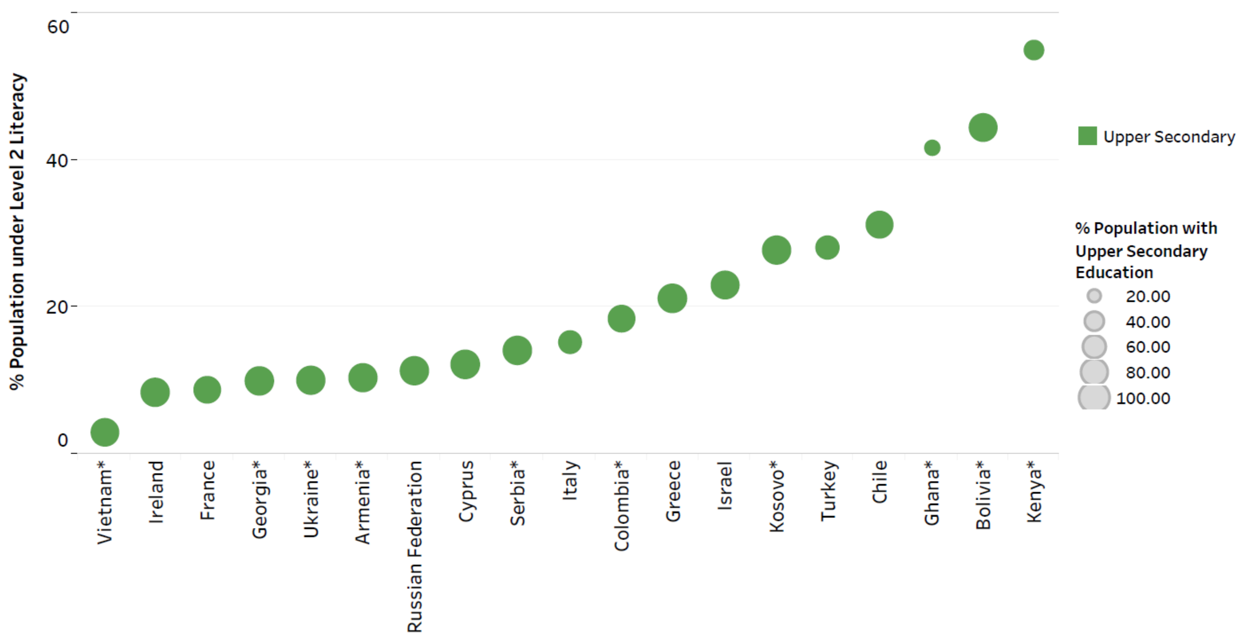
213. One step towards lessening this anxiety is adult learning for reskilling and upskilling those who are not in school or in jobs. This approach has shown more promise in theory than in practice. Bad design too often gets in the way. There are three ways to improve adult learning—more systematic diagnoses of the specific constraints that adults are facing, pedagogies that are customized to the adult brain, and flexible delivery models that fit well with adult lifestyles. Adult learning is an important channel for skills readjustments in the future of work, but it needs a serious design re-think.

214. Adult learning programs come in many different forms. This section mainly focuses on three types that are particularly relevant in preparing adults for the changing labor markets: programs on adult literacy, skills training for wage employment, and entrepreneurship programs.

215. Worldwide more than 2.1 billion working-age adults (aged 15-64) have low reading proficiency.[162] In Sub-Saharan Africa, nearly 61 percent of workers are not fully reading proficient; in Latin America and Caribbean this proportion is 44 percent. In India only 24 percent of 18- to 37-year-olds who dropped out of school before completing primary could read.[163] Low quality education may lead to poor literacy skills even among those with education attainment (figure 3.6). In Ghana, Bolivia and Kenya, more than 40 percent of 19- to 20-year-olds with upper secondary education score below basic literacy level, compared to only 3 percent in Vietnam. This is a problem. Given the future of work, functional literacy is a survival skill. The economic and social cost of adult illiteracy to developing countries is estimated at more than US$5 billion a year.[164]

216. Even with basic literacy skills, many people leave school too early to thrive in work or life. This could be because of economic or cultural constraints or low quality of basic education or both. In 2014, the drop-out rate from lower secondary general education is on average 27.5 percent in low income countries, while such share is 13.3 percent and 4.8 percent in middle and high income countries, respectively.[165] Lacking formal certification and trainings in other necessary skills, it is difficult for early school leavers to find jobs or pursue further education later in life. Similar constraints are also faced by many adults who stayed in school but were failed by poor quality of basic education.

Figure 3.6. In some countries, large share of 19- to 20-year-olds have low literacy skills despite completion of secondary education



Source: Authors' calculations based on Levin et al. forthcoming.
Note: For countries marked with asterisks the calculation is based on STEP Skills Measurement Surveys; otherwise the calculations are based on Program for the International Assessment of Adult Competencies (PIAAC) dataset. Tertiary education is merged with upper secondary education. STEP surveys are representative of urban areas. The PIAAC sample for the Russian Federation does not include the population of the Moscow municipal area.

217. Concerns about unemployment and underemployment also continue to be pressing. Globally, around 260 million youth aged 15 to 24 are out of school and out of work.[166] A pool of unemployed adults is not only an economic concern, but also a political risk. It can lead to large emigration, social unrest, or political upheaval. Insufficient economic opportunities for an increasingly educated population was seen to be a major catalyst for the Arab Spring. Changing demographics add additional pressures to the labor market. With population aging, many rich countries are trying to equip a smaller, older workforce with skills to sustain economic growth. Other countries with big youth cohorts struggle with a low-skilled labor force trapped in low-productivity jobs.

218. Adult learning programs upskill, retool and improve the adaptability of older workers. India's *Saakshar Bharat* initiative from 2009 aimed to provide adult literacy to 70 million adults. In Ghana, adult literacy programs yielded labor market returns of more than 66 percent.[167] To give out-of-school individuals a second chance, the Mexican National Institute for Adult Education has developed flexible modules to deliver education programs that are equivalent to primary or secondary education. Under the World Bank's Nepal *Adolescent Girls Initiative*, vocational training for women increased their non-farm employment by 174 percent.[168] The Argentinean *Entra21* program provided adult skills training and internships, leading to 40 percent higher earnings among participants.[169] Kenya's *Ninaweza* program offered skills training to young women living in informal settlements in Nairobi—leading to a 14 percent increase in the likelihood of obtaining a job, increased earnings, and improved self-confidence for participants.[170]

219. But many adult learning programs fall short of impact. Adult literacy programs often improve word recognition but fail to improve actual reading comprehension.[171] In Niger, although an adult education program increased the number of words that participants can read, it did not improve their reading speed to one word every 1.5 second—the speed needed for comprehension.[172] Entrepreneurship programs often improve business knowledge but not employment. In Peru, training improved business practices among the targeted female entrepreneurs, but did not generate significant impacts on employment.[173] Vocational training for the unemployed often improves short-run earnings but not always increases long-run employment. The Dominican Republic's *Juventud y Empleo* program improved non-cognitive skills and job formality, but did not increase employment.[174] Turkey's vocational training had no significant impacts on overall employment, while the positive effects on employment quality faded in the long term.[175]

220. Even among the successful adult learning programs, costs are high. In Liberia, even though young women with access to job skills training enjoy higher monthly earnings—US$11 more than the comparison group—the program cost is US$1650 per person.[176] It would take 12 years of stable effects for the training program to recoup its costs. For some programs in Latin America it takes a long time to attain positive net present values if the program benefits sustain: 7 years for *ProJoven* of Peru and 12 years for *Proyecto Joven* of Argentina.[177] Adult learning is frequently one part of a comprehensive package, which makes it difficult to understand the cost-effectiveness of that—frequently more expensive—component. The Chilean Micro Entrepreneurship Support Program, boosted self-employment by 15 percentage points in the short run.[178] However, it is not clear how much of this can be attributed to the 60-hour business training, as opposed to the US$600 capital injection.

221. There are two main reasons for low effectiveness: suboptimal design and incorrect diagnoses. Adult brains learn differently—this is not always factored into program design. The brain's ability to learn decreases with age. Therefore, adult learning programs face a built-in challenge—acquiring knowledge when the brain is less efficient at learning. Advances in neuroscience suggest how to tackle this. An adult brain's ability to learn is significantly dependent upon how much it is used. Practice is essential to adult learning. Consequently, adult learning programs have a greater chance of success if lessons can be integrated into everyday life. For instance, in Niger, those who were taught basic operations on their mobile phones as part of an adult education program had reading and math scores that were significantly higher than those who were not.[179]

222. Adults face significant stress which compromises their mental capacity—this is not always factored into program design, either. For adults, emotions are constantly mediated by the demands of family, child care, and work. These demands compete for cognitive capacity required for learning. Sugar farmers in India, for example, were found to have markedly diminished cognitive capacity when poorer (during pre-harvest) than when richer (during post-harvest).[180] Creating emotional cues linked to learning content—such as goal-setting—can be an effective strategy to increase adult learning. Such behavioral tools are only rarely integrated in adult learning programs.

223. Adults face specific socio-economic constraints—these are not always factored in program design. Adult learners have high opportunity costs—in terms of lost income, lost time with children. However, programs often have inflexible, intensive schedules. In Malawi, participation

in training resulted in a decline in personal savings for women at a rate nearly double that of men.[181] Distance to training locations and lack of child care were significant barriers to vocational training program completion for women in India.[182] Dropout rates are often high for adult literacy programs, ranging from 17 percent in Niger to 58 percent in India.[183]

224. One sign that adult learning programs are not always the answer is the low participation in these programs. In Pakistan's *Skills for Employability* program, even among poor households who expressed interest in vocational skills, more than 95 percent did not enroll when given a voucher. Even when government increased daily stipends, moved the training centers to the village, and actively mobilized the population, enrollment did not cross 25 percent.[184] In Ghana, demand for training by informal businesses is low as most managers do not see skills as a constraint.[185]

225. In some cases, the binding constraint might be lack of information—not lack of skills. Information is an important constraint, especially for young adults, whose decisions about which skills to acquire may be based on outdated stereotypes or misguided perceptions.[186] Qualitative work from Uganda shows women in female-dominated trades were frequently mistaken regarding the earnings of women in male-dominated trades.[187] In Sub-Saharan Africa, youth entrepreneurs in the informal economy have limited information about relevant training programs.[188] Further, lack of information about labor market needs may also constrain youth from making informed choices. In India, a program that raised rural women's awareness of and access to jobs in the business process outsourcing sector, led to significant increase in young women's employment in this sector. These women went on to invest more in relevant skills training.[189]

226. In some cases, the binding issue might be lack of credit. Compared to adult training programs, cash (or capital) transfers in some contexts have a stronger impact on self-employment and long-term earning potential.[190] Even when skills are inadequate, training alone may not achieve the desirable results unless complemented by cash or capital support. In Sri Lanka, among a group of businesswomen, the training-only approach did not influence business profits, sales or capital stock. However, the grant-plus-training approach enhanced business profitability.[191] In Liberia, the *Action on Armed Violence* program provided 3-4 months of agricultural training plus US$125 worth of tools and materials to high-risk ex-fighters. While both farm employment and profits increased for participants who received the whole package, men who only attended trainings but received no capital did not increase their farming.[192]

227. There are three promising routes to more effective adult learning programs: better diagnosis and evaluation, better design, and better delivery.

228. Systematic data collection before program design identifies the most important constraints for the target population. Such information can be used to customize skills training as well. For example, through its *Skills Towards Employability and Productivity Skills Measurement Surveys*, the World Bank has facilitated collection of skills-related data from employers and working-age populations in 17 developing countries; these datasets enable policymakers to identify the extent and main features of any skills mismatch. In addition, the World Bank supported jobs diagnostics in Bangladesh, Congo, Dem. Rep., Tajikistan and Zambia to assess what skills investments make the most sense in each context. Systematic data collection during implementation can generate cost-effectiveness estimates for these programs. It may also provide insights on how to improve

design and delivery. Administrative data under India's massive *National Rural Employment Guarantee Act* program has offered powerful insights about local labor markets.

229. Another useful approach is small-scale piloting combined with rigorous evaluation before scale-up. This was undertaken by the World Bank-supported *Youth Opportunities Project* in Uganda. In evaluating early pilots, it is important to test the relative impact of different training components separately. Policymakers can then determine the most cost-effective bundle of inputs. Evaluations also need to have sufficiently large sample sizes and sufficiently long-time frames. Larger study samples are needed if we want to look at how training impacts different recipients differently. For instance, to test if a training impacts men and women differently, a study needs 4 times the sample size than if it simply wants to test how training impacts the overall population.[193]

230. For greater effectiveness, adult learning programs need to be explicitly tailored to adult brains and lifestyles. There is tremendous scope to improve adult learning programs through insights from neuroscience and behavioral economics. Because adult brains learn through practice, it needs to be a core part of such programs. Both practical exercises and visual aids can be effective in adult learning since they assist memory. Explicitly including motivational tools such as a financial reward, work experience, or frequent feedback have all been shown to boost adult learning. An experiment among young adults shows that offering rewards not only improves short-term memory, but also increases post-training long-term performance gains.[194]

231. Adult learning programs need to be flexible—so that adults can learn at their convenience. In a voucher program for vocational training in Kenya, nearly 50 percent of women cited proximity to a training center as a determining factor for choosing the preferred training center and course.[195] Given competing demands on adults' time, training programs with short-modules delivered through mobile applications are particularly promising. Delivering training programs via mobile phones can also shield adult learners from potential stigma.

232. Adult learning programs are more successful when they are explicitly linked to employment opportunities. One popular way to do this is through apprenticeships or internships. They link training to day-to-day experience and provide motivation through the promise of future economic returns. Evidence suggests that skills training programs are more successful when the private sector is involved in developing the curriculum or training methods or in providing on-the-job training via internships or apprenticeships. For instance, Colombia's *Jóvenes en Acción* program combined classroom instruction with on-the-job training at private companies. The probability of formal employment and earnings rose in the short term and sustained in the long run.[196] The program has also demonstrated strong education effects—participants were more likely to complete secondary school and to pursue higher education eight years after the training. The likelihood of their family members enrolling in tertiary education also increased.[197]

233. Success might also depend on addressing multiple constraints at the same time. In some cases, combining training with cash or capital can be a direct way to boost effectiveness. For instance, in Cameroon, 54,000 people who participated in a program that coupled training with financial assistance found employment.[198] Combining skills training with skills certificates, referral letters, and better information about job opportunities may enhance effectiveness, especially for women. For example, in Uganda, workers with more certifiable, transferrable skills have higher employment rates, more earnings, as well as greater labor market mobility.[199] A World

Bank supported program in South Africa is attempting to increase support job search through peer support, SMS reminders, and action planning.

234. Incorporating soft-skills or socio-emotional skills in training design has shown a lot of promise. In Togo, teaching informal business owners “personal initiative”—a mindset of self-starting behavior, innovation, goal-setting—boosted firm profits by 30 percent two years after the program. This approach was much more effective than traditional business trainings.[200] For factory workers in India, acquiring skills such as time management, effective communication as well as financial management increased their productivity.[201]

235. The need for better targeting comes out clearly in the highly variable returns to training. For instance, the World Bank’s *Youth Employment and Opportunities* project in Kenya is tailoring the design of a youth-friendly entrepreneurship aptitude test. India’s *Vikalp Voucher* program incentivizes students to choose between multiple private training providers and courses.

Chapter 4: Returns to Work

236. Zhou Qunfei was born in 1970 in Xiangxiang, China, the youngest of three children. Ms. Zhou grew up in poverty. She was the only one of her siblings to attend secondary school. Despite excelling as a student, she dropped out of school at the age of 16 due to economic necessity. Zhou worked in a glass factory for watch lenses while taking part-time courses at the university. At the age of 20, she was promoted and continued to move up the ranks in the years that followed. By 1993, Ms. Zhou started her own glass workshop overseeing every aspect of the business. In 2003, she expanded from watch lenses to mobile phone lenses. In 2018, Ms. Zhou, the owner of Lens Technology, is one of the world's richest self-made women.

237. If Zhou Qunfei had not been able to move from her village near Changsha to Guangdong, she may not have afforded the same opportunities. If the only type of work available is subsistence farming, then the scope of learning is limited. Just as different subjects in school dispense different knowledge, different jobs lead to the acquisition of different skills. Such skills are not simply confined to cognitive skills. Engaging co-workers, working in teams, managing employees—all build essential socio-emotional skills not easily acquired at school.

238. Learning does not end in school. Work presents a vehicle to accumulate human capital. Raising learning at work increases the base of human capital accumulation as not only do more people work, they also spend most of their lives at work. However, to maximize work as a venue for human capital accumulation, several pressing concerns need to be addressed. First, the exclusion of women from work deprives society of human capital. Second, the poor in emerging economies are concentrated in rural areas in the agriculture sector. Raising the productivity of the sector is crucial to harness human capital accumulation. Third, a prominent feature of emerging economies is the large informal sector. The informal sector provides unstable sources of income while excluding the poor from social protection. Governments need to encourage formal sector jobs as viable alternatives for the poor. The lack of social protection for informal workers means the social contract between the state and its citizens needs to be revisited.

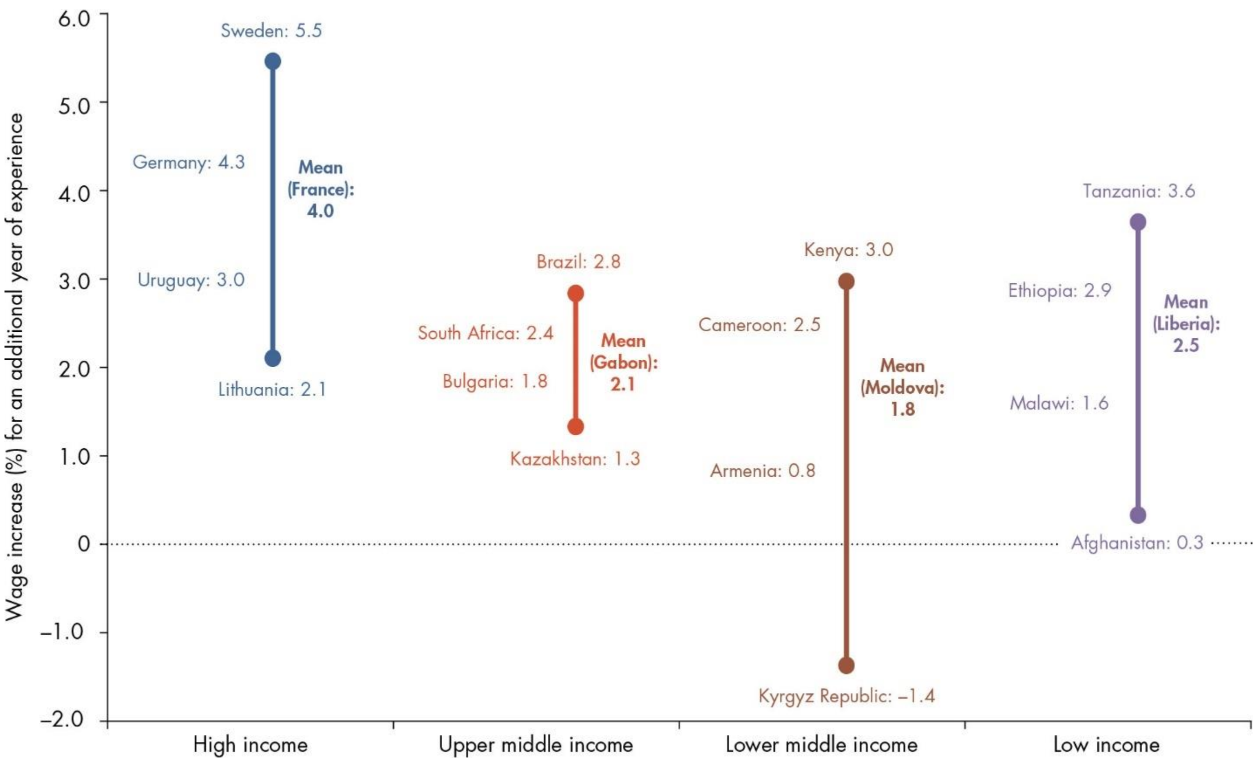
239. To quantify the payoffs to work and school, one must turn to one of the fathers of labor economics—Polish scientist Jacob Mincer. Before Mincer's work, the common belief among his contemporaries was that luck determined one's ability, which in turn determined one's payoffs. Mincer confronted this viewpoint by showing that earnings differentials are determined by deliberate investments in human capital. Human capital grows over the life cycle by means of investments, initially in school, later at work. One can measure the payoff of such investments—an additional year spent in school or work in terms of increased earnings or "returns."[202] For example, a 10.7 percent returns to education, as found by Mincer for white males in non-farm wage jobs, means that an additional year of education increases earnings by 10.7 percent.

240. Workers in emerging economies face lower payoffs to work experience than workers in advanced economies (figure 4.1). In the Netherlands and Sweden, one additional year of work raises wages by 5.5 percent. In Afghanistan the corresponding figure is 0.3. There is a logically consistent explanation for this pattern. Compared to advanced economies, emerging economies have a poorly educated workforce with a larger proportion of workers engaged in manual jobs in the informal sector. Advanced economies, meanwhile, are often at the cutting edge of technology.

Their workers tend to be highly educated, formally employed, and have access to a wide range of jobs intensive in non-routine, cognitive tasks.

241. A worker in an emerging economy is more likely to find herself in a manual occupation that is intensive in physical tasks than a worker in an advanced economy. This may explain the higher returns to work in advanced economies than emerging economies. There is also less scope of learning, as well as risk of automation, in such jobs. This is also reflected in data that shows a positive relationship between self-reported levels of learning at work and the degree of development of an economy.[203] Comparing returns to work between manual and cognitive occupations shows that an additional year of work in cognitive professions increases wages by 2.9 percent, while for manual occupations the figure is 1.9 percent. Elementary occupations and skilled agriculture have the lowest returns. Professionals, managers, as well as technicians have the highest returns.

Figure 4.1. Returns to experience by income group



Source: Authors' calculations using household and labor force survey data from the International Income Distribution Database.
Note: The figure provides estimates of the percentage increase in wages from an additional year of potential experience across 135 economies by income level. The first bar presents the estimates for high income economies. The middle figure presents the mean (4.0 percent). On average an additional year of experience increases monthly wages by 4.0 percent in high income economies. The top figure is the highest estimate for the high income group (Sweden—5.5 percent). Therefore, an additional year of experience raises monthly wages by 5.5 percent in the Sweden. The bottom figure displays the lowest estimate for the high income group (Lithuania—2.1 percent). The same information is repeated for other income groups, as represented by each bar. The top and bottom economies for each region are provided. The methodology follows previous work by categorizing years of experience into bins (Lagakos et al. 2018). The wage growth is estimated for each bin relative to the no-experience bin. The returns to experience is then calculated as an average of these seven bins, using a geometric mean. The top and bottom economy listed for each income group are ranked after the estimates account for income and life expectancy of the economy.

242. Although work provides a venue for a prolonged acquisition of skills after school, it is a complement to schooling, not a substitute. Globally, differences in school education explain much of the observed variation in earnings. One additional year spent in school produces, on average, the same increase in wages as does spending 4 years at work. A worker would need to spend 3 years on the job in Germany, 5 years in Malawi, and 8 years in Guatemala to match the benefit of one extra year of schooling on wages. However, policies that raise returns to work experience are likely to benefit a larger portion of the population in emerging economies given that many individuals are excluded from the school system.

243. Also, educated workers have a greater scope of learning at work than uneducated workers. For each additional year of work experience, poorly educated workers have an annual wage growth of 1.99 percent. Workers with high levels of education, on the other hand, have annual returns to work experience of 2.44 percent.

244. The complementarity between education and learning at work imply that economies with poor schools face a double jeopardy. First, young adults graduating from high school are not equipped with the skills to find work. Second, even if they find work, they learn less than the more educated individuals.

245. Consider Jordan, a country with low returns both on education (5.85 percent) and experience (1.24 percent), together with below average PISA (Programme for International Student Assessment) scores in math, science and reading. A worker who completes secondary education in Jordan and one year at work would earn less than half of the equivalent person in Germany. What is more, by the time she accumulates 30 years of experience, the German worker's wage would already be at least 5 times higher than for the worker in Jordan.

Informality

246. Over a thousand stalls litter the open-air space. Juma works in one of them, repairing bicycles. He works in the *Jua Kali* sector. In Swahili, "*Jua"* means *sun*. *"kali"* means "hot or fierce" a term coined to reflect that the work is done in open spaces under the hot Nairobi sun. Juma's business is one of the 5.8 million unlicensed businesses that make up the informal sector in Kenya.[204] By some estimates, employment in the informal sector in Kenya stands at a staggering 77.9 percent of total employment. Three out of four workers are informal, one of the highest rates of informal employment in the continent. Juma represents the average Kenyan.

