

The Future of Work in Cities

Urban 20 White Paper

A contribution from Javier Sanchez-Reaza, Guillermo Alves and Lucila Berniell to the Urban 20 (U20)



About Urban 20

Urban 20 (U20) is a new city diplomacy initiative developed under the leadership of Horacio Rodríguez Larreta, Mayor of the City of Buenos Aires and Anne Hidalgo, Mayor of Paris and Chair of C40 Cities Climate Leadership Group (C40). Launched on December 12, 2017 at the One Planet Summit in Paris, the initiative is chaired by the cities of Buenos Aires and Paris, and convened by C40, in collaboration with United Cities and Local Governments (UCLG).

What U20 seeks, is to highlight the expertise of cities in a range of global development challenges and to raise the profile of urban issues within the G20. U20 will offer solutions and clear recommendations to national leaders for their consideration ahead of the 2018 G20 Summit. The first year of the U20 initiative will culminate in the inaugural U20 Mayors Summit in Buenos Aires, October 29-30. With this event, U20 will remain a stepping stone toward ensuring an ongoing dialogue between cities and the G20.

In 2018, 26 cities have participated in Urban 20: Barcelona, Beijing, Berlin, City of Buenos Aires, Chicago, Durban, Hamburg, Houston, Jakarta, Johannesburg, London, Los Angeles, Madrid, Mexico City, Milan, Montreal, Moscow, New York, Paris, Rio de Janeiro, Rome, São Paulo, Seoul, Sydney, Tokyo, and Tshwane.

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Urban 20 is proud to present a series of White Papers from our Strategic and Advisory Partners that highlight the most relevant topics on the cities development agenda and the forthcoming urban trends. These papers define the challenges that local governments are currently facing and offer open recommendations supported by relevant, up-to-date research and data. The intention of this work is to broaden the understanding and perspective of decision makers and stakeholders as to enhance their ability to tackle these most pressing issues. The White Papers also represent the hard work and dedication of these agencies and organizations to keep the public well informed about the ongoing efforts to address the present and future challenges we share as humankind.

Image Orbon Alija

The Future of Work in Cities is a White Paper prepared by subject matter experts from U20 Strategic Advisory Partners as a voluntary contribution to enrich the discussions of the Urban 20 process.

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Executive summary

Cities create jobs if they are successful in attracting both firms and workers. Firms are attracted to cities by the benefits they receive from sharing inputs, knowledge, and infrastructure with other firms; matching interests with numerous and diverse workers, suppliers, and customers; and learning from other firms and workers. Workers are attracted to cities by higher wages and the great variety of jobs and consumption opportunities.

Cities around the globe are experiencing the effects of several megatrends that are creating opportunities and challenges in job creation. First, demographic changes imply an aging population in developed countries and a rapidly growing urban population in developing countries. Aging in developed countries' cities implies declining labor supply and an increasing demand for jobs in health and personal care industries. Jobs in these industries can be an opportunity for migrants from developing countries. In developing countries, rapid urbanization implies the need for infrastructure to anticipate urban population growth. Expanding basic urban infrastructure, such as water, sanitation, and transportation, is not only essential for maintaining and improving urban residents' well-being, but can also be a source of job creation.

A second megatrend encompasses the impacts of technological disruption on cities' labor markets. The expected—although very much uncertain—shifts in demand for some types of human labor will likely eliminate some jobs while creating others. A key aspect of this transformation in labor demand relates to changes in skill requirements. Automation and artificial intelligence, while not necessarily reducing total labor demand, are very likely to change the mix of skills that will be in high demand. These changes in labor demand could worsen inequality. They imply a larger role for active labor market policies, such as employment services, training, and apprenticeships programs.

Beyond affecting labor markets, new technologies are also altering the traditional tools of urban policies and support opportunities for improving the quality of life in cities. The emergence of big data, for example, changes several aspects of urban policy, from the way cities collect taxes to the way they monitor urban expansion (satellite imagery) and transport and housing needs (GPS information on households' location and movements). Cities are important regulators of a set of new technologies affecting vital aspects of urban life, such as transportation (ride-hailing services) and housing (Internet-based, short-term rental apps). By adopting a proactive role toward these new technologies, cities can use them to improve both the quality of life and job opportunities.

Glossary

Agglomeration economies

Benefits generated when firms and workers are close to each other. Examples are the benefits from sharing inputs, knowledge, and infrastructure with other firms; matching of interests with numerous and diverse workers, suppliers, and customers; and learning from other firms and workers.