247. Informal work is a means of survival. Dalia, one of the 4.5 million people working in the informal sector in Guatemala, dropped out of school as her family could not afford the fees. Forced to provide income for her family, and unable to find formal work, she took up selling trinkets on the street. She earns about US$2.5 a day—barely enough to afford her meals.[205] She worries about inclement weather destroying her wares, as well as having to deal with the insecurity of working on the streets. Such informal entrepreneurs face limited prospects for growth. They exist day-to-day without health insurance, social security or any other form of protection.

248. From the rickshaw pullers in the buzzing streets of Dhaka, Bangladesh, to the mobile fruit vendors of Nairobi, Kenya, the informal economy is omnipresent. Informal employment is more than 70 percent in Sub-Saharan Africa and South Asia, and more than 50 percent in Latin America.

Although informal workers outnumber formal ones, their productivity is significantly lower for the typical developing economy. Informal workers are only 15 percent as productive as formal ones.[206]

249. The informal sector is slow to change. Since 1999, India has seen its IT sector boom, become a nuclear power, broken the world record of number of satellites launched in a single rocket and achieved an annual growth rate of 5.6 percent. Yet, the size of its informal sector has remained around 91 percent. These patterns are not idiosyncratic to India. Informal sectors in emerging economies are a fixture. In Madagascar, the percent of non-agricultural informal employment workers increased from 74 percent in 2005 to 89 percent in 2012. In Nicaragua the size of informality rose from 72.4 percent in 2005 to 75 percent in 2010.

250. The returns to experience for a worker in the formal sector is higher than the informal sector. For instance, a year spent in the informal sector in Kenya raises incomes by only 2.65 percent a year. In contrast, a worker in the formal sector in Kenya raises her income 4.13 percent every year, which is 1.6 times higher than the informal sector. The difference is potent.

251. The disparity in the payoffs to work between formal and informal jobs is a global phenomenon. In Nepal, returns to experience is 1.4 times higher for formal wage workers than informal wage workers. In South Africa, the returns to experience is 1.6 times higher in the formal than the informal sector. In India, returns to experience the formal sector is over twice as high as the informal sector. In emerging economies, on average, the earnings increase for an additional year of work for informal wage workers is 1.42 percent. The figure is 1.84 percent for formal wage workers.

252. Informal workers show resourcefulness to handle the harsh constraints they face. Consider the trash collector in Guntur, Andhra Pradesh.[207] Businesses bought trash from her, sorted it, and sold it to recyclers. To make extra money, she cut the middleman—she sorted the trash herself. She took out loans from microfinance institutions to buy a cart to collect more trash. She got her husband to join in. Soon she was buying trash from others. Eventually she was organizing a large network of trash collectors. Take another example. In the 1970s, near the Mumbai Stock Exchange, a group of women would lay out wet sea sand in the road. The wheels from the cars would dry out the sand. After occasionally scraping the top, the women would sell the dried sand to slums where it would be used to scrub dishes. These women generated income out of nothing.

253. These millions of informal businesses run the by poor are unlikely to make their owners rich. Typically, they have no paid staff, tend to be barely profitable. In Dakar, Senegal, 87 percent of firms with labor productivity below US$10,000 per worker are in the informal sector.[208] Informal firms are run by uneducated owners, serve low-income consumers, and use little capital—informal firms add only 15 percent of the value per employee of formal firms.[209] They also rarely transition to the formal sector.

254. The poor manage to make a lot out of little, but the businesses they run are too small to raise the livelihoods of their owners. The Mumbai sand driers, although creative, have a business that is too small in scale to elevate them out of poverty. Furthermore, these enterprises do not provide a stable stream of income, leaving the poor vulnerable to unexpected events. The question then is why the poor run these enterprises in the first place. The answer is that it is the only option

they have. The enterprises of the poor are a way to have work when formal employment is unavailable.

255. Governments can encourage stable formal private jobs for the poor. Stable jobs are desirable as they allow poor workers to make commitments to expenditures. Consider the zinc factory that enabled a village to prosper in Udaipur District, India.[210] At least one member of every family in the village worked in the factory. The presence of the zinc factory not only provided opportunities for employment, but provided a career—workers could climb up the ladder from the factory floor to foreman. Factory jobs dramatically improve the lives of the poor.[211]

256. Improvements in infrastructure in towns and villages could encourage formal firms to establish themselves near poor workers. While small-scale informal enterprises are unlikely to formalize and grow, the owners of informal firms can obtain formal jobs.

257. Countries with heavier regulations have larger unofficial economies. Such countries also display higher levels of perceived corruption.[212] Complex, costly procedures to start a business discourage entrepreneurs. Removing burdensome regulations may provide incentives for certain firms to formalize, although there is limited evidence of this. In general, worldwide business regulation reforms have not always coincided with corresponding reductions in informality. The success of streamlining business regulations has been observed in specific country contexts.

258. Mexico provides a good illustration.[213] Starting in May 2002 Mexico implemented the Rapid Business Opening System. The program simplified local business registration procedures. It reduced the average number of days 30.1 to 1.4. Number of procedures were reduced from 7.9 to 2.7 on average. Number of office visits required to register a business fell from 4.2 to 1, respectively. The Federal Commission for Improving Regulation (COFEMER), organized the reform. COFEMER coordinated with municipal governments since many business registration procedures are set locally in Mexico. Business reforms led informal owners that were similar in profile to formal wage workers to be 22.3 percent more likely to become wage workers. The evidence suggests that easing regulations encourages the transition from informal firm ownership to formal wage jobs.

259. In some cases, streamlining businesses is not enough, but has to be carried out in tandem with other policies. In Brazil, the Individual Micro-Entrepreneur Program, introduced in 2009, targeted entrepreneurs with at most one employee, and was designed to reduce both dimensions of formality costs: (i) registration (entry) costs; and (ii) the costs of remaining formal, by reducing monthly taxes and red tape. The combination of reducing business registration costs in combination with reducing taxes resulted in the formalization of existing informal firms.[214] Industries eligible to the tax reduction experienced an increase of 4.8% in the number of formal firms. Halving monthly taxes led to a 1.9 percentage points increase in the average entrepreneur's registration rate, from a baseline rate of 20%.

260. Technology can play a role in reducing informality. Non-agricultural informal employment in Peru fell from 75% in 2004 to 68% in 2012. While several factors were responsible for the decline of informal employment including a favorable economy cycle and tax incentives for formalization, an important contributor has been the introduction of e-payroll.[215] E-payroll is an electronic procedure through which employers send monthly reports to the National Tax Authority

regarding their workers, pensioners, service providers, personnel in training, outsourced workers and claimants. The implementation of the e-payroll resulted in the registration of at most 276,000 new formal jobs, after accounting for economic growth.

261. Investment in human capital can reduce informal employment. When young people are equipped with the right skills, they are more likely to obtain a formal job than an informal one. A rigorous experimental evaluation of a youth training program in Santo Domingo, the capital of the Dominical Republic, has shown success.[216] The program targeted youths between 16 to 29 years of age who are out of school and living in poor neighborhoods. The program offered skills training courses that lasted 225 hours: 150 hours devoted to teaching a wide range of low-skill qualifications, such as administrative assistant, hair stylist, or mechanic; and 75 hours devoted to improving the soft skills of participants (mainly, work habits and self-esteem). Courses were followed by a three-month period internship in a private firm. The findings show that the skills investment of a youth training program has a significant impact on the probability of being formal and on labor earnings in an urban labor market. The effect is found to last over time.

Working Women

262. The mural “Making of a Fresco” by Mexican painter Diego Rivera is chosen as the cover of this study. A self-professed communist, Rivera painted a gigantic worker towering over bankers, architects, and artists. But of 19 persons painted, there is only one woman. Although the stature of women in the economy has improved since Rivera’s times, a considerable gulf remains in economic opportunity between men and women.

263. Some societies exclude women from work. Across the world, 49 percent of women above the age of 15 are employed. For men, it is 75 percent. Gender imbalances persist in positions of power. Less than a fifth of firms have a woman as the top manager.[217] These numbers mask wide differences among countries. In Sweden, 61 percent of women are formally employed. In Italy, the figure is 40 percent. In India and Pakistan, only 25 to 27 percent of women are in the labor force. Generally, women work in less economically productive sectors, in occupations with potentially lower on-the-job learning opportunities.

264. The inclusion of women in formal economic activity depends on equal property rights. In ancient Greece, women could not inherit property rights, while in ancient Rome, they had no political rights. In 1804 the Napoleonic Code stated that wives were under the purview of their fathers and husbands. Before 1870, married women in England had no right to claim property, full ownership rights belonged to the husband. Though gender parity has improved around the world, major differences persist.

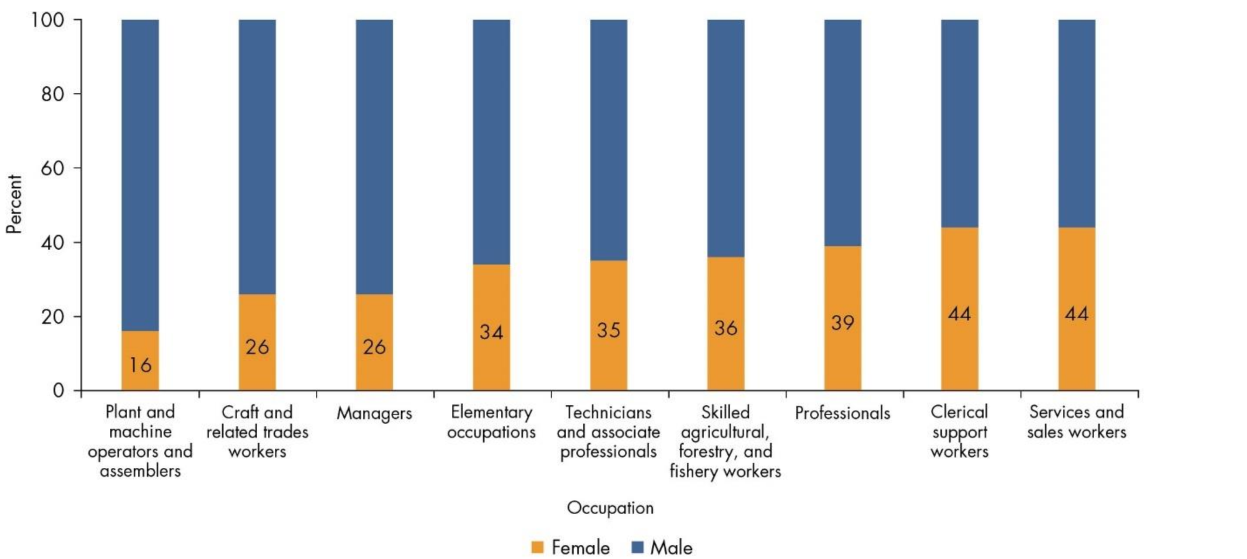
265. Several gender restrictions were transferred from colonial powers to colonies. While colonial powers overturned many of these restrictions at home, the old legal codes were retained in many former colonies. For example, while Spain in 1975 allowed married women to contract in her own name, the 1960 Spanish Civil Code is still maintained in Equatorial Guinea. The United Kingdom’s Mines and Collieries Act of 1842 imposed restrictions on women’s work in mining that are still retained in many commonwealth economies. Remnants of an old 1932 Soviet Law that restricted women from certain jobs is still prevalent in most post-communist countries. In the

early 2000s, Portugal repealed several decrees introduced in the 1890s that restricting women's work. Several of these restrictions are still found in Lusophone Africa and Brazil.

266. Women face legal restrictions in obtaining jobs across many countries. The restrictions are sector-specific. 65 economies around the world restrict women from mining jobs. Women in 47 economies face restrictions in manufacturing while 37 economies restrict women from construction jobs. Furthermore, in 29 out of 189 economies explored, women cannot work the same hours as men.

267. Men outnumber women in every occupation (figure 4.2). Only a quarter of managers are women. About 39 percent of professionals are women. Across the occupations, women have a relatively higher presence in clerical support worker occupations (44 percent), and services and sales workers (44 percent). The lowest is in plant and machinery operators and assemblers—women constitute only 16 percent. Most female managers of formal firms in emerging economies are found to be in the retail sector.

Figure 4.2. Men outnumber women across all broadly-defined occupations



Source: Authors' calculations using household and labor force survey data from the International Income Distribution Database.

268. Women face lower payoffs from work than men in many countries. The returns to work experience for men is 3.1 percent, for women it is 1.9 percent. In Venezuela, RB, men's wages increase by 2.2 percent, while women's do so by only 1.5 percent for each additional year of work. The difference is even larger for countries like Mali, where returns for men are 3.1 percent, while for women are only 1.6 percent. To put this in context, a woman in Mali would need to accumulate almost 2 years more experience for every year her male coworker accumulates to earn the same wage increase. In Denmark, on the other hand, this figure is 5 percent for men, and 4.98 percent for women.

269. The reasons for such different payoffs between men and women are multiple. Consider a working couple from Bangladesh. They are contemplating the decision of conceiving their first baby. However, Bangladesh's laws do not prescribe paid or unpaid parental leave. As such, an equivalent job position is not guaranteed for the mother after giving birth, nursing mothers are not

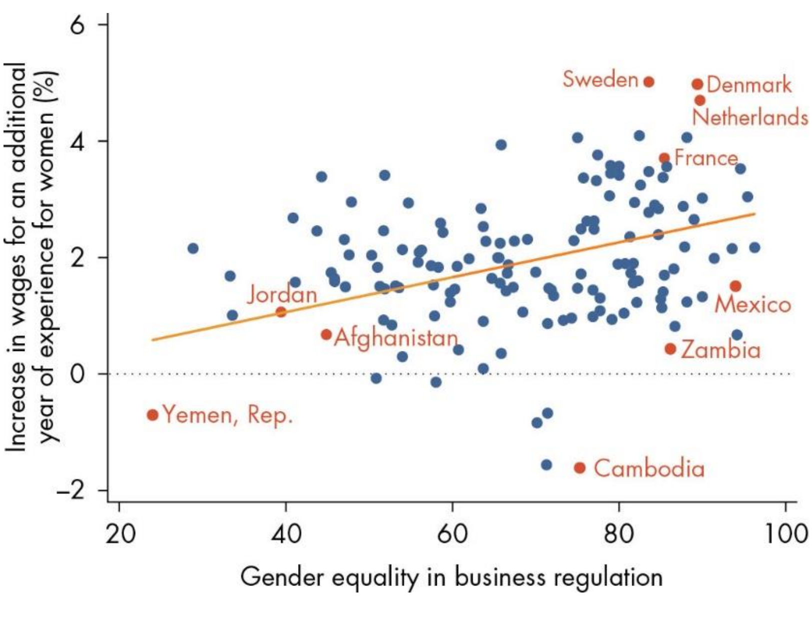
entitled to nursing breaks, and the law does not allow flexible/part-time schedules. Bangladesh's returns to work experience for women is 0.84 percent—almost half of the returns for men. In contrast, in Spain, Sweden and Portugal—all countries with paid leave for both men and women—the returns on experience are similar across genders.

270. Some care should be taken in reading these numbers at face value. The nature of the underlying data means that the exact years of experience cannot be calculated. Women may exhibit lower returns to work experience as they drop out of the labor market quite frequently due to childbearing and childrearing responsibilities. Furthermore, the estimates of work experience payoffs are based only on women who are employed. The inclusion of women who are unemployed may lower the estimated returns even further. This also means that it is unlikely that the low returns to experience estimates for women are a mere statistical artifact.

271. Better information encourages change. As a response, the World Bank began the Women, Business and the Law project in 2008 to document gender legal disparities for 189 economies. Removing legal restrictions for women can be powerful. Just mandating a non-discrimination clause in hiring in terms of gender can increase women's employment in formal firms by 8.6 percentage points.[218] Similarly, mandating paternity leave to encourage a more equitable distribution of childrearing activities between men and women can raise the proportion of women employed in formal firms by 6.8 percentage points.[219]

272. The larger the number of legal restrictions women face, the lower the payoff from working (figure 4.3). At one end of the spectrum, France, Sweden, as well as the Netherlands have fewer legal gender restrictions and higher returns to work for women. In Afghanistan and Jordan, where women and men are treated differently by law, the payoff from work for women is among the lowest. Increasing legal gender-specific restrictions have been found to discourage women from both owning and managing firms.[220] There is a possibility that it is not the changes in the laws that is causing higher returns to experience for women, but a third factor that is causing changes in both. Regardless, laws are relatively easy to change and thus a natural first step.

Figure 4.3. More legal restrictions on women at work corresponds to lower wages



Source: Author's calculations based on World Bank (2018c) and household and labor force survey data from the International Income Distribution Database.
Note: The World Bank's Women, Business and the Law measure of gender legal equality scores economies based on whether they treat men and women differently. The higher the score, the greater the gender legal equality.

273. Countries are reforming. Following changes to the family code in Congo, Dem. Rep. in 2016, women can formalize their businesses, open a bank account, get a loan, sign a contract, register her business and register land without her husband's permission. Zambia's Gender Equity and Equality Act of 2015 prohibits gender discrimination in employment. Iraq guarantees workers a similar position with the same wage after maternity leave. China increased paid paternity leave. Afghanistan forbids sexual harassment in employment and education. In total, 65 economies reformed towards gender equality from 2015 to 2017.

274. Empowering women by reforming discriminatory laws is just one way to improve their well-being. Programs that empower women by giving them access to training and assets are seeing success. In rural Bangladesh, poor women work as maids or agricultural workers. Wealthy women rear livestock. A nationwide program empowered poor women by providing them livestock in combination with skills and training on their legal, social and political rights. The program changed lives. Poor women started rearing livestock, spending less time as agricultural workers or maids. As a result, for many of the women, their earnings rose, the value of their livestock increased, they accumulated business assets, they were more likely to own land, and they lifted themselves out of poverty. These improvements lasted seven years after the program.[221] A similar program in Uganda empowered adolescent girls by providing them vocational training together with information on sex, reproduction, and marriage to counter early childbearing. Four years after the program, women were more likely to engage in income-generating activities.[222]

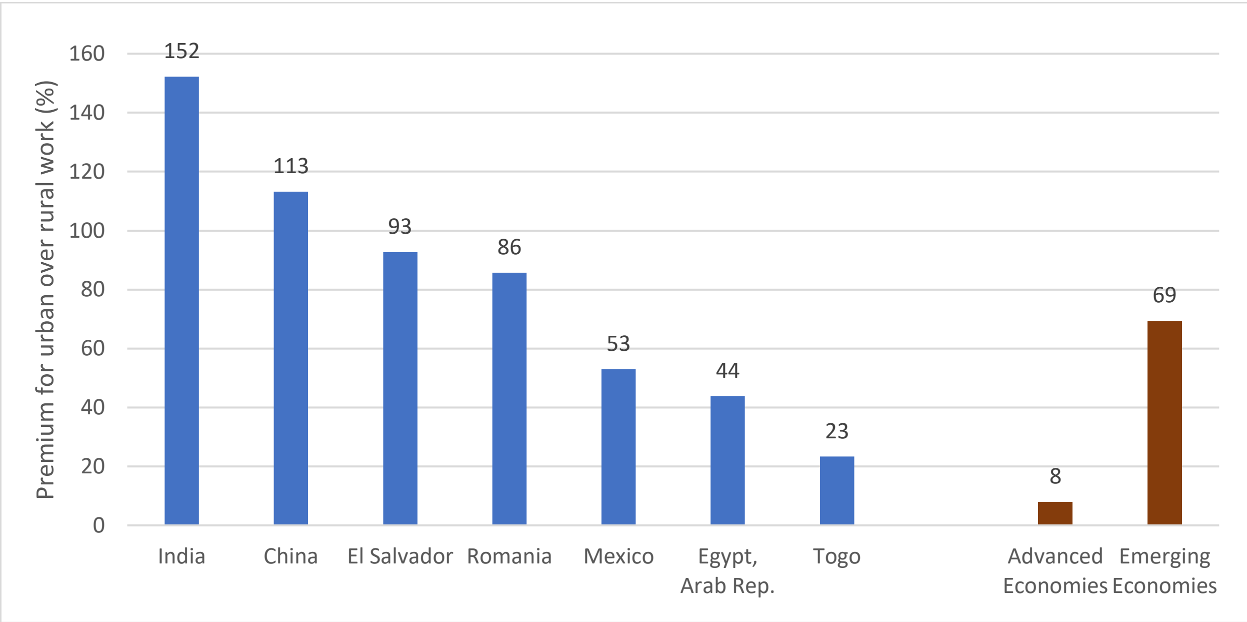
275. Policies can reduce restrictions that shackle women from entering labor markets or transitioning towards productive work. For instance, the Economic Empowerment of Adolescent Girls and Young Women project launched by the Liberian government in 2009 seeks to provide young girls with both in-classroom training—focused on life and technical skills highly demanded in the market—and follow-up job placement support (to either enter a paying job or start a new business). The program had significant impacts on different aspects of participants' lives: employment and earnings increased by 47 and 80 percent respectively; participating women saved US$35 more; their self-confidence, life satisfaction, and social abilities improved as well. Moreover, households with participating women improved their food security by increasing the consumption of high-value proteins while decreasing the likelihood of food shortages.[223]

Working in Agriculture

276. Although agricultural employment declines as countries develop, it remains the main economic sector in low income economies. In 2017, agriculture accounted for 68 percent of employment in low income economies. Because the livelihoods of the majority depend on the agriculture sector, improving agricultural incomes is an effective way of reducing poverty.[224] However, the combined forces of automation and open trade work against agricultural employment in developing countries. Capital-intensive agriculture in advanced economies may be reducing import demand.

277. The result is faster urbanization in Africa and South Asia, where the challenges of moving to the city proliferate. On the one hand, earnings could be higher— in emerging economies an additional year of work experience in the city is worth 2.2 percent increase in pay. The returns to work in in urban areas are 1.7 more than rural areas, or a premium of 69 percent. This is reflective of a global pattern (figure 4.4). In Indonesia and Mexico, the returns to work are 50 percent higher in urban areas than rural areas. For India, China and Vietnam, payoffs to work in urban areas are double that of rural areas.

Figure 4.4. Rural areas provide lower payoffs than work in urban areas



Source: Authors' calculations based on household and labor force survey data from the International Income Distribution Database. Note: The figure provides estimates of the premium (%) of an increase in wages from an additional year of potential experience for urban workers over rural workers. For example, in China the returns to potential experience for an urban worker is more than twice as much of a rural wage worker, or an 113 percent premium.

On the other hand, the opportunities in the city can be harnessed only under certain circumstances. Workers would need to have a certain level of education to access most of the better jobs in the cities. In a number of developing economies stringent workplace regulation deters firms from employing less productive workers, pushing them into the informal economy.

278. The constraints faced by the poor in moving to the city have been well illustrated. In India, for instance, workers in Orissa provided several reasons for not staying in the city.[225] First, there is no housing—the extreme poor squeeze themselves often in swamps or slums right next to garbage dumps. In contrast, the villages offer more open greener and quieter spaces. If one moved the whole family to the city, there are considerable risks. What happens in the children get sick—sure, healthcare is better but will anyone lend you money if it is needed? The connections developed in villages serve as crude safety nets for the vulnerable lives of the poor.

279. Overall, workers in emerging economies experience half of the payoffs to work (1.96 percent) than workers in advanced economies (4.01 percent). Governments may be tempted to

move poor workers from villages to cities to raise the overall payoffs in the economy, thereby reducing poverty. However, this movement is unlikely to considerably narrow the payoff gap between emerging and advanced economies. The following two scenarios illustrate this result. Imagine all the workers in Togo moved around until the share of workers in urban areas matched that of an advanced economy such as Spain. Also assume nothing else changed in Togo—the rural and urban areas had the same returns as before. This movement would narrow the Togo-Spain gap in aggregate payoffs by 22 percent. Now consider an alternate scenario. No workers moved in Togo, but both the urban and rural areas raised their payoffs to match Spain. In this scenario the Togo-Spain gap in aggregate pay offs would fall by 77.4 percent.

280. A similar hypothetical story plays out for Bangladesh. Adopting Spain's employment pattern would just narrow the payoffs gap between Bangladesh and Spain by 7.2 percent. In contrast, achieving Spain's payoffs to work in urban and rural areas would narrow the gap by 91.5 percent. The implication is that improvements in rural areas are necessary to narrow the payoffs gap between emerging and advanced economies. This is what has also been found by studies in Kenya and Indonesia.[226]

281. Between the bustling cities and the subsistence-oriented villages lie secondary towns. They serve a special role in facilitating the transition of rural workers to off-farm employment, much of it related to agriculture. Secondary towns inhabit an important space between villages and cities, enabling movement up and down the value chain. Life histories of migrants from Tanzania confirm these insights, further highlighting the role that secondary towns can play, in facilitating the transition out of agriculture.[227] In early stages of development, growth of secondary towns may do more for rural poverty alleviating than big cities, although in later stages of development, big cities take over.[228]

282. There is wide acceptance that as economies go down the development path, agricultural productivity rises, unlike the informal sector. There are many steps governments can take to ensure agricultural jobs in rural areas provide sufficient income for the poor in parallel to increasing productivity. The challenges facing farmers in emerging economies are numerous—they lack access to essential inputs and services that increase their productivity. Smallholders are not integrated with value chains. Entrepreneurs face numerous obstacles to their operations. Value chain development allows farmers to capture the urban demand for higher value agricultural products such as dairy, meat, fruits or vegetables. Poverty reduction is faster when agriculture transforms from staple to non-staple crops. This requires raising staple crop productivity well beyond the levels currently achieved in Sub-Saharan Africa. This section explores three areas where policymakers have made strides: programs that transfer knowledge, initiatives that exploit digital technologies to increase access to input, output and capital markets, and improvement in regulatory systems.

283. Training farmers on the best farming techniques can raise productivity. This training is typically done through agricultural extension work. Several projects expand training programs or collaborations to improve the exchange of information. Sometimes this has been combined with increasing access to finance or provisions of agricultural inputs as an impetus for improving agricultural productivity. Providing resources to cooperatives can connect them to agribusinesses along the value chain. JD Finance, the fintech arm of a leading Chinese e-commerce platform

JD.com, has been collaborating with cooperatives to provide with farmers not only microcredits but also aquaculture monitoring and logistics management techniques.

284. For instance, a few years back, Safiata faced several challenges in her cocoa processing business located in the Sambirano region, Madagascar. She faced difficulties finding buyers for her cocoa beans. She had to accept unfair prices that led to operating losses. Following participation in the local government's *Integrated Growth Poles Project*, supported by the World Bank, Safiata received training in improved cocoa processing practices coupled with business management skills. Safiata can upgrade to premium quality cocoa that conferred several benefits. Exporters seek her cocoa, paying prices that are 50 percent higher than her previous cocoa. Premium cocoa can also be stored longer, allowing Safiata to wait for better offers for her cocoa without worrying about it deteriorating. She developed new contacts through the project that allowed her to diversify her activities. Two of her children completed school and then went on to university, choosing their own paths. To date, beneficiaries of the Integrated Growth Poles Project, like Safiata, have seen an average increase in net revenues of 47 percent.

285. In the past, when Jan Agha's animals suffered a bad cut, he would put chewing tobacco, petrol or mud to stop the wound. He laughs thinking about how his poor animals must have suffered. Through the Farmer Field School in Merak Bela, Nangarhar province in Afghanistan, Jan Agha is one of many livestock farmers who learned to use iodine instead. The classes—twice a month—are an important part of the National Horticulture and Livestock Project, a government initiative supported by the World Bank. Agha, a father of 11 children, says his income has tripled since the project—his cows can produce almost 10.5 liters a day, while before they produced just 3.5 liters a day. Farmer Field schools have also found success in East Africa.[229]

286. A year ago, Marie Behane produced only 8 bags of sorghum in the Far North region of Cameroon. In 2017, she produces 22 bags of sorghum. Much of this can be credited to the support from the Agriculture Investment and Market Development Project. To aid farmers such as Marie, the government established partnerships between producer organizations, agribusiness purchasers, and financial institutions to improve the sorghum sector activity to meet agribusiness needs. Marie's membership of the Regional Council of Farmers' Organizations in Northern Cameroon cooperative conferred to her many of the project's benefits. Her increased earnings allowed her to send her kids to school. She can afford to get them treatment when they fall sick.

287. The effectiveness of agricultural training can be improved. One way is by activating social ties in villages to encourage peer leaning. A recent study ran a series of training experiments with rural female farmers in Uganda that lead to the conclusion that encouraging competition among women farmers resulted in greater learning in training sessions.[230] Digital Green amplifies agricultural extension services by leveraging knowledge and participation of local communities to produce low cost videos to spread information that is within the local context. Pursuing innovative methods to improve learning in training raises the returns of the training budgets.

288. Mechanization has in the past failed to take a foothold in Sub-Saharan Africa. This failure has warranted some skepticism on ambitious predictions of technological transformations in agriculture. However, there are signs that mechanization is taking hold, facilitated by information and communication technologies. Real time measurements allow farmers to make better real-time decisions. Aerial images from satellites, drones, or soil sensors improve measurements and allow

for the monitoring of crops in real time. Detailed, precise information inform farmer decisions on how much fertilizer and irrigation is needed for their crops.

289. Many farmers in emerging economies do not know if they are getting the best price for their crops. TruTrade in Uganda is an example of digital technology can bridge this information gap. TruTrade uses online applications to allow price setting, track the movements of produce, and payments. TruTrade connects smallholders to buyers while enforcing quality and transparency. This creates an atmosphere of trust. Farmers receive good prices and reliable access to markets. Traders can build relationships as a trusted provider, thereby growing their business.

290. Mobile technology in Kenya has also been used to reduce administrative and assessment costs of insurance scheme. A good illustration is the app Kilimo Salama (Swahili for "Safe Farming"). When insurance products are sold, the seller activates the insurance policy using the Kilimo Salama application on by scanning a product-specific bar code with the camera phone, entering the farmer's mobile number, and connecting the farmer to the local weather station. Thirty solar-powered weather stations automatically monitor the weather. An SMS is received to confirm the insurance policy. The indemnity payments are made through the M-PESA platform. The Kilimo Salama project has evolved into ACRE Africa. By 2017, over a million farmers in Kenya, Tanzania, and Rwanda have been insured.[231]

291. Orchards in the Kastamonu Province in Turkey face two main challenges—pests and harmful frost weather. National weather broadcasts are not useful. For one, they happen in the evening—too late for producers to react. Second, the weather forecasts were at an aggregated level, and thus not reflective of local conditions that tended to vary by farm. Furthermore, weather forecasts cater towards urban areas, therefore do not account for the cooler weather in rural areas. The Government of Turkey in collaboration with international donors established five mini-meteorological stations in rural areas throughout the province along with 14 reference farms to measure rain, temperature, as well as pest cycles. Producers were informed regularly though SMS. They were thus able to react to prevailing local conditions. Costs fell dramatically for producers in the first 2 years. Pesticide applications dropped by 50 percent.[232]

292. Regulations play a role in shaping the business environment for players in the agricultural sector through their impacts on costs, risk, and competition. High transaction costs can reduce trade volumes, restrict access to finance, as well as lower productivity. Faced with such challenges, firms are liable to slip into the informal economy.[233] The right institutions and regulations can enable agricultural entrepreneurs to integrate into formal markets.

293. Kenya used to be the world's leading producer of pyrethrin, an organic insecticide made from the pyrethrum flower. However, the stated-owned Pyrethrum Board of Kenya had exclusive rights to purchase and process pyrethrum flowers. After foreign competition caused Kenya's global market share to drop from 82 percent in 1980 to 4 percent in 2010, new legislation was passed, working with the World Bank, to eliminate a ban on private investment in the sector. By April 2018, three firms had obtained pyrethrum processing licenses; two other investors are awaiting licenses. The move benefits 43,000 farmers who can sell pyrethrum in a more competitive market.

294. Fertilizer use in emerging economies is often constrained by high prices and scarcity due to inadequate administrative procedures and infrastructure. Lengthy and expensive procedures to register fertilizer may limit their availability, thereby reducing yields. In Malawi, it takes 913 days to register fertilizer, costing about thirty times the income per capital to register. In Nepal, it takes 1,125 days, costing more than 6 times the per capita income to register. When new rules for fertilizer registration were introduced in Honduras as part of a World Bank project, three hundred new products were registered in 2013 compared to only 68 in 2011.

295. Finance is another important component of a commercialized agriculture sector. Working capital, long-term credit, access to savings accounts, as well as payment services can be used to expand operations. Financial regulations that support innovative ways of delivering financial services, can increase access to finance in rural areas. In Mozambique, following an amendment to the law to allow for agent banking activities in 2015, Moza Banco serves the unbanked population in the country, often located in rural areas, through retail stores or postal offices. Ghana adopted a new law the same year to allow both banks and non-bank institutions to issue e-money.

Chapter 5: Strengthening Social Protection and Labor Policies

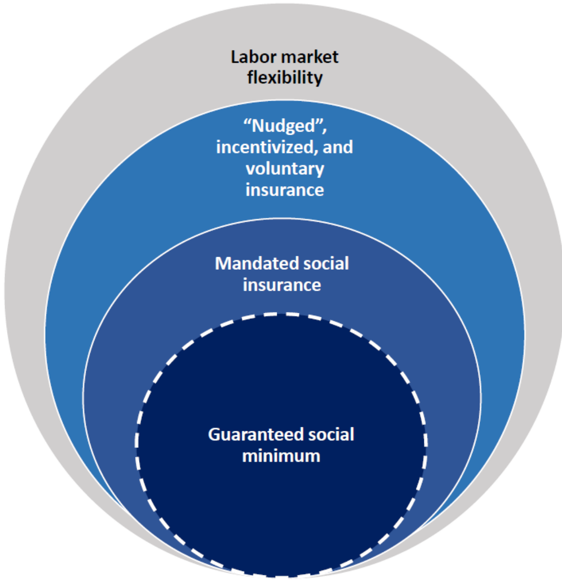
296. Otto von Bismarck, Germany's Chancellor in the late 19th century, is widely accredited for having invented social insurance as we know it: one where benefits to formal workers are financed by dedicated taxes on wages. What is less known, however, is that this model was Bismarck's plan B. The Chancellor's original intention was to create a system of pensions financed via taxes on tobacco. As his plan failed, Bismarck eventually resorted to wage-based, contributory financing. The contributory model is still in place in most countries.

297. While the Bismarckian arrangements have served many countries well, in a range of developing countries the model remained mostly aspirational due to informality. Many workers lack formal protection. In low-income countries, social assistance and insurance only cover 18 and 2 percent of people in the poorest quintile, respectively. The corresponding rates increase to 77 and 28 percent in upper-middle-income settings.

298. Uncertain labor markets demand effective social protection while ensuring that firms and workers can respond to changes in technology. These developments are stimulating a reconsideration of how social protection, including labor market institutions, can reduce poverty, smooth consumption, as well as redistribute wealth.

299. The chapter outlines how three main components of social protection systems—a guaranteed social minimum against poverty (with social assistance at its core), social insurance, and labor market regulation—can manage these labor market challenges (figure 5.1). The envisioned system reinforces the role of social assistance. Already spurred by equity concerns, the development of adequate social assistance is underscored by increasing risks in labor markets and the need to ensure adequate support irrespective of the form of labor contract. A guiding principle for strengthening social assistance is that "progressive universalism". The ambition of this approach is to significantly expand coverage and, in the process, prioritize the poorest people. This model of incremental scale-up occurs while navigating the fiscal, practical and political trade-offs that incremental levels of coverage entail.

Figure 5.1. Social protection and labor regulation for the changing nature of work



Source: Adapted from World Bank 2018d.

300. A solid base of social assistance should be complemented with adequate insurance that does not fully depend on having formal wage employment. Such arrangements would, first, provide basic universal coverage, subsidizing premiums for at least the poor. This would top up social assistance. In addition, mandatory earnings-based contributions would be necessary. At least initially, this mandate would apply only to formal workers. A lighter mandate could attract greater compliance. Finally, additional insurance could be achieved through voluntary saving schemes "nudged" by the state. Disentangling redistribution from savings, meanwhile moving the redistributive function to the guaranteed societal minimum, would reduce labor costs. This change may reduce incentives to replace workers with robots.

301. Taken together, the expanded coverage of social assistance and the provision of subsidized social insurance imply a stronger, ambitious role for government. For instance, the desirable level of spending for a societal minimum in developing countries may, in many cases, be significantly higher than average expenditures in social assistance (currently at 1.5 percent of GDP). Also in this case, the concept of progressive universalism would call for gradual expansion in line with prevailing fiscal space.

302. As people become better protected through enhanced social assistance and insurance systems (including its mandated component), labor regulation could, where appropriate, be made more flexible to facilitate work transitions. Current labor regulations are often used to offer protections that social assistance and insurance systems could instead provide more effectively. For example, if aiming to provide a livable income, countries could choose to use more social assistance to supplement earnings and relax pressure on minimum wages that are set at levels that exceed labor productivity. Similarly, income support to the unemployed may be provided by unemployment benefits rather than via severance pay.

303. Enhanced social assistance and insurance can reduce the burden of risk management on labor regulation. In doing so, it may protect informal workers. Lower labor costs can improve the adaptability of firms in the changing nature of work, meanwhile allow for more formal employment, especially of new labor market entrants and low skilled workers. However, there needs to be a proper balance between regulation and jobs creation. Complementary support for reskilling, as well as new arrangements for expanding workers' voice, become even more important. Indeed, effective representation of both formal and informal-sector workers plays a critical role in ensuring that the 'security' element of 'flexicurity' is effectively preserved.

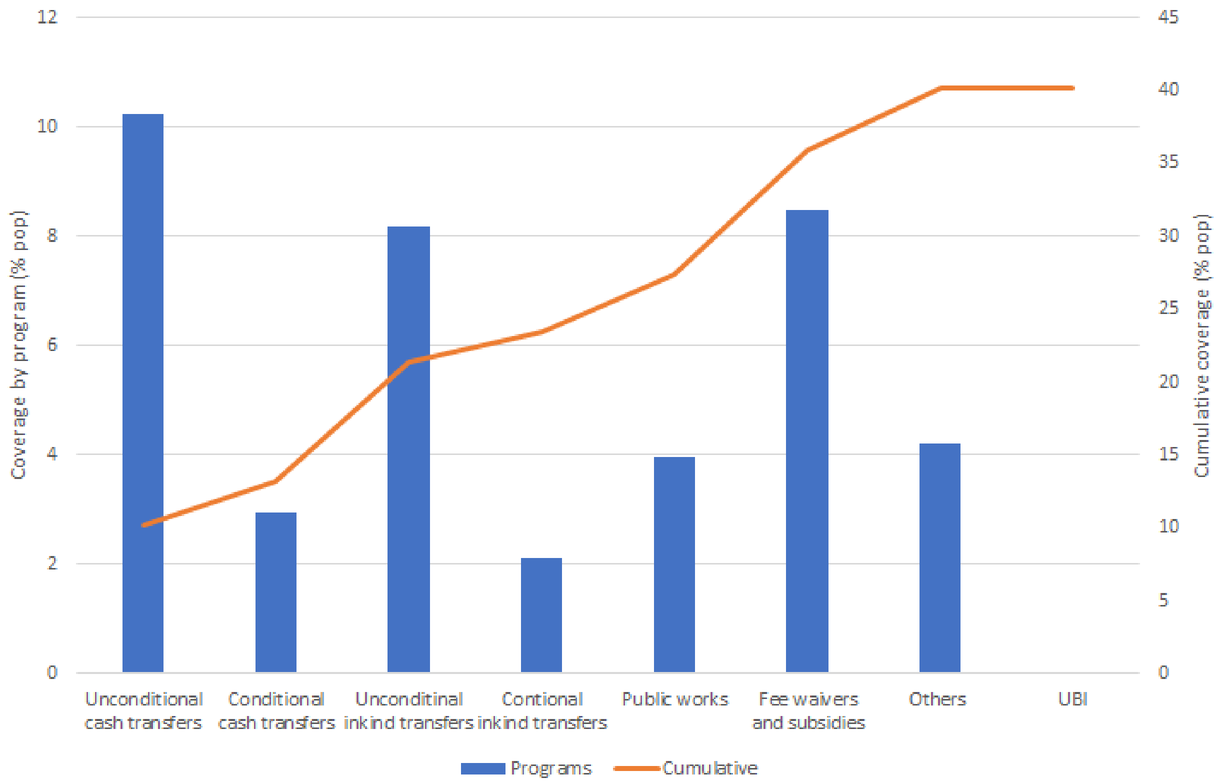
Social Assistance

304. "All poor people should have the alternative… of being starved by a gradual process in the home, or by a quick one out of it". The words of Charles Dickens' *Oliver Twist* provide a vivid illustration of social assistance practices in 19th Century Britain. The approach, codified in the Poor Laws of 1601 and 1834, established harsh criteria for accessing social assistance. The Laws also influenced thinking about social assistance in other contexts for centuries. It was only 70 years ago that the "Beveridge Report", with its recommendations embedded into the National Assistance Act of 1948, marked the end of the era evoked by Dickens.

305. In subsequent decades, social assistance began to spread in developing countries. Trends in social assistance attest to significant progress across the globe: out of 142 countries in the World Bank ASPIRE database, 70 percent have unconditional cash transfers in place. 43 percent introduced conditional cash transfers (CCTs). A total of 101 countries have old-age social pensions in place.[234]

306. Developing countries are continuously expanding social assistance programs: the coverage of the national CCT scheme in Tanzania increased twentyfold from 0.4 percent of the population in 2013 to 10 percent in 2016. An equal level of coverage is achieved by the Productive Safety Net Program in Ethiopia. About 20 percent of the population is served by the *Pantawid* program in the Philippines and the Child Support Grant in South Africa. Overall, the cumulative coverage of social assistance is 40.1 percent of the 5.1 billion people represented in surveys included in ASPIRE; however, the largest among single programs reaches about 10 percent of the population (figure 5.2).

Figure 5.2. Global coverage of social assistance by programs and cumulatively (% of population)



Source: Authors' calculations based on ASPIRE database - www.worldbank.org/aspire.
Note: Number of countries: SSA (31); EAP (10); ECA (20); LAC (20); MNA (7); SAR (8). This figure underestimates total coverage because household surveys do not include all programs existing in each country. The figure does not account for possible overlap among programs (individual receiving more than one program). The number of individuals is estimated by multiplying the percentage coverage rate by the expanded population of the household survey, using household weights. Coverage indicator includes direct and indirect beneficiaries (individuals who belong to the same household where at least one person receives a benefit). Unconditional cash transfers also include social pensions.

307. Technology can support social registries in improving access to and coordination among different programs. This generates cost savings by reducing inclusion errors. In Pakistan, the social registry, which includes 85 percent of the population and serves 70 different programs, contributed to savings of US$248 million. In South Africa and Guinea, a similar process saved US$157 million and US$13 million, respectively. Technology reduces costs. In Argentina, linking 34 social program databases to the unique ID number of beneficiaries revealed inclusion errors in eligibility for various social programs. This led to US$143 million in savings over an 8-year period. In 2016, Thailand eliminated 660,000 applicants out of 8.4 million based on cross-checking databases using unique national ID numbers.

308. Technologies enhances the delivery of social protection programs. In Mexico, geospatial mapping tools are used to identify the most vulnerable areas in cities, including at the block-level. Mobile phone data was leveraged to construct poverty maps in Côte d'Ivoire. In Benin, GPS-based data collection located households living in urban settlements with no addresses. Digital

technologies also deliver assistance in fragile settings. In Lebanon, electronic smartcards provide food vouchers to nearly 124,000 Syrian refugee households.

309. Payment technologies are also making a difference. In the Labor Intensive Public Works scheme in Ghana, the digitalization of paper-based transactions and a wider use of biometric machines reduced overall wage payment time from 4 months to one week. In the Indian state of Chhattisgarh, electronic devices for the Public Distribution System of food assistance contributed to a reduction in 'leakages', from 52 percent in 2005 to 9 percent in 2012.[235]

310. Social assistance generates productive effects through multiple channels. Empirical studies demonstrate that cash transfers are spent on food, health care, education and other desirable goods.[236] Transfers can enhance the human capital of current and future generations. For example, a systematic review of 56 cash transfer programs found significant improvements on school enrolment, test scores, cognitive development, food security, and usage of health facilities.[237] In Mexico, the *Prospera* CCT program improved motor skills, cognitive development and receptive language of children 24-68 months old. In Kenya, secondary school enrollment increases by 7 percentage points for children in the Orphans and Vulnerable Children program. These gains are usually largest for the poorest, rural, girls or ethnic minorities. Moreover, transfers can reduce stress, reduce depression, increase mental bandwidth, and foster more involved parenting.[238]

311. Social assistance programs also have impacts on households' assets and livelihoods. In a meta-analysis of impact evaluations from Africa, livestock ownership increased on average by 34 percent and ownership of durable goods (e.g., inputs for household enterprise) by 10 percent.[239] Programs are increasingly reinforcing such effects on livelihoods by adding elements of awareness-raising on nutritional risks, financial inclusion, entrepreneurship training, and asset transfers.[240] In other words, social assistance, especially "income support plus" interventions, can raise productivity and resilience among poor informal sector workers.

312. In advanced economies, social assistance faces the challenge of low uptake amongst eligible beneficiaries. For example, it is estimated that in the European Union only about 60 percent of social benefits are claimed.[241] This challenge stems from a lack of awareness of benefits, misunderstanding eligibility rules, perceived stigma associated with assistance, bureaucratic obstacles, and the opportunity costs of accessing benefits.

313. In some middle-income countries with high levels of coverage, policymakers have weighed the possibility of targeting by "excluding the rich" instead of selecting beneficiaries from the bottom. This approach is often considered in the context of large-scale energy and food subsidy reforms. While it does not eliminate exclusion errors, these tend to occur higher up the income distribution. As such, "targeting from the top" may have less problematic social consequences. The political viability of such a proposition may then depend on how the middle-class and various interest groups are set to benefit (and in part pay for) the program as part of a wider social contract.[242]

314. Where deprivation is more widespread, households across the income distribution face similar levels of need. Such continuity in welfare distribution may contrast with sharp, somewhat arbitrary measures of poverty or eligibility criteria.[243] Even where poverty is less prevalent, there can be a concentration of similarly-vulnerable people around poverty lines. For instance, in some

middle-income countries people living on US$6 a day, or just above the poverty line, face a 40 percent probability of falling back into poverty.[244] In fact, poverty is often dynamic: in Africa, one-third of the population is persistently poor, while another third moves in and out of poverty over time.[245]

315. In low-income countries, only 18 percent of the poorest quintile receives some form of transfer. In those contexts, the combined effects of fiscal, administrative and informational constraints can lead to significant under-coverage of the poorest households.[246] Overall, social assistance is mildly progressive: out of the benefits provided in developing countries, about one-third accrues to the poorest quintile while two-thirds are spread across the income distribution.[247]

316. These facts suggest the need for broader and permanent coverage than most programs currently provide. While the direction of travel towards more universal approaches is desirable—including a high-coverage "guaranteed societal minimum"—the specific shape of such minimum carries different technical, budgetary, and political challenges. Universal approaches can reduce or eliminate hurdles around program fragmentation, eligibility determination, and social tensions, but require significant additional resources. As such, expansions should be paced with resource mobilization capacities. The choice of larger or smaller tax-transfer policies have different distributional effects as well as diverse roots of political support.

317. The principle of "progressive universalism" could be applied to the idea of establishing a guaranteed societal minimum. The concept is in line with the United Nations global commitments to "…implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable". Progressive universalism is a guide to build such floors from the bottom-up.

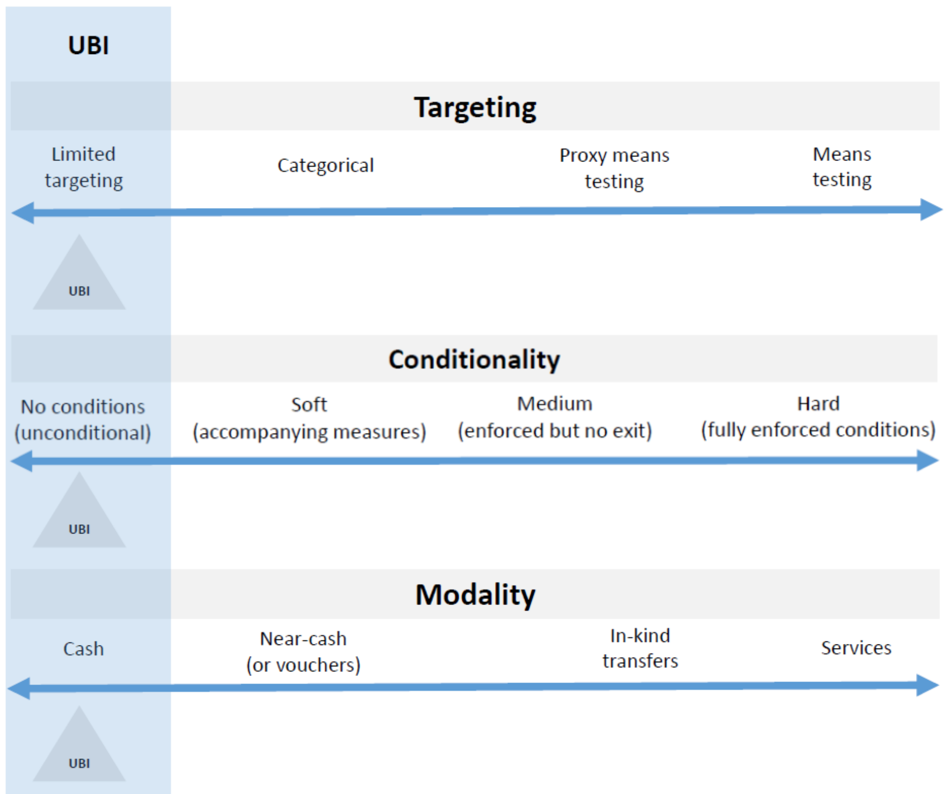
318. Progressive universalism is anchored in four considerations. First, it recognizes that while an expansion of sufficient scale and intensity to be universal might be needed, coverage would ultimately depend on country-specific factors (e.g., preferences toward redistribution, fiscal space, political economy, and implementation capacity). Second, the pace of scale-up matters: gradual, sequential expansions might be more realistic, especially where capacity constraints are present. Third, as countries expand social assistance, those at the bottom of the distribution—who are intrinsically more difficult to reach—should benefit before or at least at the same time as others in society. Fourth, those at the bottom need to be supported adequately, meaning that they are likely to need more support than others. For example, average benefits represent between 13 and 18 percent of the poor's income or consumption in most developing countries. These amounts are too modest to make a dent in poverty.