Congestion forces

Costs generated when firms and workers are close to each other. Examples are the increasing time-costs of urban travel, the increasing land prices affecting housing affordability, and the increasing pollution due to motorized transport and the emissions of some manufacturing activities.

Automation

The technology that allows a process or procedure to be performed without direct human assistance.

Active labor market policies:

Governments' efforts to improve the labor market situation for individuals who are out of work. Typical examples are programs that assist with job searching, as well as training and apprenticeship programs.

Introduction

Cities across the globe, particularly in G20 countries, will continue to experience the effects of several megatrends, first of which is demographic change. Some megatrends will affect urban labor markets, as the world's population is moving "through time" at different speeds. The developed countries are aging rapidly as developing countries enlarge their youth bulges. This polarization of demographics presents both opportunities and challenges. These demographic changes are accompanied by climate change, fragility, conflict and violence, and migration.

Second, the world's population is moving through space, as countries continue to experience further urbanization. Urbanization will soon be complete in developed countries, while developing countries will continue to urbanize. Cities in the developing world will feel the pressure to provide urban infrastructure and services to a growing population. How countries cooperate to meet each other's needs through migration will determine the outcome for G20 cities.

Third, cities will also face technological disruption, which is changing labor markets. The relationship between employer and employee is being transformed in many industries, as are the skills needed to be hired. Skills and innovation will be the key to jobs in the future, and services will demand highly skilled workers. Automation will eliminate many routine-task jobs, and artificial intelligence will transform jobs, if not directly replace many. But at the same time, automation will free up labor to pursue better paid jobs. Skills development, including reskilling and upskilling, will be key to overcoming labor market challenge. Finally, connectivity will continue to help consumers eliminate the asymmetry of information and intermediation, as well as enable technological transformation to work for equality for the vulnerable and for those living in remote regions.

These challenges require an active urban agenda on many fronts. Cities will need an urban policy that includes infrastructure that helps cities adapt to and mitigate the effects of climate change, provide affordable housing to a growing population, and use digital information efficiently for an agile response to changing conditions in the labor market.¹ Cities will also need to work on improving their business environment and seize the opportunities offered by newly available land. New technologies are also altering the tools available for urban policy. Big data, for example, changes the way cities collect taxes, monitor urban expansion, and understand transport and housing needs. Big data can also provide timely information on supply and demand for local labor. Cities will need to invest in these new technologies to operate more efficiently.

In this context, the future may hold as many opportunities as challenges for cities. This paper first lays out a brief conceptual framework on how to think about jobs in cities. The paper then describes each of the three megatrends: demographic change, spatial transformation, and technological disruption. While the meaning of these megatrends for cities at large, and for those in G20 countries in particular, remains uncertain, the paper sketches out some of the potential challenges and identifies some of the opportunities for cities in the context of a changing labor market.

¹ For example, communication technologies could increase work-from-home arrangements, reducing commuting and office footprints. It could also free land and real estate in prime locations.

Cities and jobs

A framework for cities and jobs

“Cities create jobs if they attract both firms and workers. Firms are attracted to cities because they can share inputs, knowledge, and infrastructure with other firms; match numerous and diverse workers, suppliers, and customers; and learn from other firms and workers. Workers are attracted to cities to enjoy higher wages and a large variety of jobs and consumption opportunities”.

These favorable attributes, referred to as agglomeration forces or economies, tend to increase with city size. But as cities grow, they may also develop some undesirable features that discourage the location of firms and workers and thus hurt job creation. These negative effects of city size, referred to as congestion forces, include the increasing time and cost of commuting as urban land becomes more expensive and rising air and noise pollution.

Job creation in cities results from the way cities manage the fundamental trade-off between agglomeration and congestion. For instance, attracting and retaining good workers requires investing in transport infrastructure to avoid high commuting costs, which make workers lose time they could otherwise devote to leisure or production. Similarly, having low commuting costs and affordable housing favors a numerous and diverse workforce, which benefits firms in both labor supply and customers.

Yet, urban areas confront a paradox. Cities usually concentrate wealth and employment opportunities in G20 countries. But they often host poverty and exclusion. One form of exclusion appears in the labor market. As land prices rise with the success of the city in attracting firms and workers, housing becomes less affordable. Poorer workers and member of other vulnerable groups locate in hazard-prone, improperly connected and serviced land that is farther away from job centers. Such a spatial mismatch between places of residence and jobs can be seen in cities from Chicago to Johannesburg. As a consequence, cities are places where wealth and poverty cohabit, where opportunity and exclusion coexist.