319. These basic considerations have important implications. For instance, they place a higher societal weight on minimizing exclusion errors among the poor rather than on reducing errors of inclusion of the better-off. Success postulates an expansion starting from the poorest and vulnerable. Therefore, progressive universalism requires information systems that identify and prioritize those most in need during the longer-term process of expansion. Targeting and progressive universalism are compatible, mutually-reinforcing concepts.

320. As part of the expansion options, a hotly-debated idea is that of Universal Basic Income (UBI). A UBI enshrines the notion of building a guaranteed social minimum through a single,

simple program presenting three design features. First, the program is meant for every individual independently of income or employment status. Second, it is provided in the form of cash, as opposed to in-kind transfers and services. Third, there are no conditions attached or reciprocal co-responsibilities to be fulfilled by participants (figure 5.3).

Figure 5.3. Main design traits of a UBI



Source: Authors' calculations.
Note: each banner includes illustrative alternative design traits.

321. A UBI is not an alaternative to health, education or other social services. The program may be additional to current social asistance programs, and more likely replace some of the programs pursuing income support functions. A UBI may be designed with different objectives in mind, from poverty reduction to ensuring a livable income. The discussion here focuses on the former. While on the benefit side UBI provides the same level of transfers to the entire population, on the financing side those benefits can be clawed back from the rich (e.g., through a progressive income tax). When both tax and benefits are considered, a UBI is conceptually-equivalent to a Negative Income Tax (NIT): such option provides benefits to lower-income beneficiaries through the tax system, with "tapered" benefits gradually declining as incomes rise.[248]

322. Part of the literature discusses the potential for UBI to provide income security in cases of mass, automation-induced unemployment. The idea has also been explored as a vehicle to enhance accountability and improve efficiency in public spending in oil-producing countries. Another branch of literature examines how UBI fulfills the rights agenda. Importantly, these distinct

narratives imply different objectives for a UBI. To gauge the appropriateness of the program it is important to clarify which of the many goals it intends to pursue.

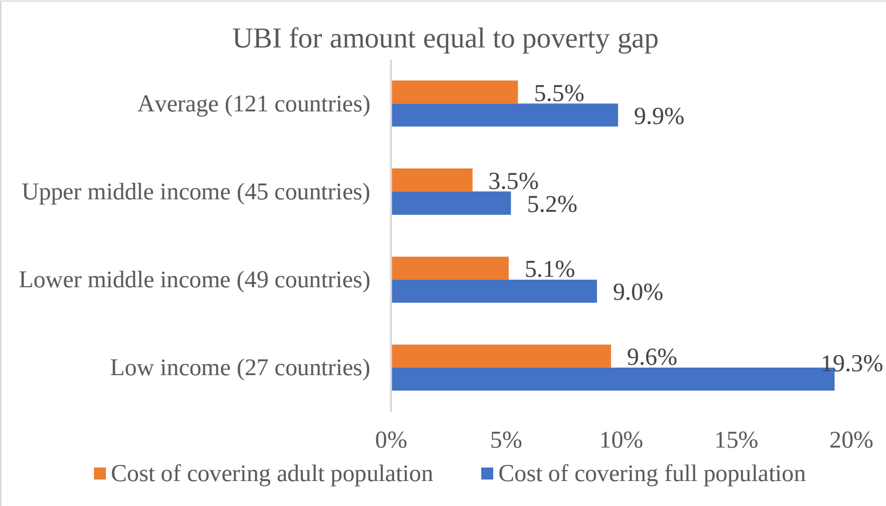
323. In some contexts, the idea is being seriously debated. For example, India's Chief Economic Adviser, Arvind Subramanian, predicted enthusiastically in 2017 that "… I can bet, within the next two years, at least one or two [Indian] states will implement universal basic income".[249] But what do we know about how UBI works in practice? For the moment, UBI is largely a theoretical proposition. Only one country, Mongolia, had a short-lived UBI covering the entire population. The program lasted 2 years (2010-2012) before being downsized due to fiscal constraints. When mineral prices collapsed, so too did the scheme.[250] Iran also had a program resembling a UBI for one year: in 2011, energy subsidies were replaced by cash transfers to 96 percent of the population.

324. Local variants of a UBI are in place in a range of resource-dividend schemes. The Alaska Permanent Fund, for example, is designed to redistribute oil revenues to all residents. In 2016, the Fund distributed about US$2,000 each to 660,000 individuals. There are several small-scale schemes and experiments ongoing in Canada, China, Kenya, the Netherlands, and the United States.[251] While labelled as UBI, they are often versions of targeted programs.

325. The fiscal implications of a UBI could be significant. New analysis estimates the costs of providing a UBI in four European countries. UBI transfers were set equal to those of existing cash transfer programs.[252] Results show that the additional cost of a UBI varies significantly, i.e., 13.8 percent of GDP in Finland, 10.1 percent in France, 8.9 percent in the UK, and 3.3 percent in Italy. To cover the additional costs, two funding sources were identified: taxing UBI transfers alongside other incomes and abolishing existing tax allowances. In Finland and Italy, these measures were more than adequate to cover the extra costs of a UBI. In France, those revenues almost offset the cost of a UBI. In the United Kingdom, taxing cash benefits and eliminating tax allowances is not enough to cover for the UBI.

326. Simulations from developing countries also point to significant additional spending for a UBI. For example, in a handful of emerging economies a UBI set at 25 percent of median income would cost about 3.75 percent of GDP.[253] In comparison, low and middle-income countries spend on average 1.5 percent of GDP in social assistance. In India, the government's estimates show that a quasi-UBI excluding the top 25 percent could be largely paid by replacing existing schemes.[254] While the latter accounts for about 5 percent of GDP, results have been contested.[255] Other simulations are providing further evidence. For instance, 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. If transfer amounts are lower—for example, set at the average level of current benefits—costs would shrink considerably (but would have less impact). Whether a UBI is provided for an amount to close the poverty gap or being equivalent to current transfers, the cost of the scheme would nearly double if intended to the full population and not for adults only (figure 5.4).

Figure 5.4. Simulated cost of UBI for closing the poverty gap by country income group (percentage of GDP)



Source: Authors' calculations based on World Bank World Development Indicators, World Bank PovcalNet, and United Nations World Population Prospects.

327. A UBI would generate winners and losers among the population. Effects depend on how the program is financed; if and which programs would be replaced; the performance of existing schemes; current tax structures; the size of UBI transfers; and the profile of beneficiaries.

328. Estimates for select developing countries that simulate replacing some existing schemes with a UBI found significant distributional effects.[256] In Nepal, for instance, most individuals would experience gains from a UBI. In Indonesia, while a UBI providing the same average amount of benefits of current programs would make most of the population better off, about 40 percent of the poor would receive less benefits. Under the same scenario, simulations suggest that a UBI in South Africa makes most of the elderly and the poor worse off. A similar negative effect on about 40 percent of senior citizens would be observed in Chile.

329. A recurrent concern around UBI is the risk of work disincentives. In theory, a UBI only has an income effect: the fact that the program benefits are delinked from earnings or other income may suggest there is no substitution effect.[257] Available evidence confirms limited impact on work incentives. This holds for both UBI and other forms of social assistance.[258] A study on the Alaskan dividend program shows no impact on employment. Instead, it finds increases in part-time employment of 1.8 percentage points (or a 17 percent increase).[259] Yet, the size of the average transfers under the scheme is arguably too small to affect labor supply. Similarly, a study of the Iranian quasi-UBI program found that it did not affect overall labor supply.[260] There was a negative effect among young people, however. It has been argued that a UBI may empower individuals, both within households (e.g., 'making unpaid work pay') and in the labor market (e.g., the power to 'say no').[261] These emancipatory effects would likely require more generous benefit levels.

330. An important debate is whether a jobs-guarantee program would offer a better alternative to UBI. For example, India's National Rural Employment Guarantee Act offers 100 days of work every year at the minimum wage. UBI proponents contest public works on the basis that a "right

to income" should precede that of work. Conversely, it is contended that the right to work rests on the premise that anyone who wants work could be offered a job, hence placing work as a central societal value. Those favoring jobs schemes also point to the range of productive and socially valuable activities implementable beyond labor-intensive tasks (e.g., social care services). A UBI may be an alternative to public works when their overwhelming function is mere income support. However, when more meaningful activity is envisioned, public works emerge as a complementary instrument for those who are fit and able to work. The concept of 'participation income' is a hybrid between a UBI and public works. It envisions the provision of universal cash transfers tied to some form of civil engagement.[262]

331. As with other forms of social assistance, a UBI requires solid delivery systems. One requirement is a credible personal identification system. In Sub-Saharan Africa, the share of the population with national IDs ranges from nearly 90 percent in Rwanda to less than 10 percent in Nigeria. A UBI necessitates robust payment mechanisms and markets capable to meet additional demand from cash transfers. A UBI program would also call for carefully monitoring inflation, which was a major issue in the case of Iran. It would still need core delivery building blocks for social assistance, like outreach, registration, information systems, recertification, oversight, monitoring and evaluation, grievances and redressal mechanisms.

332. A UBI could generate efficiency gains by reducing program fragmentation. Most countries layer together social assistance programs in a complex mosaic. For example, Bangladesh has more than a hundred programs. India has nearly 950 centrally sponsored schemes, with many more provided at the state level. This plethora of programs usually has more historical or institutional roots than solid technical justification. Some degree of consolidation may be appropriate, but the optimal number of programs is certainly more than one. The program composition of social assistance should allow for differentiated support to different vulnerabilities; instead, as illustrated, a UBI offers flat benefits.

333. Poor and vulnerable households are undercovered in most low and middle-income countries. By **s**implifying eligibility, UBI may enhance their coverage significantly. This comes at the cost of explicitly including the better-off in the scheme. However, a universal approach is no guarantee to reach all those most in need. Also, some groups at the bottom of the distribution may not be better-off with a UBI instead of targeted programs. For instance, the net impact would depend on the level of progressivity of existing tax-benefit systems: where these are regressive, a flat benefit may yield distributional gains. Also, UBI demands identification and payment mechanisms at a larger scale than other options. When deemed appropriate, a UBI should be phased-in gradually, including building on similar cash transfer programs already in place. Broader coverage and additional efforts would require a much larger fiscal envelope. However, the wide reach of UBI programs may strengthen social contracts when social assistance and insurance leave many uncovered.

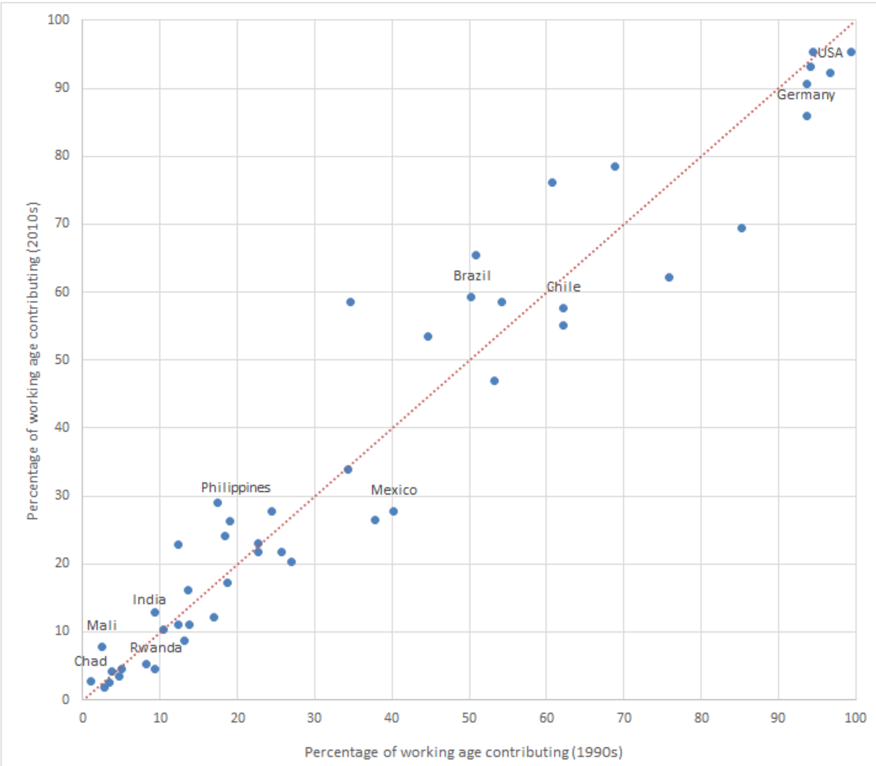
Social Insurance

334. After six years of double-digit growth, in June 2011 Ethiopia introduced a landmark social insurance law. For the first time, the mandate to provide pension and disability benefits was extended to private-sector firms. Firms operating beyond the reach of enforcement were able to evade and keep their workers uncovered. The policy aimed to expand social protection and reduce poverty. However, the consequent rise in labor costs, together with other factors, induced firms to adopt more technology. As a result, employment among lower-skilled workers dropped, exacerbating the formal-informal divide in the labor market.[263]

335. The advent of social insurance in Bismarck's Germany at the end of the 19th century marked a turning point in how society's dealt with the risks faced by the newly industrialized workforce. The concept of mandating contributions which were then used to provide benefits to those suffering accidents, ill health or other poverty-inducing risks was eventually adopted almost globally. The role of social insurance in the 'liberal' economies such as Canada and the United Kingdom was more limited, while in Scandinavia general revenue-financed programs (e.g., universal health insurance and social pensions) played a significant role. The 'continental' model of social insurance varied, but contribution-based social protection was clearly dominant in France, Germany, Italy and Spain.[264]

336. Today's Bismarckian social insurance model is premised on steady wage employment, clear definitions of employers and employees, as well as a fixed point of retirement. It relies on levying a dedicated tax on wages. In rich countries, this scheme was effective in increasing coverage as workers were steadily absorbed into factories, then onto jobs in formal services firms. This contributory approach is ill-fitting for developing countries where formal and stable employment is not common. Indeed, because eligibility is based on making mandatory contributions, this form of social insurance excludes informal workers, who account for more than two-thirds of workers in developing countries and one in ten in India and many countries in Sub-Saharan Africa (figure 5.5). This model is also increasingly unsuitable for a changing world of work where the prevalence of traditional employer-employee relationships is no longer the norm. The traditional financing model of social insurance can also make employing workers more expensive, as illustrated by the case of Ethiopia. Thus, rethinking this model is a priority.

Figure 5.5. Coverage of social insurance in developing countries is low and stagnant



Source: Authors' calculations based on World Bank pension database and World Development Indicators.

337. A reformed system needs to ensure that low-income workers have access to effective risk management tools. The right combination of instruments, subsidized for the poorest, is required to cover losses from livelihood disruptions, longevity, sickness, disability and untimely death. Instruments that support stable consumption patterns, or consumption smoothing, are also important. A comprehensive package of protection can meet these goals. This package would contain, first, a guaranteed minimum insurance with subsidized coverage against impoverishing losses. This instrument would complement social assistance by providing coverage against losses that would be too large to cover through transfers. Second, a mandated savings and insurance plan can smooth consumption. Finally, market-based nudged or purely voluntary savings would allow people to make additional savings, if desired. Elements of this model already exist in many countries.

338. This approach can, along with a guaranteed minimum income, reduce the size and pure-tax element of mandated contributions. To varying extents, current social insurance models mingle redistribution with risk-sharing functions, and thus require higher contributions which are perceived by many mainly as taxes on work. The extent of redistribution built into current social insurance schemes is low in countries like Indonesia or Vietnam, but is substantial in countries like China or the Philippines. Simulations suggest that a shift like the one proposed here could reduce the payroll tax rate in a country like the Philippines from 18 to 14 percent.[265]

339. Some countries are already moving in the direction proposed. The significant extension of the rural pension scheme in China is a case in point. Currently, around 360 million rural and urban

informal workers are contributing to the scheme. Around 150 million older people are receiving payments.[266] Similarly, Costa Rica's government covers part of the pension contribution for the self-employed. Thailand does the same for informal sector workers that choose to join a special pension scheme aimed at low income workers. Subsidies could be for everyone, just for the poor, or be gradually reduced as income grows. The latter is the case in Turkey's health insurance system. In addition to an almost universal old age pension, Thailand pays part of the social insurance premium for working-age people in the informal sector. The cost of the subsidy depends, of course, on the subsidy level as well as the population to be subsidized.

340. In richer countries and countries with mature social insurance systems, reducing the reliance on payroll taxes is difficult. Social insurance in rich countries is financed through payroll taxes. These systems—found also in Eastern Europe and parts of Latin America—are mature and the size of their pension and health liabilities are formidable obstacles to change. In Romania, for example, the implicit pension debt is about 175 percent of GDP. As a result, other taxes would have to be increased dramatically to make up the financing gap that would arise with lower labor taxes. Most of these countries already have high rates of value added tax.[267] Therefore, while they have largely halted pension increases, most of the advanced economies are counting (at least partly) on future benefit cuts to deal with their aging populations. In some countries, like Brazil, pension deficits are already financed from general revenues.

341. In many emerging economies, social insurance liabilities are more limited since coverage is low. In countries like Bangladesh, Namibia, Lao PDR, Somalia, and South Africa, pensions are not financed through labor taxes but from general revenues. In these cases, decoupling from payroll taxes may be feasible. A significant portion could be replaced with other taxes while broadening the coverage beyond those in contracted and regulated, standard employment relationships.

342. In sum, in richer countries it is difficult to move completely away from the contributory model based on dedicated payroll taxes. However, they seem to have prevented further liability increases through budget cuts and occasionally through earmarking other taxes.[268] Middle income countries may have more scope to replace part of their financing. Finally, the best chance for viable alternatives to payroll tax lies in low-income countries that have either not introduced it or where there is no significant liability. Here, relying on general taxation could lead to higher coverage rates for basic insurance with fewer labor market distortions. These are also countries that could use technology to leapfrog institutional developments through, for example, the use of mobile transactions as a base for consumption taxation.

343. Beyond the basic insurance level, additional policy support is likely to be required to achieve adequate protection. Additional mandated contributions would allow consumption smoothing, for which instruments are often missing in countries with underdeveloped capital and insurance markets. This layer would cover formal workers, but setting the level of insurance is not trivial since a higher mandate leads to higher labor taxes. In some countries, these taxes are already high, which can affect formal employment. The average payroll tax rate used to finance contributions is almost 23 percent in advanced economies.[269] It is also more than 20 percent in countries like China, Egypt or Peru. The mandate could be relaxed by reducing the tax rate or lowering the ceiling on earnings subject to mandatory savings.

344. To complement mandatory contributions, policy makers can try to make participation in savings or insurance schemes the lowest-effort, default option. Some measures include adding an "opt-in" default on business registration and income tax returns. These measures can lower transaction costs. Other approaches that rely on behavioural insights can be instructive. In Kenya, giving people a golden colored coin with numbers for each week to keep track of their weekly deposits doubled their savings rate.[270] Another form of nudging may include "commitment devices" through which, for example, people agree to incur a loss if they do not reach a savings goal. Technology vastly increases possible nudges. For example, it facilitates the defaulting of rounding from mobile money or credit card transactions into savings.

345. There are also larger, national efforts to nudge people—regardless of the way they work—to augment savings and insurance efforts. The "KiwiSaver" program in New Zealand, for instance, relies on automatic enrolment and offers a limited set of investment choices. The United Kingdom's National Employment Savings Trust operates similarly. In both programs, although people can withdraw, incentives dissuade people from doing so.

346. In countries that have mandatory savings, the mandate can be softened by allowing people to access a portion of their savings for certain life events. Participants can be allowed to "borrow" from their individual account. Interest can be set at higher-than-market rates to encourage quicker "repayment". Singapore grants workers access to their mandatory savings for specific purposes, such as housing and education. The dilemma for policy makers is to balance individuals' liquidity preference with their long-term consumption smoothing objective.

Labor Regulation

347. In many developing countries, labor regulations were adopted at the time of colonialism. Through Napoleonic conquest, French civil law was transplanted throughout Western Europe and the colonies in North and West Africa, Latin America, and parts of Asia. Repercussions are still felt in the 21st Century: French (and socialist) legal origin countries have significantly more stringent labor regulations than do common law countries, placing more restrictions on how employers and workers interact.[271]

348. The more restrictive approach to regulation is ill-fitting to many developing countries' labor markets as it assumes greater administrative and enforcement capacity than most governments have. Designed with industrial-era economies in mind and at a time of weak social protection systems, regulations can fail to protect most workers when informality is the norm and work is often out of reach of the authorities. Within formal work, regulation in most countries was written assuming most working people are in stable, full-time wage employment. In many developing countries, these types of jobs are an exception, mostly found in the public sector or among high-skilled workers.

349. Governments seek to ensure the labor market is safe, fair, and a place where people's skills and enterprise are rewarded. In pursuit of these objectives, labor policies –workplace safety requirements, statutory minimum wages, employment protection and the institutions for dialogue and negotiations between market actors- are important instruments in the policy makers' toolkit. Like any set of tools, their successful application requires balance, agility and close attention to their impact on market actors. Such balance is aimed at, for example, in the "flexicurity" model,

with its roots in Denmark in the late nineteenth century, combining flexibility in the labor market with strong social protections and active labor market programs. In this view, labor market flexibility and social protection are strong complements.

350. Reforms need to address three main challenges of labor market regulations. First, they cover few, only formal workers whose labor is observed by the state. Yet, more than half of the global labor force is informal. Especially in non-agricultural activities, close to seven in ten workers are informal or work on the informal sector in countries like Guatemala, India, Liberia and Pakistan.[272] Second, governments are trying to do too much with labor regulations, expecting these to substitute for a social protection system, including ensuring a minimum income or substituting for unemployment benefits.

351. Third, and as argued in the World Development Report 2013, while they address labor market imperfections, they can also reduce dynamism in the economy, by affecting labor market flows and increasing durations in both employment and unemployment.[273] Importantly at this time of change, stringent regulations make it costlier for firms to adjust the composition of their workforce, an important condition for adopting new technologies and increasing productivity.[274] This happens especially when regulations are too strict as they can impose a high cost on firms as well as on society by excluding many, especially youth and the low-skilled.

352. Labor regulations set necessary rules—including core labor standards. When absent or set at inadequate levels, working people are left vulnerable in the face of growing employer market power, particularly in settings with weak governance. Regulations can also encourage firms to invest in training or can increase workers' commitment to their jobs.

353. However, when too restrictive, regulations impose costs on firms that can hamper dynamism.[275] In a sample of 60 countries, moving from the 20th to the 80th percentile in job security, in countries with strong rule of law, cuts the speed of adjustment to shocks in terms of employment by a third and reduces annual productivity growth by one percentage point.[276] Productivity-enhancing technology adoption is negatively associated with the strictness of some labor regulations, specifically with burdensome dismissal procedures.[277] Technology-intensive sectors are smaller in countries with stricter employment protection regulations.[278] More stringent regulations are also associated with lower entry and exit of firms—especially small ones—in industries with higher worker reallocation.[279] Within countries, similar evidence is also emerging.[280]

354. The challenge is, thus, to establish the right balance between workers' protection—including protections for those without a labor contract— and firms' flexibility in the management of their human resources. This balancing act calls for avoiding too stringent regulations that stifle dynamism as well as too lax regulations that leave vulnerable workers without fundamental protections.[281]The tensions are clear in efforts to introduce more flexible contracts in advanced economies, such as "mini-jobs" contracts in Germany, or zero-hours contracts in the United Kingdom. Such contracts segment the labor market and create distortions. Regulations should inform the choices and improve the matches between employers and workers, but not be a leading determinant of those choices or their outcomes.