Megatrends that will affect jobs in cities

Demographic change

Aging will continue in high- and middle-income countries. According to UN population forecasts, the elder population will nearly double worldwide between 2015 and 2035 and increase fourfold by 2100. But aging will be concentrated in some countries. In 2015, less developed countries had almost twice as many older-age citizens (65 and older) than more developed countries. Growth in that population group will continue to be significantly higher in less developed countries (5.5 times the 2015 levels) than in more developed countries (1.8 times). But as a proportion of the population, the older-age group will grow more between 2015 and 2100 in developed countries (from 18 percent to 30 percent) than in developing countries (from 6 percent to 22 percent). While the share of older-age population will be the highest in OECD countries, the bulk of growth in the older-age population will be in middle-income countries: from

64 percent of the world's older population in 2015 to 71 percent in 2100.

The world's population will be divided into richer but aging economies and developing but young economies. Aging is not happening homogenously across the globe. Europe alone is home to one-quarter of the world's senior population. In the next three decades, older people will represent at least a quarter of the population on every continent except Africa. The richest parts of the world, along with middle-income countries, are expected to have particularly large shares of older residents.

Current high fertility rates in the poorest regions of the world will produce the youth bulges of tomorrow. As population growth in OECD countries stagnates—and contracts in some countries—the world's population growth will come almost entirely (99 percent) from middle- and low-income countries. Most of the population growth to 2050 will be in middle-income countries (58 percent). But the trends will be reversed thereafter, as nearly 80 percent of population expansion takes place in low-income countries. As Asia registers significant negative population growth rates, Africa's population growth will drive global trends, compensating for contractions in other continents. Northern America and to a lesser extent Oceania will register modest gains. Africa's engines of demographic expansion—accounting for nearly three-quarters of population growth—will be six countries in West Africa (Burkina Faso, Cameroon, Cote d'Ivoire, Mali, Niger, and Nigeria; 35 percent of global growth) and eight countries in mid-Africa between the Equator and the Tropic of Capricorn (Angola, Democratic Republic of the Congo, Kenya, Madagascar, Mozambique, Tanzania, Uganda, and Zambia; 39 percent). By 2100, 95 percent of population growth in Africa will be in Sub-Saharan Africa (table 1).

Table 1. Population projected growth by countries' level of development, income, and continent, 2015–2100 (percent)

Country and region	2015–30	2030–50	2050–2100	2015–50	2015–50
By development					
More developed regions	3	2	1	1	-1
Less developed regions	97	98	99	99	101
By income					
High-income countries	6	5	3	3	0
Middle-income countries	69	63	48	58	22
Low-income countries	25	32	49	39	78
By continent					
Africa	44	56	86	68	137
Asia	45	35	9	25	-34
Europe	0	-1	-2	-2	-4
Latin America and the Caribbean	7	6	2	5	-5
Northern America	3	3	4	3	5
Oceania	1	1	1	1	1
Sub-Saharan Africa (as share of African population growth)	88	90	93	91	95

Source: Calculations based on UN Population Forecasts in UN (2017a).

Workforce growth will be imbalanced too. In 2015, the world's workforce (population ages 15–64) stood at 4.8 billion people. More than a billion new workers will be added in the next two decades, reaching 6.1 billion—almost twice the current population of Europe or the whole population of China.² By 2100, 6.7 billion workers will make the entire global workforce. But the workforce expansion will be imbalanced. More developed regions will lose around 36 million workers in the next decade, and the loss will double by 2050 and more than triple by 2100. In upper-middle-income countries (Latin America, Middle East and North Africa, and Asia) workforce contractions will not be immediate but will increase dramatically after 2030. By 2050, upper-middle-income countries will lose nearly 110 million workers, and the loss could approach half a billion by the end of the century. Workforce expansion will be almost evenly distributed between lower-middle income countries and low-income countries, but 85 percent of those workers will be in Sub-Saharan Africa. Again, two regions will account for 91 percent of all workers in the world: Western Africa (Burkina Faso, Cameroon, Ivory Coast, Mali, Niger, and Nigeria) and mid-Africa (Angola, Democratic Republic of the Congo, Kenya, Madagascar, Mozambique, Tanzania, and Uganda).