355. To address these problems, policymakers need to rethink labor regulations. Some countries are reforming labor regulations in ways that support firms and workers in adapting to the changing world of work. Italy's recent reforms, for example, have been associated with the creation of more permanent jobs.[282] The flexicurity objective remains vital. Many governments have made their labor markets more flexible. However, only a few are making corresponding investments in income support and reemployment assistance to get workers back into work. Reforms can provide firms more flexibility while strengthening social protection, intermediation and job-search assistance programs and arrangements for expanding workers' voice. Beyond basic regulations, protections would be provided to all working people irrespective of contracting type, and as part of a comprehensive approach to social protection and labor institutions. This approach adds protection to the many workers—often the most vulnerable—who are effectively excluded. Thus, this would be a shift from protecting some jobs to protecting all people.

356. One of the policies that needs careful attention is the statutory minimum wage. Only a minority of workers benefit from the minimum wage; most informal workers do not.[283] Even in correcting imbalances in market power, a legislated minimum wage is blunt, as it assumes that these imbalances are the same across the board and it is not responsive to changes in market power. In most cases, the minimum wage applies uniformly to firms irrespective of productivity, across regions and sectors. As a result, many firms—65 percent of formal firms and 82 percent of informal ones in Paraguay, for example—have labor productivity levels that are below the minimum wage.[284] Hence, it is important to link minimum wages to labor productivity.[285]

357. The bargaining power of workers also needs to be strengthened. Labor unions—particularly those making efforts to broader their constituency and membership to traditionally underrepresented segments of the labor force—play an important role. So does collective bargaining. Technology, including social media, can make this task for workers associations more effective. For larger firms, for whom there is evidence in advanced economies of increased labor market power, increased scrutiny could be applied to competition policies and assessments of the potential adverse labor market effects of mergers.[286]

358. A more ambitious set of instruments would target, explicitly, the distribution of value added within the firm. Many workers, such as sole traders, self-employed or workers in family businesses, are sharing in the profits of firms. Profit sharing—monitored by social partners and firm-level collective bargaining arrangements—can be an attractive complement to the minimum wage. The experience of the more than 50 countries that have mechanisms for profit sharing can be illustrative. The proceeds from the profit sharing could be deposited into an individual savings account.

359. Although reasonable notice periods and protections against discriminatory dismissals are important to counter employer market power, when rules on firms' hiring and dismissal decisions are too onerous, they can also create structural rigidities that carry higher social costs in the face of disruption. Bolivia, Oman and Venezuela, for example, do not allow contract termination for economic reasons, limiting grounds for dismissal to disciplinary and personal reasons. In 32 countries, the employer needs approval of a third party even in cases of individual redundancies. In Indonesia, an approval from the Industrial Relations Dispute Settlement Board is required; in Mexico, the employer obtains approval from the Conciliation and Arbitration Labor Board; in Sri

Lanka, the employer must obtain consent of the employee or approval of the Commissioner of Labor.

360. Firms could be accorded more flexibility in managing their human resources contingent on the law mandating proper advance notice, the presence of an adequate system of income protection as well as efficient mechanisms to sanction discrimination. More flexible dismissal procedures when current regulations are stringent ought to be balanced with increased protections outside of the work contract and active re-employment support measures to meet the needs of people who lose their jobs. Otherwise, reducing restrictions on hiring and dismissal decisions would shift an unmanageable risk-burden onto workers. The current approach in many countries, however, places too much of this burden on firms and not enough on the state directly. To prevent abuse, ministries of labor can implement audits based on the risk of violating the law and apply penalties on employers found at fault.

361. The provision of financial protection to workers in the case of livelihood disruptions can also be reformed. Severance pay is the most prevalent form of this protection in most low and middle-income economies. However, it is left over from a time when governments were unable to offer unemployment income support schemes. Some countries have, on paper, extremely generous severance pay. For example, after ten years of continuous employment, the statutory severance pay equals 132 weeks of salary in Sierra Leone, 130 weeks of salary in Mauritius, and 120 weeks of salary in Bahrain.

362. Yet, severance pay is an ineffective instrument for income protection since it pools risk at the firm or industry level where shocks and losses can be correlated.[287] In addition, employees face a high risk of not receiving payments if their employers have liquidity constraints or go out of business. Placing greater reliance on unemployment benefits organized nationally would give workers more reliable options. National, rather than firm-based arrangements also open this form of protection to all, no matter where or how they work. To ensure sufficient protection while preserving work incentives, unemployment benefit systems would rely both on individual savings and redistribution.[288]

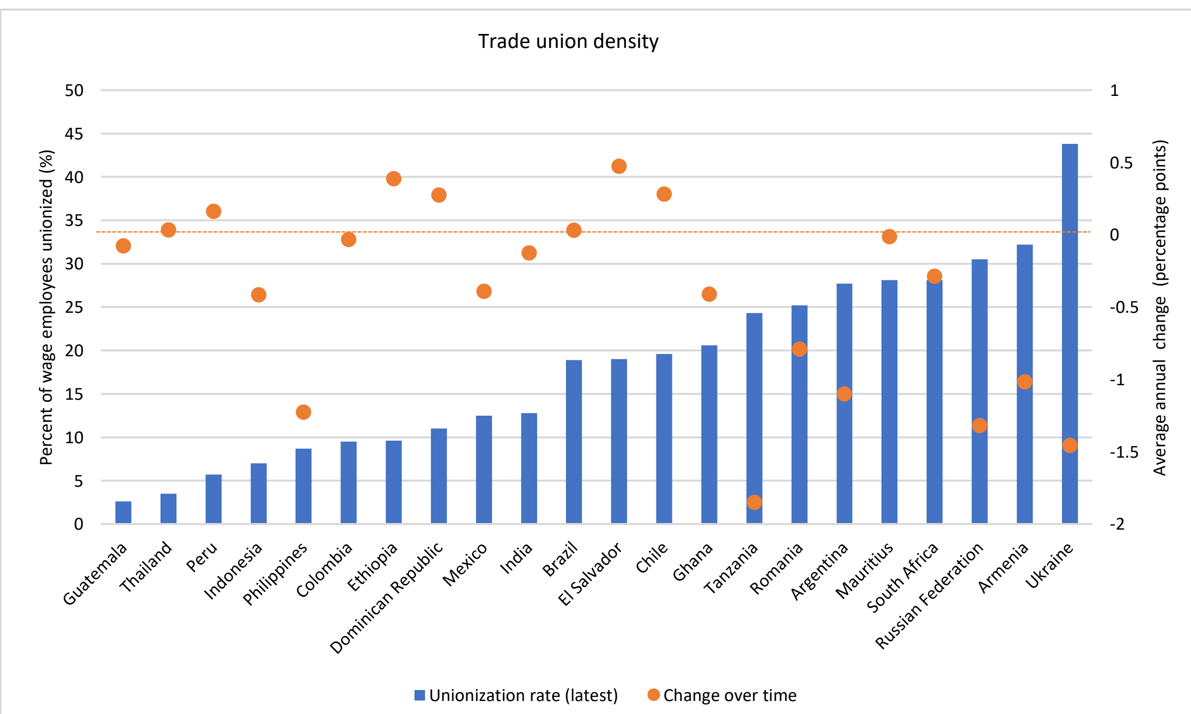
363. Savings could be drawn upon in case of unemployment or for retraining. If people do not draw on all their savings, the remainder would be available upon retirement. Workers without enough savings would be able to rely on the minimum income guarantee financed through general revenues. Chile and Jordan, for example, have individual savings accounts for unemployment. Singapore has individual accounts that can be used for unemployment, housing or education.

364. Governments would need to ensure that worker protections in the labor code are neutral with respect to working forms. Brazil's 2017 labor code reform moved in this direction. Any benefits that are part of the base contract would also be pro-rated depending on hours worked. A starting point is to do away with regulations that severely constrain flexible work arrangements. In Montenegro, for example, contracts for part-time employment cannot be less than 10 hours each week. In Serbia, the "reference" wage (determining a minimum social contribution) is not adjusted for hours worked.[289] Reforms are also necessary in terms of working time arrangements. The traditional 5-day, 8 hours a day work week is no longer desirable for some workers.

365. As the industrial-era employment protections are scrutinized, so too need to be rigid, possibly outdated laws regarding work arrangements. Some new forms of work blur the distinction between being an employee and being a “dependent” self-employed: is a Yandex driver a Yandex employee? Labor codes need to define more clearly what it means to be an employee in current labor markets to ensure the basic set of protections discussed above. This definition would be based, for example, on the extent to which the worker determined her working conditions (e.g. when to work). Generally, it is important to ensure convergence in the types of benefits and protections that workers receive, regardless of the length of time they spend with a given employer.

366. Finally, there is also a need to strengthen the enforcement of labor laws and mechanisms to expand workers’ voice. Unions and collective bargaining institutions remain important, especially at the level of the firm and given potential unequal changes in information and power. Moving to a simpler, core contract would also require strengthened collective bargaining structures as fewer protections are pre-specified in the law. But their significance is declining: across high-income countries, on average, the share of workers covered by a collective agreement has shrunk from 37 percent in 2000 to 32 percent in 2015; 24 percent of employees are members of trade unions, down from 30 percent in 1985. In developing countries, given high informality, unions and collective bargaining tend to play a more limited role (figure 5.6). Unionization rates vary from between 15 and 20 percent of workers in Brazil, Moldova, Senegal, or Tunisia to less than 10 percent of workers in countries like Ethiopia, Guatemala, Indonesia or Turkey. Countries like South Africa, where almost 30 percent of workers are estimated to be unionized and a similar share is covered by collective bargaining agreements, are an exception.

Figure 5.6. Rates of unionization are low and declining in many developing countries



Source: Authors’ calculations, based on ILOSTAT.

367. These institutions need to be updated to remain relevant, reflecting the diversity of working forms and giving much needed voice to old and new actors in the world of work. Including self-employed and informal firms in the social dialogue, for example, would more accurately reflect the range of actors relevant for the future (and present) world of work. This is being done in some cases: for example, In New York, the International Association of Machinists and Aerospace Workers (IAM) are allied with the Independent Drivers Guild (IDG) representing over 60,000 drivers. In short, countries need to build more representative structures to expand representation at the dialogue table beyond the traditional 'tri-partite' model. This model works well within the context of a firm, but less so at the national level where other groups with divergent interests exist. In some developing countries, such as Kenya or Uganda, the informal sector is organized and represented in many national discussions. India's Self-Employed Women's Association (SEWA) represents self-employed workers.

368. Digital technologies strengthen voice. Digital technologies improve systems which rely heavily on labor inspectors. They also bring down enforcement costs by more cheaply monitoring compliance with laws. In Brazil, the Annual Social Information report is used to monitor compliance with the Apprentice Law. Oman has a Worker Protection Scheme that allows for monitoring wage payments. Social media plays a role in voicing complaints about employers and working conditions, putting pressure on authorities but also on employers due to reputational risks. In addition, governments could, through results-based contracts, outsource to third-parties the development of online platforms for submitting, managing and resolving labor complaints.

369. Given the changing nature of work, as well as the need to improve workers' productivity, especially among the poor and informal workers, active labor market programs become an even more vital instrument in policymakers' toolkit. Governments need to ensure that first time job-seekers, workers who lose their jobs, or those who are working on low-productivity jobs have access to proper counseling, training, information about new job opportunities, job-search assistance, and migration support. However, most low and middle-income countries spend little on active labor measures: about 0.5 percent of GDP. Only a fraction of the unemployed and inactive population has access to these services, particularly in rural areas.

370. Beyond the expansion of these support programs, it is important to get these interventions right. Many programs have a poor track record. For instance, among 90 youth employment programs that were rigorously evaluated only 30 percent had a positive impact on employment rates or earnings and the effect was small.[290] While impacts tend to be small in the short-run, these often increase with time as workers raise productivity or are absorbed in the labor market. A recent analysis of these programs also found that programs that emphasize human capital accumulation are particularly promising. So are also programs that focus on women or the long-term unemployed.[291] In judging their effectiveness, however, it is important to keep in mind what these programs can be reasonably expected to achieve, especially as they often target low-skilled workers in environments of limited labor demand.

371. Hence, there are two challenges that governments face regarding active labor market programs: increasing scale and improving the approach. There are emerging lessons from a range of successful programs that address these challenges. First, the importance of tailoring programs to the specific needs of individuals, recognizing that typical target groups of such interventions—such as youths or women—are far from homogenous. Second, countries need to consider moving

from ad-hoc, self-standing, interventions, to an integrated package of services that can be adapted to needs. For example, the evidence suggests that in-classroom technical training for youths is more effective if combined with work experience in the form of internships or apprenticeships and socio-emotional skills.[292] Several of the youth employment programs in Latin America and the Caribbean, and similar initiatives in Sub-Saharan Africa, follow this model.

Chapter 6: The Changing Nature of Firms

372. Firms have, historically, operated within boundaries. The British economist Ronald Coase explained this phenomenon in *The Nature of the Firm*.[293] He observed that firms in Detroit, USA, grow only so long as it is cheaper for them to take on additional transactions rather than it is to complete those transactions on the open market.

373. Firms in 2018 operate within wider boundaries. Free trade agreements as well as improved infrastructure reduce the cost of cross-border trade. This allows transactions to take place wherever costs are minimized.[294] New technologies have lowered communication costs. As a result, firms are also less vertically-integrated: managers can outsource more tasks to the market. Some platform companies create new markets, for example JD.com in China has nearly 300 million active users.

374. The wider boundaries of the firm evolved gradually. Compare the Ford Motor Company (Ford) of the 1930s with Inter IKEA Group (IKEA) of 2018. Henry Ford owned the sheep farms that supplied the wool for automobile seat covers. He also owned the iron ore and coal freighters that fed Ford's sprawling River Rouge manufacturing complex. Ford kept most of the transactions needed to manufacture a car in-house because the transaction costs were higher for finding an outside supplier able to customize auto parts.

375. Vertical integration within one country gave ground to globalization in the 1980s and 1990s. The international expansion of IKEA, founded in Sweden in 1943, began with the establishment of small stores in Norway in 1963, then in Denmark in 1969.[295] The reduction in tariff or non-tariff barriers allowed IKEA to set up global value chains. The advent of internet technology transformed these chains into global networks: IKEA procures many of its products through online bidding. Firms from around the world become part of IKEA's network of suppliers.

376. The rise of "superstar" firms like IKEA would have made Joseph Schumpeter proud. "Capitalism requires the perennial gale of Creative Destruction," Schumpeter wrote.[296] He did not worry about whether jobs might be lost in the process. Politicians do.

377. Thanks to digital technologies, which allow for rapid scaling, platform-based businesses are on the rise across the globe. Jamalon, an eight-year-old online books retailer in Amman, Jordan, was able, with less than 100 staff, to establish partnerships with over 3,000 Arabic-language and 27,000 English-language publishers, delivering 10 million titles to the Middle East region.[297]

378. Around the world the corporate labor share declined between 1975 and 2012 in 75 percent of advanced countries and 59 percent of emerging economies.[298] World Bank evidence based on the use of total labor shares, including the self-employed and government sectors, shows a decline in two-thirds of the 76 developing countries.

379. Governments struggle to respond to this decline and often blame the rise of superstar firms to explain this trend. Politicians try to create jobs by financing programs for the development of small and medium enterprises (SMEs). These programs are rarely cost-effective. They are based

on the belief that SMEs create stable jobs. Yet the evidence shows that large firms account for the largest proportion of stable jobs in many economies.[299]

380. A better solution is to ease the barriers for start-ups to foster competitive markets and create more productive firms. Start-ups require a business-friendly environment which does not favor large private firms that have been already in a market for some time (incumbents), state-owned enterprises or firms run by government officials, their associates or relatives. A small number of start-ups will grow to become the next superstar firms. Technological change favors the most productive firms in each industry, incentivizing the reallocation of resources towards them.

381. There is much to celebrate when it comes to the rise of superstars. But there is also much to beware. Start-ups can grow faster in the digital age compared with firms of 20 years ago. But negative externalities can arise faster in two ways. First, firms can more easily stifle competition in digital markets. Sherwin Rosen, who introduced the concept of superstar firms in 1981, predicted that technology would allow firms to expand markets or crowd out the competition more easily. In many markets, this prediction has proven to be true. Technology has allowed some companies to rise quickly to the top—but prevent others from rising.

382. Second, firms can more easily undermine fiscal policy. The cross-border supply of goods and services in the digital economy is difficult to tax under current rules. Solutions require coordination at the global level. Some countries are taking unilateral steps by extending VAT to goods and services sold via the internet. But these taxes have a direct impact on consumer prices. They still do not tax profits generated through intangible assets, such as user data or advertising space. More traditional tax avoidance schemes, through transfer pricing, are also easier in the digital economy.

383. Regulations, particularly in relation to competition and taxation, must be updated if they are to keep up with technological innovation.

The New Superstar Firms

384. Thomas Jefferson raised concerns around the “aristocracy of corporations” when he announced in 1816 that “I hope we shall crush…in its birth the aristocracy of our monied corporations, which dare already to challenge our government…”.[300] A century later Theodore Roosevelt warned that corporate giants dominated the American economy. Another century has passed, and those words are still applicable. The nature of these superstar firms has changed tremendously, however.

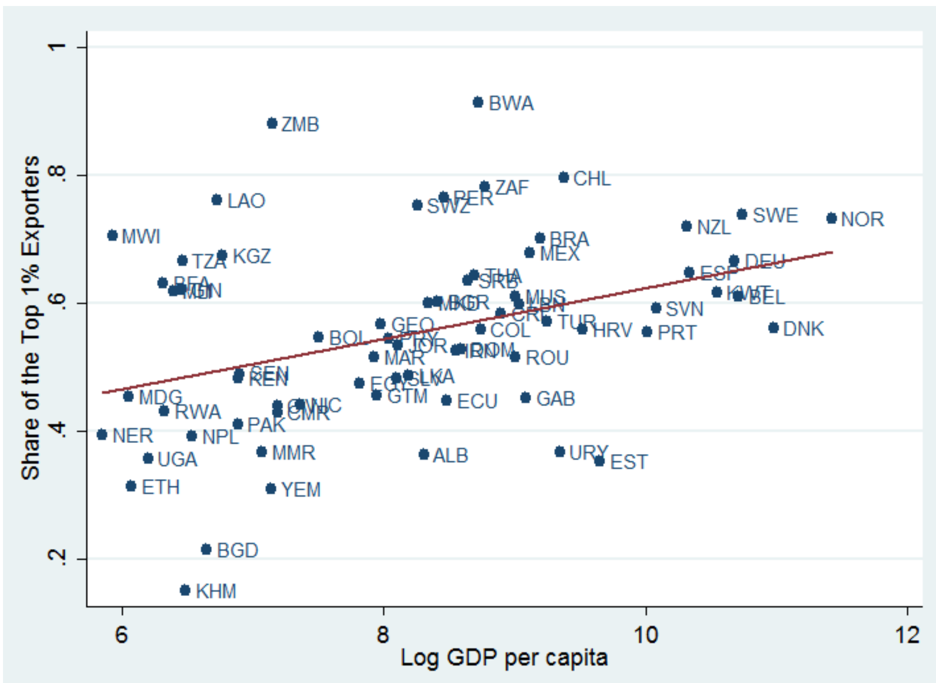
385. Natura Cosmetics S.A., the largest cosmetics maker in Latin America, was founded in 1969 as a door-to-door business in Brazil. Natura distinguishes itself via its direct sales model, as well as its environmentally-sustainable business practices. In 2018, it was selling personal care products in more than 3,200 stores in 70 countries across the world, with RUS$9.85 billion (US$3 billion) in net revenue last year. It employs 7,000 staff and operates a network of 1.4 million sales consultants globally. Natura’s online sales are growing fastest, up by 400 percent in 2017 alone.

386. This is just one example of large, innovative (*superstar*) firms that dominate the global economy: 10 percent of the world’s public companies generate 80 percent of all profits. Emerging markets account for a growing proportion of these profits. Superstar firms shape a country’s

exports. One study across 32 developing countries found that, on average, the five largest exporters in a country account for one third of exports, nearly half of export growth and a third of growth due to export diversification.[301]

387. Superstar growth is particularly strong in markets undergoing rapid technological advances.[302] Reduced trade barriers also encourage firm growth by increasing access to new imported inputs.[303] The top one percent of exporters account for a larger share of exports—on average, 55 percent (figure 6.1). Reduced informational costs related to price search, free trade agreements, as well as improved infrastructure have reduced the cost of cross-border trade, allowing more transactions to take place.[304] The effect of trade on work is the subject of the next World Development Report.

Figure 6.1. The top 1 percent of exporters account for a larger proportion of exports in rich countries



Source: Authors' calculations based on Exporter Dynamics Database version 2.0 described Fernandes, Freund and Pierola (2016).
Note: Oil exports (hydrocarbons such as oil, petroleum, natural gas, coal etc.) are excluded from the calculation.

388. Large and innovative firms have a beneficial effect on economic growth. The largest firms can accelerate growth in developing economies by pulling resources out of subsistence agriculture. They increase aggregate productivity by upgrading their internal capabilities to become more efficient and drive out unproductive firms. They can achieve economies of scale that lower prices for consumers - although the benefits are not always passed through to consumers.[305] They often pay higher wages - although in some advanced economies evidence indicates that the large-firm wage premium has been shrinking.

389. These firms are at the forefront of adopting new technologies. The Kuka Group, founded 1898 in Germany, is a major supplier of robot technology, plant and systems to auto manufacturers,

allowing them to stream operating data for automated processing and human viewing. The data collected through sensors and actuators can be used to optimize operations and maintenance. Tech giants are changing many industries for the better by disrupting them. Didi Chuxing, the leading ride-hailing company in China, has more than 450 million users of its app. Customers prefer the service over the established taxi sector, forcing it to improve.

390. The largest firms account for the majority of formal jobs in an economy.[306] Firms with more than 100 employees accounted for 60 percent of the total employment share in Malaysia, Myanmar and Vietnam. In Cambodia in 2016 they accounted for 70 percent. This plays out in other regions too: large firms accounted for 53 percent of total employment in Argentina; 46 percent in Bolivia; 54 percent in Ecuador; and 62 percent in the Dominican Republic. In Serbia, workers in the top one percent of manufacturing firms hold a quarter of total employment; the top five percent absorb almost half of the total labor force. Romania presents a similar picture. Superstar firms tend to employ the most workers because they generate the most output, even if they are less labor-intensive than the average small or medium-sized firm.[307]

391. They are also large integrators of young, innovative, dynamic firms. Superstars assist small businesses by connecting them with new markets to source inputs, offering convenient payment solutions, and reaching a wider, targeted consumer base. In India, numerous technological startups act as digital partners for global technological companies, providing payment solutions and app development services at a lower cost compared with large firms' in-house capacity. These startups are the largest employers of India's contract workforce.

392. The importance of large firms in driving economic growth is not new. However, the advent of digital platforms changes how this phenomenon unfolds. Digital platforms are the new bricks-and-mortar malls, connecting shoppers with different brand stores, creating efficiencies for brands, and generating revenue for mall owners. But data gathered through platforms can also be utilized to improve firm efficiency. Ant Financial, an independent financial company which is part of the Alibaba Group, incorporates transaction data into its loan assessment model that it gains through Alibaba's Taobao marketplace in order to offer microcredit to merchants on the same platform.[308] VoaComer in Honduras developed a platform for users to search for restaurants based on recommendations and rate their own experiences, thereby improving the culinary experience of visitors and locals.

393. The list of the world's most valuable firms by market capitalization in 2017 reveals that firms increasingly leverage online platforms to improve their offerings to customers. Seven of the top ten non-financial firms on the list fit this category. Digital giants, such as the Alibaba Group in China, entered the Global Fortune 500 within less than two decades. Much of Alibaba's growth was driven by Taobao, its e-commerce platform.

394. Amazon and other global players still dominate this list but platform-based businesses are on the rise in every country. Consider VIPKID, a leading Chinese online education firm, founded in 2013, that matches children in China with North American teachers for virtual, one-to-one English learning classes. It links 200,000 students with 30,000 teachers in North America. Jumia is a six-years-old Nigerian e-commerce company that is already present across 23 African countries, bringing electronics, groceries, and fashion to customers. Flipkart in India facilitates

sales of consumer electronics between suppliers and customers. Flipkart operates like a market, defying the boundaries of firms as originally described by Ronald Coase.

395. Digital platforms allow for rapid scaling. There are many examples of billion-dollar startups built around them. JD.com, China's second-largest e-commerce company, started as a retail business in a tiny booth in Zhongguancun Electronic Shopping Market, Beijing. In April 2018 the JD platform had 300 million active users. Ant Financial is the most valuable fintech firm in the world. It took off within just a few years due to advances in artificial intelligence. It uses big data to disburse loans in less than 1 second from the moment of application. Its famous "3-1-0" online lending model involves a 3-minute application process, 1-second processing time, with zero manual intervention. Since 2014 more than four million small Chinese businesses received loans.

396. Digital platforms create instant business opportunities for entrepreneurs who otherwise might spend a long time developing a sales force and international presence. Since 2009 many clusters of rural micro e-tailers have opened shops on Taobao.com Marketplace, fostering "Taobao Villages" in China.[309] Taobao Village merchants produce consumer goods, agricultural products and handicraft works based on their niche competencies. Taobao Villages has created more than 1.3 million jobs, drawing young people who migrated to cities back to their hometowns to start their own enterprises. Reliable internet connectivity and high smartphone penetration must exist for this kind of e-commerce to grow.[310]

397. Platforms expand the business opportunities for service providers which can consolidate services sectors and create more jobs. In 2018, the services sector accounts for the majority of jobs in many countries: its share in total employment is more than 70 percent in Argentina, Saudi Arabia, Uruguay and above 80 percent in Jordan, Israel and Hong Kong SAR, China. There has been a proliferation of platforms that allow freelancers to have simultaneous access to multiple platforms at low entry costs. Consumers are also more willing to use online services because they trust them as a result of brand certification, digitalized social capital and third-party validations. Consumer trust enables platforms to expand rapidly into other business lines. Grab, a Singapore-based ride-hailing platform, grew to hold 95 percent of the Southeast Asian market before expanding to offer additional services ranging from ordering food to payment systems at the touch of the app. GrabPay addresses a critical gap in this region where an estimated two-thirds of people do not have bank accounts.

398. Some platforms expand the supply of labor by increasing opportunities for new, flexible types of work that can complement traditional forms of employment in the gig economy. Data from Germany indicates that only 0.8 percent of the labor force is active in it. The global freelancer population is estimated at around 84 million—less than 3 percent of the labor force (3.5 billion).[311] Workers set their own hours for most platforms, which operate around the clock. The additional source of income can reduce income fluctuations for secondary earners. The flexibility inherent in platform work also enables more women to participate in the labor force. But these features blur the line between formal and casual employment. While flexibility is a benefit in some cases, it also raises concerns around stagnant wages, income instability, and protections connected with standard employer-employee relationships, including pension plans, health insurance and paid leave.

399. Finally, digital platforms enable firms to exploit under-used physical and human capacity—transforming dead capital into active. Hernando de Soto in *The Mystery of Capital* explained that capital is created when an asset's economic potential is fixed into a form that can initiate production. Assets that are not fixed in a formal property system are difficult to mobilize in markets: "[t]he formal property system […] is the place where capital is born." Property records capture and organize the necessary information required to conceptualize the potential value of an asset, identifying, exploring and combining those assets. Digital platforms do the same. Ride-hailing platforms provide a way for individuals to advertise their free time and spare vehicle capacity—be it a luxury vehicle, a moped, or a tuk-tuk—to generate income. Freelancing websites enable unemployed computer programmers located in remote parts of the world to document their expertise to find remote work with companies abroad.

400. The rise of the digital platform firm—operating globally, existing principally in the cloud and often generating income from the capital of others—marks a shift in the nature of firms more generally. Most regulations are not yet adapted to these changes. Platform firms often operate in regulatory grey areas, but minimum standards of quality, prudence and safety, among other policy goals, must still be upheld by digital business. Data privacy and protection is at the center of the regulatory discussion considering the large amount of data accumulated, employed, and monetized by platform businesses. Zoning or other laws affecting business activity may also be implicated. For example, although Airbnb can shift tourism away from urban centers and have a positive impact on local businesses, Airbnb locations are often not subject to the same zoning or licensing requirements as other commercial accommodation. Nevertheless, Airbnb can affect neighbors who do not share the benefit of local rental income.

401. Regulators can adjust laws to ensure their relevance to the new business models platforms create, without obstructing growth or the disruptive potential of new platform businesses. For example, Airbnb is working with destinations such as Denmark, as well as the cities of Amsterdam, Barcelona, Milan, and New York, to develop models for improved capture of taxation and limitations on the types of dwellings, locations and duration properties can be rented using Airbnb. Peru's financial regulator has set up a special license that imposes a lighter regulatory burden for e-lenders. Mexico City created a new transport category for ride-sharing apps. Platform rating tools can also help.

402. Regulation may also be needed if platforms provoke a race to the bottom in price or working conditions. In Indonesia, drivers with Go-Jek and Grab held large demonstrations in early 2018 demanding an increase in their tariffs. Instead of banning the platforms, the Indonesian government is amending its laws to require such firms to register as transport companies, comply with safety requirements, and impose a minimum floor price. In early 2018, Egyptian courts suspended the licenses of ride-hailing companies Uber and Careem, in response to a challenge by taxi drivers. Shortly thereafter, in May 2018, the Egyptian government passed a law to regulate ride-hailing companies, allowing Uber and Careem to get back on the road and compete alongside traditional taxis.

403. Other governments have opted instead to ban platforms completely. For example, Bulgaria's Supreme Court ordered Uber to stop operating in 2016. The same year, the Hungarian government amended its regulations to make it effectively impossible for Uber to operate. Many other cities or countries have banned ride-hailing apps, including parts of Australia, China, Greece,

Slovakia, and Spain. It is yet to be seen which measures result in better medium-term outcomes for consumers.

Competitive Markets

404. Reducing trade barriers extends global value chains. The importance to doing business of a physical presence in a market is declining, particularly in the digital economy where intangible products are replicable at little or no cost. Expanded boundaries create opportunities for firms to grow, but in many cases the risk of market concentration increases. Anti-competitive behavior is harder to identify in the digital economy. Network effects can lead to significant benefits for early adopters, facilitating the emergence of monopolies.

405. Governments have an important role to play in ensuring that markets remain competitive—to promote the efficient use of resources while protecting the economic freedom of market participants. Competitive markets require government policies that strike the right balance between ensuring a level playing field in which firms can flourish while also patrolling anti-competitive behavior. Smart business regulation, investment in infrastructure and training, reduced barriers to export and effective competition policy enable entrepreneurs to create firms that compete and grow.

406. More start-ups means more competition.[312] If the business conditions are right, it is more likely that some start-ups will grow strongly, creating jobs. Faced with new competition, less productive firms—so long as they are not state-owned or politically connected—exit the market.[313]

407. Creating a better business environment allows more successful firms to rise naturally.[314] The World Bank's Doing Business project lays out the basic regulatory requirements for private initiatives to grow. These data have been used by researchers to study the deleterious effects of burdensome regulation. Poverty is lower in countries that have business-friendly regulations.[315]

408. A country with a business-friendly environment has more start-up activity and job creation.[316] When Mexico simplified business registration the number of new businesses increased by five percent and wage employment went up by 2.2 percent.[317] The failure of small firms to become larger lowered productivity growth in manufacturing by 25 percent in Mexico and India, compared with the United States.[318] Higher start-up costs can also result in lower overall productivity: in the absence of competition, firms that are already in a market will continue to operate regardless of productivity levels.[319]

409. Competitive markets require basic infrastructure. Roads, bridges, ports, and airports are required to trade goods efficiently. Lower transport costs, as well as streamlined, cheaper border compliance processes, increase exports.[320] Logistics infrastructure helps online trade in non-digital products. The Chinese government invested $300 million in 200 counties to establish local logistics centers to encourage rural e-commerce.

410. Broadband access is a prerequisite now that many firms exist in part or even exclusively on the internet. Mobile technologies can drive down transaction costs in remotely located markets that lack transport infrastructure.

411. Firms that embrace technology grow and compete in global digital markets. There are more entrepreneurs in digitally advanced countries.[321] The spread of SIM cards across Kenya to 90 percent of the population was vital to the success of M-Pesa, a mobile payment platform. Many attribute Kenya's start-up boom to M-Pesa, which enables entrepreneurs to access micro-credit and encouraged traditional banks to innovate.

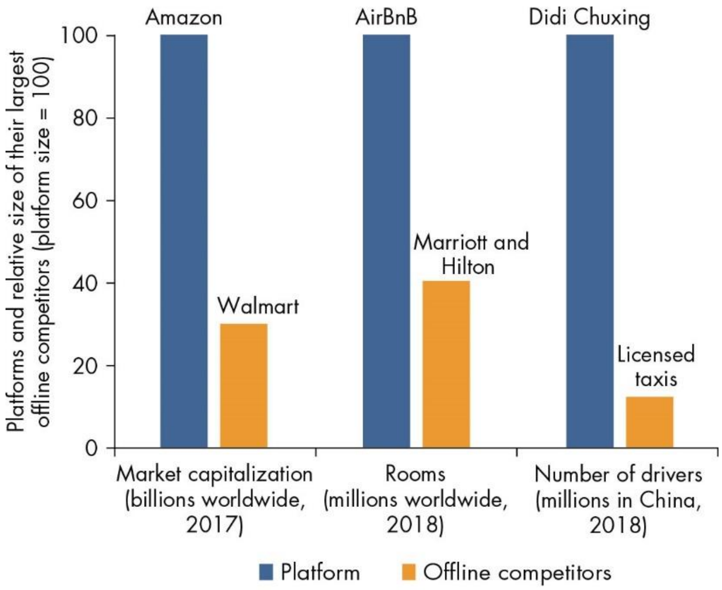
412. Technology allows firms to sharpen their competitive edge by making their operations more efficient and enabling them to create new ways of doing business. Teleroute is a Belgian platform that uses an algorithm to match freight-forwarders and carriers in Europe, reducing empty runs by up to 25 percent. Improved connectivity also enables start-ups to source essential technical expertise through online freelancing platforms. Upwork, a US platform, has, since 2015, connected five million businesses with more than 12 million freelancers. Its fourth largest community of task providers is in Ukraine. Start-ups used to need data centers, IT systems, custom software and a user support infrastructure to take on large conglomerates. Now entrepreneurs worldwide can source these services via the internet.

413. Governments can also improve market competition by helping firms to export. Firms participating in international markets are exposed to more intense competition and are more productive than firms which do not.[322] Trade fairs link smaller firms to larger exporters. National branding initiatives or indications of origin, such as "Made in Morocco" or "Lübecker Marzipan" can also give products a competitive edge in domestic and foreign markets.

414. While governments foster competitive markets by creating the right conditions for business, they must monitor markets for anti-competitive behavior. The largest, most productive firms in an economy may ultimately dominate domestic, regional, or global markets, in one or many sectors. New problems may arise over time as they become entrenched themselves.

415. The digital economy poses new challenges for competition law, mergers and acquisitions and consumer welfare. The rapid ascent of platform firms raises issues related to market power (figure 6.2). The network effects associated with some online products often lead to significant benefits for early adopters, resulting in market concentration and facilitating the emergence of monopolies. In 2017 Safaricom, Kenya's largest mobile phone operator with 80 percent of the market, launched M-Pesa, the country's first mobile money system. A year later M-Pesa commanded the same market share in mobile money.[323]

Figure 6.2. Platforms vs. their offline competitors



Source: Authors' calculations, based on data from NASDAQ, AirBnb, Marriot International Inc., Financial Times.

416. Platforms can also exclude competitors by charging higher fees for other networks to interconnect. When Zimbabwe mandated interoperability and infrastructure sharing among e-money operators, it raised the number of subscribers by 15 percent. In Peru, the telecom regulator forced the largest communication networks to offer messaging services to banks that were expanding into e-money.

417. Superstars often rise through mergers and acquisitions. Indian Sun Pharmaceutical Industries became one of the world's largest generics companies because of a series of acquisitions it began to make in the 1990s. In 2017, Indonesia's biggest ride-hailing service Go Jek set out plans to acquire three local financial technology companies which would make it the country's dominant player in the nascent digital payments market.[324]

418. The digital economy poses challenges for policymakers. Many digital platform companies operate in adjacent, multi-sided markets, bundling or at least connecting different types of services. New types of market power emerge when firms provide services free of charge on one side of the market in exchange for user data, then monetize that data on another side of the market. Most competition rules are not yet built for these situations.[325] Governments are adapting rules to deal with adjacent markets. Google received a US$2.7 billion fine from the European Commission in 2017 for abuse of market dominance when it promoted its own shopping services in search results at the expense of competitors.[326]

Tax Avoidance

419. "The bourgeoisie are today evading taxes by bribery and through their connections; we must close all loopholes," Lenin said in 1918.[327] A century later billions of dollars of corporate profits go untaxed every year. How to tax businesses in the globalised digital economy, and how to distribute value, are questions at the heart of the future of the international tax system.

420. As the boundaries of firms now transcend borders and physical assets, it has become easier to shift profits to low tax jurisdictions (tax planning and tax avoidance) and harder for governments to identify illicit financial flows. The international tax system is in dire need of updating.

421. The OECD estimates that US$100-240 billion is lost in revenue annually as a result of base erosion and profit shifting by multinational companies. This is equivalent to 4-10 percent of global corporate income tax revenue. Another estimate suggests that the level of assets sheltered in tax havens is around 8 percent of global GDP.[328] Yet another suggests that multinationals shift around 45 percent of their profits to tax havens, causing a loss of 12 percent of global corporate tax revenues.[329] These losses are not symmetric across countries, however. The United States, Brazil, France, Japan, Australia, India and Mexico are among the countries estimated to be most negatively affected due to profit shifting; in contrast, countries such as Paraguay, Singapore, Georgia, Ireland, Bulgaria, Modolva, Romania, the United Kingdom, Indonesia, Turkey or China appear to gain revenue due to profit-shifting because their tax rates are lower than those elsewhere.[330]

422. Recent enforcement efforts indicate the magnitude of the problem. A voluntary disclosure program in India in 2016 encouraged 65,000 taxpayers to disclose $11 billion of previously undeclared assets, leading to an additional $6 billion in tax revenues.[331]

423. A multitude of loopholes exist in tax laws, many created through shrewd corporate lobbying, that allows corporations to increase their tax deductions and move profits to jurisdictions with low or zero corporate income tax. Some companies maintain hundreds of affiliates in low or zero tax economies to take advantage of the fact that taxation of a multinational group is done at the level of individual suvsidiaries that operate in different countries. Almost 60 percent of Fortune 500 companies in 2016 have at least one affiliate established in Bermuda or the Cayman Islands, both of which have a zero percent corporate income tax rate.[332]

424. The problem is that current rules are based on both source and residence. Source relates to a justification based on the geographic location of the income generating *activities* (the idea of 'where value is created' and linked to the physical presence of labor or capital). Residence refers to the place where the company receiving the income is considered to have its primary location, usually based on where the company is incorporated or effectively managed as per the *owner's* linkage to the state (residence, domicile or citizenship—physical presence). Source countries have primary taxing rights over the income from sales. Residence countries can tax multinationals' income from cash investments.

425. In practice, prevailing rules mean that multinational enterprises pay taxes in economies where they locate their affiliates and activities. Firms can organize their own internal cross-border production structures between affiliates, declaring different profits for different affiliates,

irrespective of direct value generation by each affiliate. It can be difficult to identify when these structures are legitimate and when they are established principally to avoid paying taxes in higher-tax jurisdictions.

426. Given the many opportunities that exist to avoid taxes, it is not surprising that firms do so. Transfer mispricing allows for charging lower prices for exports sold from high-tax to low-tax countries, or a higher price for inputs coming from low-tax countries. In addition, strategic location of management of intellectual property, international debt shifting through intracompany loans, treaty shopping, and tax deferrals are some of the mechanisms most often used to avoid taxes. It is estimated that a one percentage point larger tax rate differential between two jurisdictions reduces reported pre-tax profits of an affiliate by one percent.[333] Effective corporate taxation rates have a decisive impact on where affiliates locate.[334] Patents are also responsive: among European mutinational corporations, a one percent increase in the corporate tax rate reduces the probability of patent applications by around 3.5 percent.[335] Treaty-shopping is estimated to have reduced revenues in Sub-Saharan Africa by about 8.5 percent among countries having signed a treaty with an investment hub.[336] In fact, firms appear to be getting better at avoiding taxes since profits have become more sensitive to international tax differentials over time.[337]

427. The digital economy poses new challenges: the European Commission estimates that digital businesses in Europe face an effective tax rate of only 9.5 percent, compared with 23.2 percent for traditional business models.[338] The virtual nature of digital businesses makes it even easier to locate activities in low tax jurisdictions. The provision of goods and services from abroad, without physical presence in countries where consumers are located, escapes traditional corporate tax. Digital firms generate profit out of intangible assets, such as (foreign) user data or advertising. Identifying where value is created is difficult. Governments where consumers are located have no legal basis on which to collect taxes from companies outside the jurisdiction.

428. In 2016 the OECD released a template for collecting value added tax (VAT) from foreign suppliers of digital goods and services. More than 50 countries have adopted the Guidelines' recommendations for imposing VAT on the direct supply to consumers of services and intangibles by foreign suppliers.

429. The EU has also levied VAT on nonresident suppliers of telecommunications, broadcasting, and electronic services, regardless of scale, since January 2015. Nonresident businesses are required to charge the customer VAT at the rate applying in the customer's country, removing the competitive advantage held by digital companies located in countries with low VAT rates. This new VAT has raised more than €3 billion in taxes for the EU. Australia adopted a similar approach in July 2017. Singapore announced in its February 2018 budget that goods and services tax will be imposed on imported services, including digital services like music and movie streaming, starting from January 2020. Other advanced economies with indirect taxes on the digital economy include Japan, Korea, New Zealand, Norway, the Russian Federation, as well as South Africa.

430. Less has been done in emerging economies, where additional tax revenues are most needed. In 2017, Serbia and Taiwan, China, adopted models, extending their VAT regimes to cover digital suppliers. In 2018, Argentina and Turkey did the same. China, Malaysia, and Thailand are among the countries reviewing their tax laws to extend collection to digital profits.

431. As an alternative, a country could introduce a new, free-standing tax on foreign suppliers of digital services. A free-standing tax would do a better job of targeting foreign suppliers directly rather than domestic consumers. It would avoid conflict with existing double taxation agreements by separation from the mainstream income tax system. Nevertheless, this could raise questions of compliance with WTO rules on cross-border services trade. The risk of WTO non-compliance may be mitigated if the measure is framed as a tax on profits arising in the source country, since value is co-created by both the supplier and the customer in the digital economy (due to the value of user data).[339] Arguably this plays a role in leveling the playing field between domestic and foreign suppliers of digital services. As with VAT, collecting this kind of tax is enhanced through a registry of non-resident suppliers of digital services.

432. The Indian Government in 2016 introduced a six percent equalization levy on online advertising revenue paid by Indian companies to nonresident e-commerce companies. The European Commission in March 2018 proposed a tax on the gross revenues from digital activities in which users have a major role in value creation. The tax would apply to revenues from selling online advertising space, intermediary activities that allow users to interact and sell goods and services, and the sale of data.[340] The Commission has estimated that a 3 percent tax could raise €5 billion a year.

433. Alongside the adoption of new measures to tax digital business, governments are taking steps to address base erosion and profit shifting, as well as other tax avoidance or evasion schemes, by both digital and traditional business.[341] Some multinational firms have long shifted their profits around the world to so-called tax havens, which is the name often given to countries with low or zero tax rates. In doing so, firms reduce their tax burden. This phenomenon is not new, nor is it illegal, but it is easier in the digital economy. Fortune 500 companies are reportedly holding more than US$2.6 trillion in accumulated profits offshore.[342] The Paradise Papers, leaked in late 2017, disclose some of the most egregious examples.[343]

434. Governments have been taking steps to reduce tax avoidance at the multilateral level. The Base Erosion and Profit Shifting (BEPS) initiative launched by the OECD and G20 countries in 2013 brings together more than 100 countries, regional tax organizations, and international organizations, including the World Bank, to develop new tax standards to reduce tax avoidance. The measures to be adopted by signatories to strengthen both source and residence taxation, but group negotiated a comprehensive package of putting more emphasis on the source principle. Emphasizing the source principle better aligns the location of taxable profits with the location of economic activity and value creation and improves the information available to tax authorities.

435. Further incremental steps to strengthen tax administration within the separate accounting system might include widening the definition of a "permanent establishment" to recognize that companies can conduct considerable business in a country without having much of a physical presence; strengthening transfer pricing and anti-avoidance rules and audit capacity by emerging economies (including in areas such as thin capitalisation); adopting some aspects of formulary apportionment when implementing the arm's length principle; adjusting tax incentives, potentially through regional cooperation agreements; and targeted anti-tax-avoidance measures such as strengthened controlled foreign corporation rules.

436. Countries may take some of these steps unilaterally. New rules entered into force in the United Kingdom in 2015 that allow firms to pay taxes up front. The rules designed to incentivize greater compliance with the mainstream corporate income tax regime, for example, entered into force in the United Kingdom in the same year. Australia adopted similar rules in 2016. However, these countries already have a developed transfer pricing capacity and a sophisticated suite of anti-avoidance measures. But the context for emerging economies is rather different: their capacity to address transfer pricing risks is low: existing anti-avoidance legislation may not be effective. A more mechanical and targeted anti-diversion rule that is integrated into the corporate tax system could be more effective at tackling tax avoidance directly, rather than as an indirect deterrence measure. Emerging economies could apply anti-diversion rules automatically to entities that meet certain minimum criteria, for example, where entities are related, subject to a low rate of taxation, and generate super-profits (as defined in the law). In that case, the additional charge would apply to any related entity satisfying those criteria, regardless of whether it has any direct dealings with taxpayers in the country. This would provide a more mechanical back-up to transfer pricing rules that would help governments secure their tax base.

437. Governments can also take steps to shut down tax havens. Economic sanctions are an option, facilitated by a list of countries deemed to offer preferential tax treatment. Argentina issued in 2000 a list of countries with preferential tax regimes. Transactions between affiliates located in those countries and in Argentina were automatically subject to additional monitoring and reporting requirements. In 2013, the government changed its approach, replacing the list with a list of cooperative countries—those that made or are in the process of negotiating double taxation treaties or other agreements on the exchange of information for tax purposes with Argentina. Countries not on the list are "non-cooperative", resulting in the application of more stringent rules to transactions with corporate affiliates located there.

438. Brazil has a list of tax havens since 2010. A double taxation treaty or any other agreements on the exchange of information for tax purposes with Brazil is not sufficient to avoid being included in the list. The Council of the European Union issued in 2017 a list of 17 third country jurisdictions deemed non-cooperative for tax purposes. Some jurisdictions made commitments to remedy EU concerns and the non-cooperation list was revised down to nine. Listed countries face reputational damage and may not receive funds from EU member governments other than for development purposes.

439. Growing public discontent with tax avoidance practices has revived discussions around more significant overhauls to the international tax system. Global formulary apportionment, a source-based tax, would divide the tax base between jurisdictions according to the location where "source" activities take place. Countries would have to agree upon a formula to allocate profits based on "allocation keys", usually tangible assets such as volume of sales to third parties, assets, payroll, and/or headcount of staff in each jurisdiction.[344] This system is used domestically in countries such as Canada and Switzerland to apportion income amongst states and cantons. It was proposed for the European Union in 2016 (the "Common Consolidated Corporate Tax Base").

440. Global formulary apportionment would remove existing incentives for profit shifting to low tax jurisdictions via transfer pricing. However, it creates incentives for other methods of profit shifting.[345] The introduction of formulary apportionment faces significant hurdles, not least an agreement among major economies on the rules used to allocate corporate income. The divergent

interests of countries would make such an agreement difficult to achieve. Emerging economies with less bargaining power may suffer in any such negotiation. Efforts to model the distributional impacts of adopting a formulary system indicate that emerging economies (specifically, Brazil, Chile, China, Colombia, Egypt, India, Malaysia, Mexico, Peru, the Philippines, South Africa and Thailand) only gain when the allocation formula places a heavy weight on employment headcount. They lose if the apportionment factor is based on assets or payroll and come out slightly ahead if the apportionment is by sales. Unilateral moves to formulary apportionment risk double taxation of some income and non-taxation of other income.

441. Another approach is to reform the residence principle in corporate taxation to restore the link between the place of residence or domicile of shareholders and the taxation of corporations.[346] One proposal is to eliminate the corporate tax entirely and tax profits in the hands of shareholders.[347] A second approach is integration, where corporate tax is treated as a withholding tax on dividends, with shareholders receiving credits for taxes paid at the corporate level. In Australia, corporations can distribute "franked" dividends that carry a credit for corporate level taxes already paid. A third approach is to tax realized capital gains when an asset is sold and add on an interest charge for deferred tax liabilities during the holding period.