Jobs will be needed. Meeting the challenge of workforce growth will require creating at least 40 million jobs globally each year. However, average job creation has been 2.5 million per year in the European Union since 2014, and 2 million in the United States since 2016. The remaining 90 percent of new jobs need to be created in the rest of the world. However, unemployment is already two times higher among Africa's youth than among its older adults—and four times higher in North Africa. The influx of workers is likely to exacerbate the challenge of youth unemployment.



Source: CAF

² This section uses UN population estimates from the 2017 revision in UN (2017a). Population growth figures for different regions and groups of countries come from UN (2017a), which uses median population estimates for 2015, 2030, 2050, and 2100. UN methodology to calculate population growth is based on the assumptions and methodology in UN (2017b). As admitted by the UN (2017b), there is inherent uncertainty in population projections since these depend on future trends in specific demographic variables such as fertility, survival rates, and mortality. The UN (2017a) dataset is based on medium-variant projections of the 2017 Revision, which assumes (i) a decline in fertility in countries where large families are present, (ii) a slight increase in fertility in some countries with fertility rates below 2, and (iii) an increase in survival rates due to a decline in mortality in all countries. Uncertainty was assessed using statistical methods to test a range of plausible outcomes for which the UN (2017b) argues there is a 95 percent certainty. Our calculations used the median values exclusively, but slightly higher or lower projections are also possible, as described in UN (2017b).

In developing country cities many workers rely on the informal economy for jobs. In most of Latin America's largest cities, youth employment in the informal economy ranges from 50 percent to 60 percent (CAF 2016). In Hawassa Town, Ethiopia, the informal sector employs close to 40 percent of young workers. Even under informal work conditions, young workers have acquired training and on-the-job experience, earn above minimum wage, have savings above the average for formal workers, and feel positive about their work experience (Darge 2015). However, the informal sector offers few opportunities for more advanced on-the-job skills development. Most informal occupations draw minimally on the skills that are relevant for labor market success, and skills that are not used can deteriorate rapidly. In Latin American cities, only one in six jobs in the informal sector requires high levels of cognitive skills, compared with one in three in the formal sector (CAF 2016).

Spatial transformation

“Urbanization has been a driver of development. The benefits of agglomeration provide incentives for firms and workers to concentrate in urban areas. Urbanization and the structural shift from agriculture to manufacturing, and now to services, have been some of the ingredients of growth. Urbanization enables structural change and leads to spatial transformation. Every country in the world has required urbanization to stimulate the productivity gains that lead to higher incomes”.

With the spatial transformation almost complete in more developed countries, **future urbanization will occur mostly in lower middle-income and low-income countries.** Spatial transformation will add nearly 2.5 billion urban dwellers by 2050, up almost 60 percent from today's 4.2 billion. The world's urban population share will expand from 55 percent today to more than 68 percent by 2050. However, nearly three-quarters of that urban growth will take place in middle-income countries, in particular in lower middle-income countries such as Cameroon, Republic of Congo, and Côte d'Ivoire. More than half of the world's urbanization will take place in those three countries. Low-income countries (such as Democratic Republic of the Congo, Niger, and Tanzania) will contribute less than one-fifth of the urban expansion.

Africa will urbanize, but at a rate much slower than its population growth rate, which may lead to international migration or to rural poverty. Sub-Saharan Africa will contribute to around one-third of the world's urban population growth. But its contribution to global population growth will be much lower than its contribution to global urbanization. By 2100, Sub-Saharan Africa will account for 85 percent of the world's population growth and 91 percent of its workers; by 2050, it will contribute only 34 percent to global urbanization. Whether workers born in Sub-Saharan Africa migrate to other countries or remain in rural poverty remains a question.

Migration can also be spurred by fragility, conflict, and violence. Economic migrants (those seeking employment and better living conditions) stood at almost one-quarter of a billion people worldwide up to 2018 (IOM 2018). Asylum applications to the European Union tripled between early 2014 and the end of 2016 (World Bank 2017). By 2016, the UN Refugee Agency estimated that nearly 66 million people were forcibly displaced. Every minute 20 people become newly displaced (UNHCR 2017). Fragility, conflict, and violence around the world could continue to

propel forced migration to other countries, including to G20 members. In 2016, the stock of refugees in the world stood at almost 18 million, which is twice as many as in 1980 and around nine times the 1970 level. In the European Union, the stock of refugees doubled between 2013 and 2016, reaching 2 million people.