442. Residence-based taxation is often dismissed on the basis that residency of ultimate owners is hard to track and taxpayers may fail to declare their foreign holdings and hide their domestic holdings through foreign intermediaries ("round tripping"). Work has progressed on this in recent years, through beneficial ownership registration and automatic exchange of information, which may remove some of these administration concerns. Nevertheless, emerging economies generally rely on source taxation—residence is not a concept that favours them and it is likely they would lose direct revenues.

443. Yet another option is to tax based on destination, moving away from both the source and residence based approaches altogether. A destination-based system would be aligned to where sales take place or where final consumers are resident. There are two main proposals: the first is a form of unitary formulary taxation with sales as the apportionment factor, the second is a destination-based cash flow tax.

444. A sales base unitary approach would be a major shift away from the historic, mainly source-based approach to corporate taxation. Sales-based tax would be simpler to administer than a formula with assets and payroll included. There is less tax competition pressure because companies will respond to where consumers are. Shifting to a sales-based approach would put the nexus of taxation on activity that is relatively immobile.

445. In a destination-based cash flow tax (or "border adjusted tax"), the tax base is not consolidated, but each country taxes net income from sales in the purchaser's place of residence. Expenses incurred in the same country can be deducted, but not foreign expenses. This means all local sales are included in the tax base minus local costs; with a zero tax on exports and no deductions for non-local costs. A destination-based cash flow tax should not distort either the scale or the location of business investment and eliminates the tax bias towards debt finance. It is robust against avoidance through use of intercompany debt, locating intangible property in low-tax jurisdictions and mispricing inter-company transactions.

Chapter 7: Ideas for Social Inclusion

446. "I am the State" is how Louis XIV expressed his view of the social contract. At the other extreme, Lenin argued that "socialism can only take shape and be consolidated when the working class has learned how to run the economy and when the authority of the working people has been firmly established."[348] Not long after the revolution of 1917, ownership of all assets was transferred to workers and peasants.

447. The French Revolution and socialist movements, among others, have all been about a quest for a new social contract to adapt to large scale societal pressures. The English *Magna Carta Libertatum* ("the Great Charter of Liberties") was an earlier attempt to protect individual freedoms against the King. Introduced in 1215, the document influenced the formulation of, among others, the Constitution of the United States. These documents, too, defined a social contract.

448. Old and new pressures on today's social contracts call again for new ideas. On the one hand, cracks in current social contracts are evident in the lack of protections or efficient public services for most of the poor. Stubbornly high inequality indicates the same. On the other hand, the changing nature of work is generating fears about mass unemployment, a race to the bottom in social protections. Fears of climbing inequality are rife. These factors, among others, are straining the relationship between citizens, firms, and governments in both emerging and advanced economies.

449. While some of these fears appear to be exaggerated, there are indeed reasons to be concerned. Technological developments today merit the injection of new ideas into public debates about social inclusion. Two elements require particular attention.

450. First, technology opens up new avenues to reach society. Governments have new ways to reach the poor as well as many others who lack access to quality services or tools to manage risks. Many work informally without access to protections in low-productivity jobs, making it difficult to escape or remain out of poverty. Informality, for example, constrains what can be done through social insurance systems that are based on formal earnings contributions that need to be declared to the state.

451. Second, the adjustment costs related to the changing nature of work. Technology has varying impacts on different skills and their demand in the labor market. Depending on the technology, some skills, and hence some workers, are becoming more relevant than others in the world of work. Advanced skills—like complex problem solving or critical thinking—are becoming more valued in labor markets. These skills help individuals work more effectively with new, changing technologies. Socio-emotional skills—like empathy, teamwork, conflict-resolution—are also becoming more valuable in labor markets because they cannot easily be replicated by machines.

452. This is the right time to think about how to improve social inclusion. The changes outlined above require time to take hold. The politics of some of the reforms needed are complex given potential trade-offs involved between, for example, investments in the current generation of workers versus future generations. Public spending would need to become more efficient.

Additional sources of revenue need to be identified. At the same time, there is urgency given rising aspirations, especially among the youth. Social media and urbanization contribute to these rising aspirations. When met, aspirations can foster opportunity and prosperity. But when aspirations are unfulfilled, they can lead to frustration, potentially even fragility in countries. The sustainability of a social contract hinges, thus, on a sense of fairness.

453. A social contract envisions the state's obligations to citizens and what the state expects in return. This basic conception has evolved over time. For much of history, social contracts have been imposed by force or threat of it. Rulers governed by "divine law", wherein protection was provided in return for obedience. This idea was challenged in the 1600s by Thomas Hobbes and John Locke who embedded the relationship between state and citizens in rational thought rather than religion. A social contract imposes an obligation on citizens to respect and obey the state, in exchange for security. In most societies, the obligation of the state extends beyond simply providing safety. It includes broad provisions around services, jobs, and public goods.

454. Arguably, the sustainability of social contracts hinges, at least partly, on how fair it is perceived to be. This echoes Rawls' need for a veil of ignorance when thinking about the social contract, that is, ignoring, among others, one's place in society, traits, or skills. Similarly, in the 1762 book "On the Social Contract; or, Principles of Political Rights", Rousseau posits that everyone will be free because they all forfeit the same number of rights and are imposed the same duties. This is the view this chapter takes of the social contract: a policy package that aims to contribute to a fairer society.

455. This chapter addresses three questions: how can society think about a new social contract in the context of informality and the changing nature of work? If the government is given a mandate to prepare a social contract aimed at improving fairness in society, what could its basic ingredients be? Related, how could the state finance the package of proposed reforms so that these can be adopted? This exercise sets out a scenario that politicians could consider as part of legislative processes and national consultations involving multiple stakeholders. The package described here is not meant to be exhaustive. Instead, the discussion lays out a menu of policies that could ignite a renewed societal dialogue.

A New "New Deal"?

456. "The social contract is broken... there is a culture of not participating, of not caring, of silence", was one of the voices from areas affected by rampant insecurity in Mexico.[349] Cracks on current social contracts are already evident in, for example, the Arab Spring and the backlash against globalization reflected in rising protectionism. In many developing countries, a dysfunctional social contract may lead to exerting less demand on the state to improve public service provision. As a result, evidence from developing countries suggests that the middle class may sometimes "…send their children to private schools, use private healthcare, dig their own boreholes for water, and buy their own generators".[350]

457. One possible explanation for pervasive dissatisfactions with existing social contracts is the sense that these contracts are unfair. Societies offer limited opportunities for upward mobility to the poor or marginalized. The more limited these opportunities—the more unfair a social contract

becomes. This perceived “unfairness” is only heightened in the current era because the risk of income instability is higher.

458. Mechanisms to ensure equal opportunity, which ensure social inclusion, often fall short, especially in developing countries. For example, countries are under-investing in the early years of children’s lives, particularly among disadvantaged groups, and an unequal education system perpetuates inequality. In Latin America per capita government spending on children under 5 is one-third that for children 6 to 11. In Sub-Saharan Africa, only 2 percent of the education budget goes to pre-primary education.[351] Similarly, tax and social protection systems in developing countries redistribute income to a limited extent. This is because both revenue collection and social protection spending are low.

459. Persistently high levels of informality are both symptomatic of and causal in the erosion of social contracts. Informal employment is more than 70 percent in Sub-Saharan Africa and South Asia; it is more than 50 percent in Latin America. Informal workers are beyond the reach of the state with respect to provision, protection, and redistribution. At the same time, those operating in the informal economy evade their obligations to the state, for example in paying taxes. When social contracts are found to be unfair, informality can become the opt-out option. Informality reflects a lack of trust in the state.[352]

460. Recent examples of substantially new social contracts, or their elements, include “flexicurity” in Denmark, with its roots in the nineteenth century. These new social contracts combine labor market flexibility with strong social security and active labor market programs. Other examples include the economic reforms introducing market principles that began in China since 1978; the Balcerowicz Plan in Poland in 1989; as well as the Hartz reforms in Germany in 2003. Arguably, however, when people think about social contracts that involve significant reforms associated with the world of work, the New Deal under Franklin Roosevelt’s presidency of the United States is a common yardstick for ambition and approach. The reference evokes the need to substantially subsidize employment (or tax robots) in response to technological progress. The allusion, however, is disingenuous.

461. Between 1929 and 1933, with the Great Depression, the unemployment rate had skyrocketed from 3 percent to 25 percent. Industrial output had halved. Given the dismal state of the economy, as Franklin Roosevelt accepted his party’s presidential nomination in 1932, he pledged “a new deal for the American people.” The “New Deal” came to encompass the programs and reforms his administration put in place from 1933 to 1938 to lift the country out of the Great Depression.

462. The job-creation component of the New Deal included four main programs.[353] The Public Works Administration (PWA) was the primary source for public works funding until 1938. With an average spending of about 1.3 percent of GDP, PWA projects accounted for nearly 70 percent of all new schools built in the country. Programs were active in nearly every county, employing about 0.3 percent of the labor force. The Civilian Conservation Corps (CCC) operated from 1933 to 1942. Works were mainly implemented in rural areas, targeting unemployed youth. Participation was limited to a maximum of two years. The program generated employment for about 3 million individuals (or 0.4 percent of labor force each year), with about one-third of the budget spent on wages. The Jobs Corps introduced in 1964 was modeled after it.

463. The Civil Works Administration (CWA) was introduced as an emergency initiative in the winter of 1933-34. While it lasted only 5 months, the CWA's scale-up speed and overall coverage were impressive: in 10 weeks, it reached up to 4.2 million beneficiaries or 8 percent of labor force. Finally, the Works Progress Administration (WPA) employed about 2.4 million individuals every month from December 1935 to June 1940 (or 28 percent of unemployed at any point of time), costing about 2.6 percent of GDP. The target population included the long-term unemployed which were largely excluded from the labor market. This program ended in 1943.

464. Job creation measures were complemented by a series of additional regulatory and system-wide reforms: the Federal Deposit Insurance Corporation to insure bank deposits and supervise state banks; the Securities Act of 1933 to codify standards for sale and purchase of stocks; the Social Security Act, financed through payroll tax contributions, to provide financial assistance to the elderly and the disabled; the Surplus Commodities Program to give away food to the poor, later converted into the Supplemental Nutrition Assistance Program ("food stamps"); the Wagner Labor Relations Act to guarantee workers the right to unionize and bargain collectively; the Fair Labor Standards Act to regulate working hours, set an hourly minimum wage, and restrict child labor. These programs still exist today in 2018. The latter four are the foundation of social welfare and workers' protections system in the United States.

465. The New Deal, albeit bold and comprehensive, was a response to a problem that is different to that faced in 2018 in the context of informality in developing countries or the changing nature of work everywhere. Most notably, while the Great Depression was largely a transitory shock to the American economy, expected changes in the nature of work and persistent informality are anything but transitory. Some of the measures included in the New Deal—such as the Federal Deposit Insurance Corporation or the Supplemental Nutrition Assistance Program—addressed not only the temporary shock of the Depression but also a permanent need for such protections beyond the crisis. However, the largest programs, especially those subsidizing employment or earnings were temporary—appropriately so.

466. Managing informality and the consequences of the changing nature of work requires solutions that recognize that—while these areas are amenable to policy—they generate changes that are not transitory. Solutions focused on providing a temporary boost to labor demand, delaying technological change, or propping up sectors or occupations that become uncompetitive are bound to be unsuccessful.

467. The changing nature of work requires a revisit of social contracts and puts equality of opportunity at their center. For people, equality of opportunity entails fostering job creation, as well as making early childhood investments. One estimate suggests that expansion of early childhood development in the United States could reduce inequality by 7 percent and increase intergenerational mobility of income by 30 percent.[354] In addition, it means boosting social protections, including both social assistance and insurance, in ways that are compatible with all forms of work.

468. A new social contract should also foster open social dialogue with diverse actors: from small informal enterprises to superstar firms—and from informal self-employed workers to wage employers—different voices are emerging in the world of work. An effective social dialogue promotes this diversity. Social media tools open the door for engagement. These elements of the

social contract, hence, echo the three freedoms discussed by Nobel Prize winner Amartya Sen in "Development as Freedom": political freedoms and transparency in relations between people; freedom of opportunity; and economic protection from abject poverty.

469. Beyond some core elements, aspects of a social contract would need to be tailored. One clear area of customization relates to demographic trends. By 2050, more than half of global population growth is projected to occur in Sub-Saharan Africa. There, annual growth rates of working age population are projected to be over 2.7 percent.[355] In contrast, the populations of East Asia and the Pacific are rapidly-aging: more than 211 million people ages 65 and over live in this region, accounting for 36 percent of the global population in that age group. By 2040, the working-age population will shrink by 10-15 percent in Korea, China, and Thailand.[356] Countries in Sub-Saharan Africa and South Asia, thus, would need to be particularly responsive to the needs of large youth cohorts entering the labor market to ensure the sustainability of the social contract. In Eastern Europe or in East Asia, in addition, social contracts would also need to create, for example, mechanisms to ensure the sustainable financing of elderly protection and care.

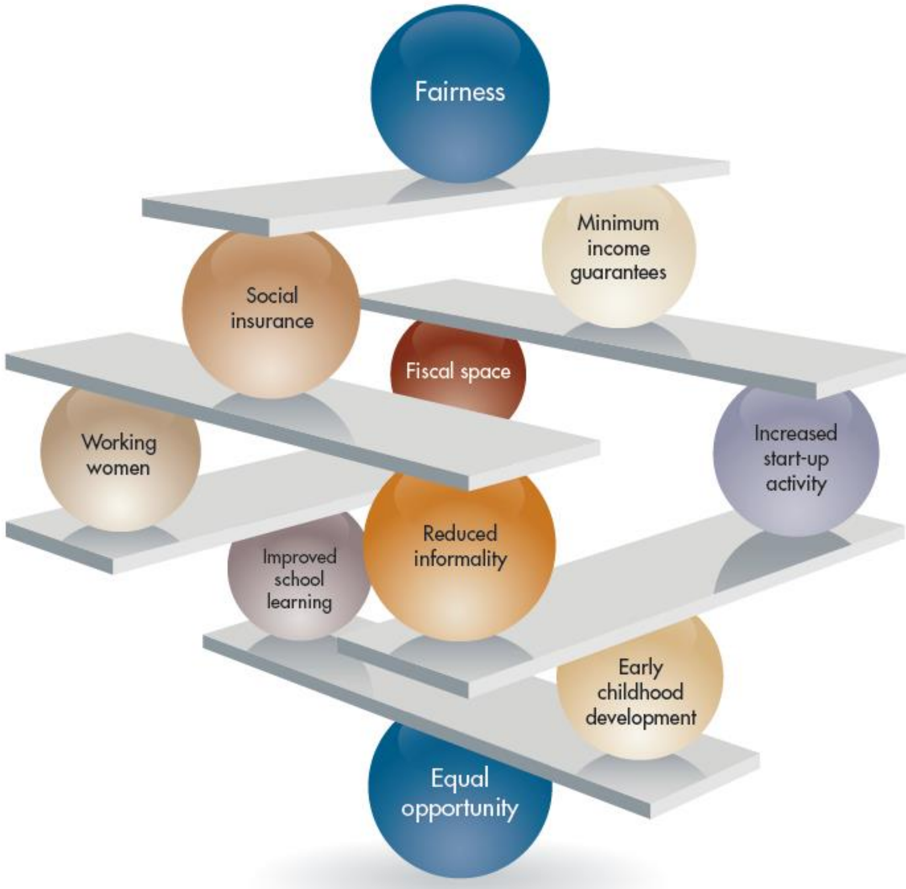
Possible Elements of a New Social Contract

470. Possible elements of a social contract could include: investing early in human capital; taxing firms; and expanding social protection to provide a socially acceptable minimum income and insurance (figure 7.1). The overall goal of these elements is to achieve equality of opportunity.

471. A society with equality of opportunity is often defined as a society that manages to give all its members an equal chance to attain economic and social well-being. This can only happen if everyone has access to some minimum levels of health, education, and social protection. This basic human capital puts everyone on an equal footing to pursue their goals.

472. In most countries, existing social contracts guarantee access to basic education. However, the changing nature of work necessitates a reexamination of this basic contract. The labor market increasingly values advanced cognitive and socio-emotional skills, which complement technology and make workers more adaptable. This means that unless everyone has a fair shot at acquiring these skills, inequality will increase. In fact, given the changing nature of work, education is likely to be one of the strongest mechanisms for transmitting inequalities from one generation to the next. A new social contract would level the playing field for skills acquisition. The most direct way to provide fairness is to support early childhood development. Guaranteeing that every child has access to adequate nutrition, health, education, and protection in early years ensures a solid foundation for skill development in the future. As skills acquisition is cumulative, returns to early investments is the highest.

Figure 7.1. Elements of a social contract



Source: Authors' calculations.

473. The changing nature of work makes basic literacy and numeracy survival skills. They are required for simply navigating life—for buying medication, for applying to jobs, for interpreting campaign promises. The ability to read and manipulate numbers also serves as a prerequisite for acquiring advanced skills. However, for too many schooling does not translate into learning. Millions of children in low- and middle-income countries attend school for 4-5 years without acquiring basic literacy and numeracy. Consequently, guaranteeing access to basic education is not enough. A new social contract needs to guarantee actual learning, ensuring that schooling leads to literacy and numeracy for all.

474. A social contract for early childhood development would ideally have three components. The first component ensures that children have the essential inputs so they are healthy, well-nourished and stimulated during their first 1,000 days (-9 months to 24 months of age). This means access to prenatal healthcare, immunizations, micronutrients, as well as parental outreach on the importance of breastfeeding and early stimulation. The second component ensures access to quality early learning during their "next 1,000 days" (25 months to 60 months). This means at least one year of quality preschool so that they are ready for primary school. These pre-primary programs need to be designed for young children with age-appropriate curricula and capable and qualified teachers. The third component is birth registration, whereby children are recognized by

the State with the ability to access essential services throughout their life. The elements outlined above—prenatal healthcare, birth assistance, immunizations, micronutrients, parental outreach, quality pre-school, and birth registration—present a basic package to address children's early development and learning needs. A more comprehensive package would include investments in safe water and adequate sanitation as well. Increasingly, quality air also becomes important for children to grow up in a healthy environment. However, more research is needed to identify impactful programs in low income country contexts.

475. Some countries are already trying to deliver this type of social contract. In Cuba's early childhood development program, children's growth and development are regularly monitored. At the beginning of each school year the education sector identifies families who need specific attention, to monitor and prevent any negative impact on child development. Similarly, Chile's *Crece Contigo* includes a *programa de acompañamiento familiar*, which works with families, pregnant women and children under grade 4 who are in situations of health and social risk. The Government of Peru has simplified birth registration process for easier access to early childhood development services. Its multi-sector program also supports parents in monitoring children's growth and health, and engaging in early stimulation activities. France passed a law in 2018 to ensure that all children have access to pre-school starting at age 3.

476. A social contract on literacy and numeracy would ensure that students master these skills by grade 3 (approximately age 10). Schools around the world expect students to acquire these skills by grade 3 because by this stage students need to read to access the rest of the curriculum. Children who cannot read by grade 3 struggle to catch up, eventually falling so far behind that no learning takes place at all. The core ingredients of this element would include: learning assessments at end of grade 3 to shine a light on those who are at risk, and early grade reading and math assistance for students in grades 1-3 who need additional support. A more comprehensive package would add items including ensuring a pupil-teacher ratio of no more than 40:1 in primary grades, and providing adequate learning materials with a target of one pupil one textbook in primary grades.

477. There are good models for supporting literacy and numeracy by grade 3. Research has shown that Early Grade Reading and Teaching at the Right Level interventions are both cost-effective and scalable, even in resource-constrained contexts. In Liberia and Malawi, training teachers to better evaluate their students combined with additional materials significantly improved learning in early grades. In Singapore, all students are screened at the start of grade 1. Those who have not attained developmentally appropriate early literacy skills will be supported through the Learning Support Programme. These approaches are scripted and straightforward. They train teachers to assess their students through ongoing, simple measurement of their ability to read, write, comprehend and do basic arithmetic. Those who need additional support are provided this support through targeted activities and materials. Such models have been tested with success in contexts as varied as India, Ghana, Kenya, or Jordan. These models form a basis of precise design and costing.

478. Governments have an important role to play in promoting job creation. Most countries want a mix of policies to support large firms and smaller, nascent enterprises. A job creation strategy should start first with the elimination of economic distortions to facilitate the reallocation of labor towards the most productive firms, encouraging them to grow. Possible policies include improving

the general business environment, promoting foreign direct investment, and infrastructure policies. Anti-trust regulation is complement to ensure the dominant position of superstars is contestable.

479. Second, governments can promote employment growth by supporting entrepreneurship. Start-up and high-growth firms are important for job creation as they typically account for a large proportion of new jobs generated. Easing business regulations and improving connectivity-related infrastructure can support these firms' growth. Successful identification of start-ups that will grow in the future is inherently difficult. That said, some initiatives are more useful than others, such as: business plan competitions, programs that prepare entrepreneurs for being investment-ready, export promotion initiatives, and support services to strengthen input-supplier linkages between small and large firms.

480. Part of the jobs creation agenda in the formal sector includes reducing the cost of hiring workers. Lower hiring costs enables firms to adapt their workforce to changing skills demands. As a first step, countries can relax some of the most stringent labor regulations, especially those negatively affecting low-productivity workers. In many cases, labor regulations—including legislated minimum wages, constraints on hiring and dismissal decisions, and severance pay—make it too expensive for firms to adjust their workforce. For example, in Pakistan the maximum length of a temporary contract, including renewals, is 9 months. The minimum wage is twice the value added per worker (a rough proxy for average labor productivity) in Liberia or Zimbabwe. Third-party approval is needed in the case of the dismissal of even one worker in countries like Angola, Egypt, Honduras or Indonesia. Linking protections to how and where people work leaves unprotected most informal workers. Instead, more flexible labor regulations would come in tandem with enhanced social protection provided independently of the work contract.

481. A social contract also requires all economic actors to pay taxes. This is currently not the case. It is estimated that in the European Union traditional companies have paid an effective corporate tax rate of 23.2 percent, while digital companies pay on average only 9.5 percent.[357]

482. The platform economy makes taxation of these global firms difficult. Large digital businesses rely heavily on intangible assets (e.g., algorithms that facilitate personalized advertisement). They have few tangible assets (e.g. Careem, the leading ride-hailing firm in the Middle East and North Africa region owns no cars). Also, they have sales that bare little relationship to where the company has a physical presence and a significant part of their value is user-generated (e.g., social media).

483. These features may be particularly salient in digital platforms, but they are not unique to these firms. For example, pharmaceutical companies have many intangible assets. Traditional exporters sell with no physical presence at the destination. Estimates suggest that the level of assets sheltered in tax heavens is around 8 percent of global GDP.[358]

484. The new social contract would also include elements of social protection. Increased risks in the world of work make it imperative to adapt how societies protect workers. A new social contract could provide a minimum income, combined with basic universal social insurance, that is decoupled from how or where people work. Such minimum could take many forms. For example, it could be achieved through a multiplicity of programs or by expanding individual interventions. It could also be achieved through a Universal Basic Income (UBI), an option that remains untested

but is, with some modifications, an extension of familiar unconditional cash transfer schemes. Each of these modalities present different comparative advantages, fiscal, political, and administrative implications.

485. Low and middle-income countries have made significant headway in social assistance. For example, in Tanzania spending on conditional cash transfers increased tenfold between 2013 and 2016. The program currently reaches 16 percent of the population and claims 0.3 percent of GDP. Similarly, spending on conditional cash transfers in the Philippines grew five-fold over 2009-2015: the *Pantawid* program covers 20 percent of the population at a cost of 0.5 percent of GDP. These trends mirror the growth in categorical or age-based programs like the Child Support Grant in South Africa. The scheme's coverage increased from 1 million beneficiareis in 2001 to 11 million in 2014, absorbing from 0.2 to 1.2 percent of GDP, respectively.

486. Current experiences offer a wide gamut of tested programs to be considered for scale-up. Whether existing or new, programs should share the notion of 'progressive universalism'. This principle deliberately aims at higher levels of coverage while ensuring that the poor would benefit more and before others in the scale up process. Where exactly in the income distribution one becomes a net beneficiary instead of a net payer is a choice that societies can make based on their preferences and capabilities.

487. In addition, social insurance systems that cover, for example, old age and disability pensions, are based on a standard employer-employee relationship with limited suitability for developing countries. New forms of work increasingly challenge this model also in advanced economies. As a result, informal workers can lack access to that kind of support. Also, the system is financed by labor taxes that raise the costs of hiring workers. As social contracts are reimagined, subsidizing a basic level of social insurance—especially for the poor—can be considered. Such reform could also reduce labor costs as the financing of the system is at least partly shifted away from labor taxes towards general taxation.

Financing Social Inclusion

488. Social inclusion is costly (table 7.1). Simulations suggest that the component of building human capital, including early childhood development and support for literacy and numeracy by grade 3, would cost around 2.7 percent of GDP in low income countries. In lower middle income countries that figure is 1.2 percent of GDP. Costs for a more comprehensive human capital package are estimated at 11.5 and 2.3 percent of GDP in low income and lower middle income countries, respectively. These estimates are based on unit costs of fully-costed models in developing countries combined with data-driven assumptions. These are the costs of delivering the human capital package, irrespective of income level or coverage of existing programs. As such they present upper-bounds to more targeted interventions that build on existing programs. Given that costs are likely to differ by country, estimates are provided for three scenarios, one low income country (Mali), one lower middle income country (Indonesia), and one upper middle income country (Colombia).

489. The cost of enhancing social assistance to provide a guaranteed minimum would also vary by context and design choices made. Being the option that would attain the highest coverage and have the highest cost, a UBI could illustrate the upper-bound of a social assistance package. A

"basic" social assistance package that would cost 9.6 percent of GDP in low income countries, 5.1 percent in lower middle-income countries, and 3.5 in upper-middle income settings. These estimates use a UBI set at the average poverty gap level, aimed at adults. A more ambitious package, exemplified by a universal basic income that reaches everyone including children, would cost 9 and 5.2 percent of GDP in lower and upper middle-income countries, respectively; in the poorest countries, the cost of such a package would be in double-digits.[359]

490. Providing economic opportunities for young adults is a critical element of social contracts. However, the pace of jobs creation for new labor market entrant has often been slow. Moreover, for many youths, market failures and persistent gaps in access to productive assets (e.g., adequate skills) are barriers to employment. International experiences on 'productive inclusion' of poor and vulnerable youth show that a wide array of programs is available for connecting youth to wage and self-employment. Interventions may include wage subsidies, public works schemes, entrepreneurship grants or asset transfers (often part of 'graduation' models), coaching, apprenticeships, internships, and various forms of training. Empirical evidence shows that these programs have mixed effects, with profiling, design and contexts largely shaping their cost-effectiveness. Those interventions may present distinct spatial salience: for instance, wage subsidies may be appropriate in peri-urban contexts with large industrial parks, while graduation schemes are largely devised for rural populations (including the transfer of assets like livestock, etc.).

491. The specific youth cohort between 20 and 29 years of age, for example, includes 1 billion youth.[360] Pending on content of the package, average intervention costs range from US$831 to US$1,079 per participant.[361] In this regard, the total cost for reaching vulnerable young adult, or 12.8 percent of the age cohort,[362] would amount to between 2.9 and 3.8 percent of average GDP in low-income countries; in lower-middle income settings, the cost would be between 0.9 and 1.1 percent of average GDP, while in upper middle-income countries the cost would range from 0.2 to 0.3 percent of average GDP.

Table 7.1. Estimated costs of selected elements of a renewed social contract (% of GDP)

	Human Capital Package		**Social Assistance Package (as exemplified by UBI)**		**Young Adults Package (productive inclusion)**	
Income Group	***Basic***	***More Comprehensive***	***Basic***	***More Comprehensive***	***Basic***	***More Comprehensive***
Low Income Countries	2.7	11.5	9.6	19.3	2.9	3.8
Lower Middle-Income Countries	1.2	2.3	5.1	9	0.9	1.1
Upper Middle-Income Countries	0.8	3.0	3.5	5.2	0.2	0.3

Source: Authors, based on preliminary results (for Human Capital Package, see Zheng and Sabarwal 2018).
Note: The basic human capital package includes (1) supporting early childhood development, including prenatal healthcare, birth assistance, immunizations, micronutrients, parental outreach, birth registration, and at least 1 year of quality pre-school for every child; (2) learning assessments at end of grade 3 to shine a light on those who are at risk; (3) early grade reading and math assistance for students in grades 1-3 who need additional support. The more comprehensive human capital package includes, in addition to the basic package, the following elements: (1) access to safe water and adequate sanitation; (2) a pupil-teacher ratio of no more than 40:1 in primary grades; (3) one pupil one textbook in primary grades. Element-specific unit costs are derived from rigorous studies of relevant in-country programs, where available. Alternatively, the most recent cost estimates appropriate for the country's income level are considered. Beneficiary calculations are based on population data from United Nations World Population Prospects. Other country-level data such as GDP, access to safe water and sanitations, and prevailing proficiency rates are derived

from World Development Indicators and other studies. The basic social assistance package includes UBI for adults set at the average poverty gap level. The more comprehensive social assistance package includes UBI for the full population set at the average poverty gap level. See chapter 6 for more details on the UBI costing. Estimates are based on specific countries for each country grouping. As such, results are meant to be indicative. See endnotes for young adults estimates method.

492. A new social contract would therefore require additional government revenues in the order of 6-8 percentage points of GDP. This will demand a significant tax effort by most governments around the world. This effort is likely to encompass a mix of additional revenues from existing taxes (through increases in rates or widening of the tax base), the introduction of new taxes, and improvements in tax administration. The elimination of regressive subsidies, especially energy subsidies, can also help finance the proposed elemements of the social contract.

493. A first potential source of revenue lies with the value-added tax (VAT). Such taxes do not distort productive activity. They do not penalize the most successful companies and individuals. They are also easier to collect than many other taxes. VAT typically accounts for one quarter of all tax revenue and it is generally considered a relatively efficient tax. The potential for additional revenues from a VAT is signficant, especialy through expansions of the base rather than increasing standard rates. Sub-Saharan African countries, on average, could raise around 3 to 5 percent of GDP in additional revenues through a combination of reforms that improve the effiency of current systems (through the reduction of tax exemptions, for example) and through institutional changes, including improvements in governance.[363]

494. The value-added tax can be regressive, however. The poor spend a larger share of their income on consumption than the rich. That said, this is not necessarily the case: among advanced economies, consumption taxes are regressive when measured as a percentage of household income, but are generally either proportional or slightly progressive when measured as a percentage of household expenditure.[364] In many countries basic food products like milk, bread, and some medical products are exempt from the value added tax to ensure that the poor can buy these necessities. Moreover, the incidence of taxes needs to be assessed in tandem with the distributional impacts of public expenditures since potentially negative distributional impacts from a particular tax can be counterbalanced on the expenditure side.

495. The average value added tax rate in advanced economies in 2017 was 19 percent, with the United States the only OECD country without a value added tax. China implemented a value added tax in 1994 and currently collects nearly 48 percent of its revenues from it. The Russian Federation charges an 18 percent value added tax, while Brazil charges a base value added tax of 17 percent, and some Brazilian states add a percentage point or two above that base. The largest change in value-added taxation is taking place in India, where a nationwide tax at 18 percent, known in India as the goods and services tax, replaces over a dozen excise duties, services taxes, and interstate customs duties and surcharges, as well as the state-level value added tax and the interstate entry tax, which are charged as goods cross state borders in India.

496. For countries that do not have a value-added tax, introducing one would be a first step. This is the case of the Maldives and Myanmar, for example. Sub-Saharan African countries that continue to rely on sales taxes can also switch to a VAT. These include Angola, Comoros, Guinea-Bissau, Liberia and Sao Tome and Principe.

497. For countries that already have a value-added tax, closing tax exemptions and converging toward a uniform tax rate, could raise significant revenues. In Sub-Saharan Africa, Lesotho, Mauritius, Senegal, and South Africa do not have that many exemptions; in contrast, Cameroon, Malawi and Zambia, for example, have very extensive lists of exemptions.[365] In countries like Costa Rica, Honduras, the Dominican Republic and Uruguay, for example, tax expenditures related to the value-added tax are estimated to cost more than 3 percent of GDP.[366] In Vietnam, moving to a uniform VAT rate of 10 percent and significantly narrowing the list of exemptions could increase tax revenues by 11 percent.[367] Additional revenues are likely to come not only from higher taxes on goods or services under "preferential" rates, but also from higher collection rates overall as the simplification of the system can improve efficiency.

498. Importantly, eliminating VAT exemptions does not need to be regressive. Simulations for four low and middle-income countries—Ethiopia, Ghana, Senegal and Zambia—show that, although preferential VAT rates reduce poverty in those countries, they are not well targeted towards poor households overall. As a result, a UBI funded by 75 percent of the revenue gains from a broader VAT base—despite being completely untargeted—would create large net gains for poor households and reduce inequality.[368] Preferential rates on food or energy, often introduced to support the poor, do provide a proportionately greater benefit to the poor than to the rich. However, rich households benefit vastly more in aggregate terms than poor households. Preferential rates introduced with other objectives, as when lower rates are applied to books or hotel accommodations, are, in fact, regressive.

499. A second potential source of additional revenues are excise taxes. For example, the average revenue from excise taxes on alcohol and tobacco in the European Union is 0.3 percent of GDP. However, several countries are more dependent than others on such taxes: Estonia at 4.8 percent in 2016; Luxembourg at 2.5 percent; the Czech Republic, Ireland, and the Netherlands at about 1.5 percent. Saudi Arabia adopted excise tax regulations in 2017: 50 percent on soft drinks, and 100 percent on energy drinks, tobacco, and tobacco products. The "sugar" tax is a new phenomenon. Croatia has had such taxes on all sugar and coffee-based products since 2014. Ireland approved a "soda tax" set to start in mid-2018, which is around the same time a similar tax takes effect in the United Kingdom. Some of these taxes—such as tobacco taxes—are deemed regressive as the poorest families tend to allocate larger shares of their budget to them. However, when looked at comprehensively, including benefits from lower medical expenses and longer, healthier working lives, benefits far exceed the increase in taxes.

500. Another indirect tax gaining momentum is the carbon tax. Carbon taxes are in place in nearly every large economy apart from Brazil and the United States.[369] The median carbon tax in 2016 was US$8 per ton of CO2 emissions, with wide variance across countries. Sweden charges US$130 per ton, while Poland charges US$1 per ton. In the European Union, the ratio of environmental tax revenues to total revenue varies from over 10 percent in Croatia, Slovenia, and Greece, to about 5 percent in Belgium and France.[370]

501. In 2014, Chile and Mexico approved the first carbon tax in South America, starting with modest levies—US$5 per metric ton of emissions in Chile and US$3.50 per ton in Mexico. Although Brazil does not have a carbon tax yet, it levies taxes on fuels. In 2017, Brazil increased the gasoline tax from 12 cents to 25 cents per liter and for diesel fuel from 7 cents to 15 cents per

liter at refineries. For ethanol, the tax rate increased from 3.8 cents to 4.1 cents for the producer, and 4.7 cents per liter for the distributors.

502. China and Korea have gone a different way: instead of imposing a carbon tax, they experimented with emissions trading systems in 2013 and 2015, respectively. China's emissions trading system covers traditionally high-emission sectors such as iron and steel, power generation, chemicals, building materials, papermaking, and nonferrous metals. Korea imposed caps on emissions from 525 of the country's biggest companies, creating the second-largest market globally. The World Bank estimates that China's emissions trading systems are equivalent to charging between US$7 (Beijing) and US$2 (Shanghai) per ton, while the Korean emissions trading system is equivalent to charging US$9 per ton.[371]

503. For a third source of revenue, governments can ensure that platform and superstar companies pay corporate taxes. This would mean charging platform companies taxes equal to what other companies are paying. This is rarely the case. Evidence has surfaced for several cases where companies use tax havens or direct negotiations with governments to avoid taxation. Regulators are investigating whether certain companies are getting unfair support in some cases. Amazon attributed more than US$7 billion worth of sales to the United Kingdom in 2013 but paid only US$6.5 million in tax. Apple has much of it's intellectual property located in low or zero income tax jurisdictions. More generally, the U.S. Government Accountability Office estimates that the tax code allows corporate deductions, credits, and deferrals to the tune of US$180 billion a year, or about 40 percent of the actual corporate income tax revenue. More than half of U.S. business activity, measured by sales, is conducted by pass-through entities, which do not pay taxes. It is estimated that almost half of multinationals' profits are shifted to tax havens, causing a loss of 12 percent of global corporate tax revenues.[372]

504. A fourth direction to raise government revenue is taxing immovable property. These types of taxes are relatively efficient since they do not distort labor markets, human capital accumulation, or innovation decisions. On average, high-income countries raise 1.1 percent of GDP from immovable property taxes. France, Japan and the United Kingdom relay heavily on them with revenues higher than 2 percent of GDP. In middle income countries, such taxes yield about 0.4 percent of GDP on average.[373] Countries like Georgia and Russia leverage them substantially.

505. Property taxes represent untapped revenue potential. This gap is estimated at an additional 2.9 and 0.9 percent of GDP in high and middle-income countries, respectively. China and Vietnam have moved in this direction. In 2010, Vietnam adopted a tax on non-agricultural land and is considering additional reforms. China may introduce a residential property tax in 2019.

506. In countries without clear property regulation and land cadasters, implementing property taxes is challenging. In Cameroon and Rwanda, for example, formally registered land constitutes less than 1 percent of total land parcels. However, limited registration capabilities have not prevented the use of specific property taxes in most of Sub-Saharan Africa. For instance, property taxes can be levied on leasehold rights like in Zambia or other types of limited property rights, such as concessions in Cameroon and the Democratic Republic of the Congo.[374]

507. Digital technologies are helpful in implementing these measures, such as digitalizing property registration in big cities. Such a step, when accompanied by rigorous enforcement of

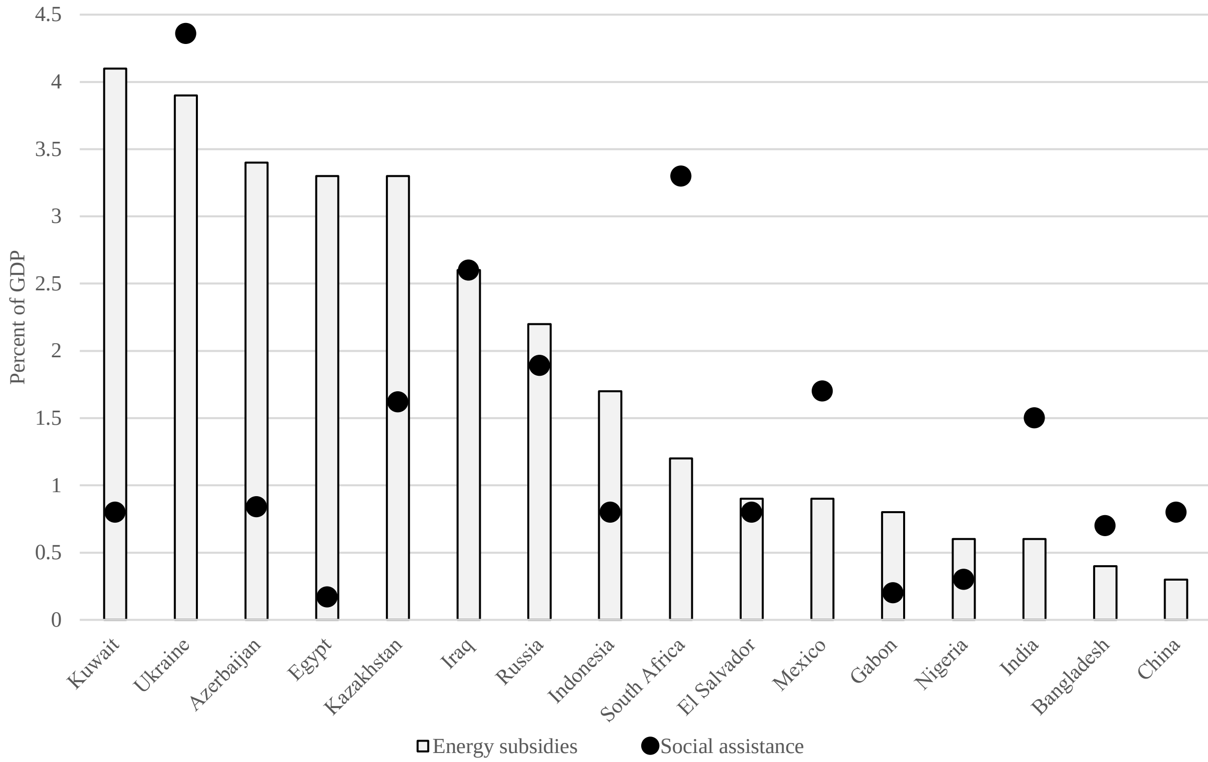
municipal tax collection, usually leads to a significant boost in revenues. For example, in 2010 the rate of collection of tax on urban immovable property in Lahore, the second largest city in Pakistan after Karachi, was one of the lowest in the world—at 0.03 percent of the state's GDP. The average for large cities in developing countries stands at 0.6 percent. The digitization of Lahore's property records in 2012-13 led to the addition of 1.7 million previously unregistered properties. Municipal property tax receipts increased by 102 percent by 2018.

508. While new sources of revenue are identified, it is also important to improve compliance with existing taxes. For example, in some countries VAT gaps are estimated to be large, such as 40 percent in Paraguay and Romania.[375] It may be too costly to eliminate all gaps between taxes due and collected; but improving compliance could raise significant revenues. In the early 2000s, VAT compliance gaps in Latin America were reduced from 35 to 25 percent, raising revenues by about 15 percent of GDP.

509. Tax compliance requires effective tax administration. Countries with more limited tax capabilities should put in place basic components like revenue authorities, technological infrastructure, and identification of taxpayers, including large corporate taxpayers and "hard-to-tax" segments such as high wealth individuals. As capacities improve, countries can take additional steps in broadening the tax base, ensuring comprehensive monitoring, and enhancing reporting. At more advanced stages, countries can benefit from a range of optimization investments in tax administration capabilities.

510. Finally, the elimination of energy subsidies represents a significant source of financing. In 2016, governemnt spending on those subsidies amounted to $262 billion.[376] In regions like MENA and Central Asia, as well as in East Asia, gains in fiscal space from dismantling energy subsidies could be substantial.[377] In many countries, their overall level is higher than public spending on social assistance, such as in Egypt, Nigeria, Indonesia, and Russia (figure 7.2).

Figure 7.2. Public spending on energy subsidies and social assistance (percent of GDP)



Source: Authors' calculations based on World Bank (2018e) and IEA (2017). Note: data refers to latest available estimates.

511. Reforming energy subsidies would have a dual effect. On one hand, energy prices may increase remarkably, depending on energy products. On the other hand, their removal would provide fiscal space for compensation and more efficient redistribution. Indeed, energy subsidies tend to be regressive. For example, in low and middle-income countries, only 7 percent of subsidies accrue to the poorest 20 percent while those in the richest quintile enjoy 43 percent of the benefits.

512. Despite political economy challenges, many countries seize the momentum of low international fuel prices to reform energy subsidies. Recent studies show that in 7 out of 11 reform episodes, commitments to reform energy subsidies were combined with an expansion of social assistance. These include, among others, Bangladesh, Egypt, India, Indonesia, and Jordan. In Iran, successful reforms were accompanied by the introduction of a near-UBI scheme.

Consultations and Timetable

513. Simeon Djankov and Federica Saliola are Directors of the 2019 WDR. The core team comprises Ciro Avitabile, Rong Chen, Davida Connon, Ana Paula Cusolito, Roberta Gatti, Ugo Gentilini, Asif Mohammed Islam, Aart Kraay, Shwetlena Sabarwal, Indhira Vanessa Santos, David Sharrock, Consuelo Jurado Tan, and Yucheng Zheng. Michal Rutkowski, Senior Director for the Social Protection and Jobs Global Practice, provides overall guidance.

514. The Board discussion of the Grey Cover draft is scheduled for July 12, 2018. WDR 2019 will be launched in October 2018.

515. The work on the WDR 2019 report does not rely on trust funds. The budget spent on drafting the study to-date is US$816,005.

Notes

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[274] Adhvaryu et al. 2013.
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[276] Caballero et al. 2013.
[277] Packard and Montenegro 2017.
[278] Bartelsman, Gautier and De Wind 2016.
[279] Bottasso et al. 2017.
[280] Brambilla and Tortarolo 2018.
[281] In the language of the World Development Report 2013, when regulations are outside of the "plateau". World Bank 2013.
[282] Sestito and Viviano 2016.
[283] The empirical literature, particularly on Latin America, suggests that wages often increase in the informal sector after a minimum wage hike. This has been explained as a "lighthouse effect" whereby the minimum wage is a signal for wage bargaining, including in the informal sector, or as a compositional effect as an increase in the minimum wage leads firms to substitute formal workers for informal ones (Boeri et al. 2011).
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[285] Kuddo et al. 2015.
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[287] Holzmann et al. 2012.
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[289] Krstic and Schneider 2015.
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[297] https://www.entrepreneur.com/article/286368
[298] Karabarbounis and Neiman 2014.
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[300] https://founders.archives.gov/documents/Jefferson/03-10-02-0390.
[301] Freund and Pierola 2015.
[302] Autor et al. 2017b.
[303] Goldberg et al. 2010.
[304] Cirera et al. 2018.
[305] Goldberg et al. 2016.
[306] Enterprise Survey, Employment Indicators Database.
[307] Freund 2016.
[308] Sundararajan 2016.
[309] The cluster of rural e-tailers is referred as a "Taobao Village" where 1) those e-tailers operate businesses within an administrative village; 2) annual village e-commerce transaction volume exceeds 10 million yuan (around $US1.6million); and 3) at least 10% of village households actively engage in e-commerce or there are 100 or more active online-shops, primarily with the use of Taobao.com Marketplace.
[310] 梁周倩, 姜雪芬. 2017. "淘宝村超 2100 个！农村电商已不是你想象的样子." 搜狐. http://www.sohu.com/a/209234546_114930

[311] This is a sum of various available statistics: 57.3 million in the United States, 1.4 million in the United Kingdom, 10 million in European Union, 15 million in India. These countries or regions are where freelancing is booming. The aggregated number reflects a sizable portion of the global freelancer workforce.
[312] Bento and Restuccia 2017.
[313] World Bank research finds that in Ben Ali's Tunisia, new firms were prevented from competing with companies connected to the President's family through restrictions on investment in certain sectors. Rijkers, Freund, and Nucifora 2017.
[314] Nightingale and Coad 2014.
[315] Djankov, Georgieva and Ramalho 2018.
[316] Haltiwanger, Jarmin and Miranda 2013.
[317] Bruhn 2011.
[318] Hsieh and Klenow 2014.
[319] Moscoso Boedo and Mukoyama 2012.
[320] Martincus, Carballo, and Graziano 2015; Carballo et al. 2016.
[321] Acs et al. 2017.
[322] Madsen 2007.
[323] Kenya Communications Authority 2017. Second Quarter Sector Statistics Report for the Financial Year 2017/2018 (1 October – 31 December 2017)
[324] Bloomberg Technology, *Go-Jek acquires three companies to dominate payment in Indonesia,* December 17th, 2017
[325] Filistrucchi et al. 2014.
[326] For details, please see https://www.w3counter.com/globalstats.php.
[327] Lenin 1918.
[328] Zucman 2015.
[329] Tørsløv, Wier and Zucman 2018.
[330] Beer et al 2018.
[331] Global Forum on Transparency and Exchange of Information for Tax Purposes 2017.
[332] Institute on Taxation and Economic Policy 2017.
[333] Beer et al 2018.
[334] Hebous et al. 2011; Griffith, Miller and O'Connell 2018.
[335] Karkinsky and Riedel 2012.
[336] Beer and Loeprick 2018.
[337] Beer et al 2018.
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[346] Fleming et al. 2016.
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[359] The level of international poverty lines used in the simulations vary by country income categories.
[360] Estimates for 2015 from the UN World Population Prospects 2017.
[361] The upper-bound cost would include a typical multi-program graduation package, the cost of which (i.e., $1,079) is calculated as the average from 6 developing country interventions (Banerjee et al. 2015); the lower-cost package is based on vocational training programs, the average cost of which (i.e., $831) is calculated from 8 developing country experiences with such schemes (McKenzie 2017).
[362] Given the lack of youth poverty data, the figure refers to the estimated global unemployment rate among youth in 2016, or 12.8 percent, which equals 135 million young adults in low and middle-income countries (O'Higgins 2016).
[363] IMF 2018.
[364] OECD/Korea Institute of Public Finance 2014.
[365] IMF 2018.
[366] World Bank 2017c.
[367] World Bank 2017d.
[368] Harris et al. 2018.
[369] Djankov 2017.
[370] Djankov 2017.
[371] Kossoy et al. 2015.
[372] Tørsløv, Wier and Zucman 2018.
[373] Norregaard 2013.
[374] Franzsen and McCluskey 2017.
[375] IMF 2015.
[376] IEA 2017.
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