Natural disasters are displacing even more people. Each year since 2008, an average of 25 million people were displaced by natural disasters (IOM 2018)—far more than the number of people forced to migrate because of fragility, conflict, and violence. These numbers could grow even higher as climate change affects the frequency and intensity of climatic events and as it rearranges economic livelihoods through drought and floods, making rural production economically non-viable in some places and forcing people to move to urban areas.

Technological disruption

The world is undergoing a fourth industrial revolution. Manufacturing took off in the late 18th century thanks to innovations in power (steam) and transport (railroads) that changed the way textiles were produced and output was shipped. A century later, mass production was enabled by electricity and the division of labor that gave the world light bulbs, telephones, and the assembly line. A third wave of industrialization took place almost half a century ago with the emergence of computers and information technologies. The current revolution is based on cyber-physical systems that are altering supply and demand patterns. These changes could be further fueled by the spread of 3D printing and the power to understand markets made possible by the collection of big data (WEF 2016).

“Through innovation, automation, and connectivity, technology is changing markets, including labor markets. New ideas and processes lower the costs and risks associated with new products. Some innovations lead to new businesses and jobs, while some spawn entirely new industries”.

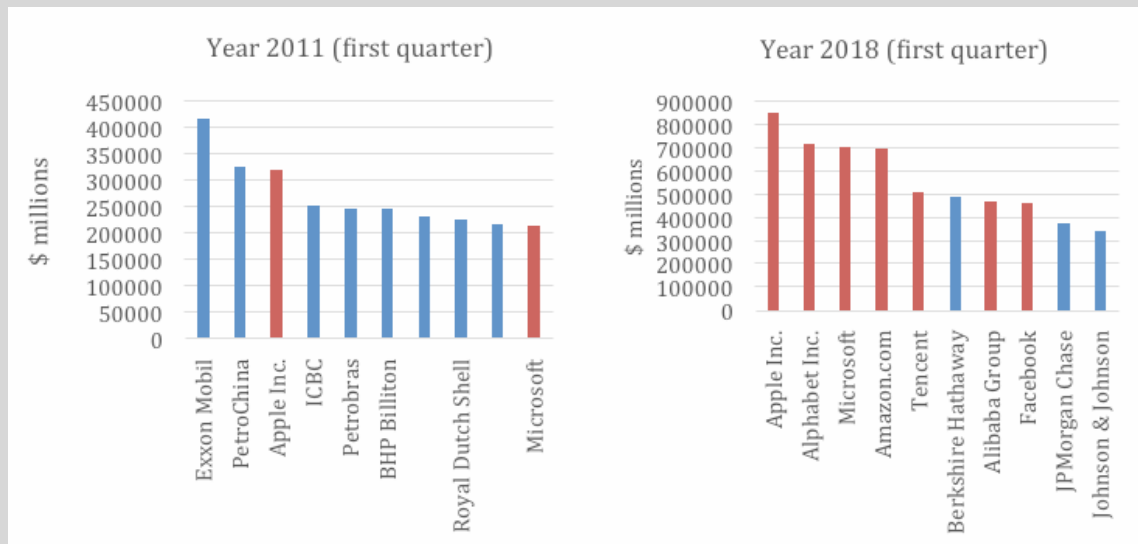
And some innovations have transformed industries, as the Internet and the emergence of streaming did for the music and film industries. Devices that are now taken for granted, such as smartphones, were not even in the market a decade or so ago! Similarly, connecting devices through technologies like Bluetooth and enabled by the “Internet of things” was not within our reach a few years ago. Connectivity changes the costs of transactions and in some cases can help firms achieve economies of scale, access resources, and reach old and new markets and create jobs to serve them. Perhaps no innovation has been as influential in its impact on labor markets as automation. Automation can eliminate some jobs and create others.

Recent technological innovations have changed entire industries. In the last few decades, significant changes in computing and communication technologies have profoundly altered productive and social organizations. Technological disruption is shaping new industries while affecting the production of more traditional goods and services. For instance, companies are moving their core business processes—such as accounting and sales—online. Platforms and peer-to-peer networks (AirBnB, Uber) are addressing the asymmetry of information between consumers and suppliers. The Internet is enabling better communication (email, video conferencing, Skype). Laptops, office software, and mobile phones have made work more efficient and productive and are replacing everything from music devices to encyclopedias.

Tech companies are gaining more relevance in the economy. Technological progress is

creating enormous economic benefits, as reflected in the recent (and dramatic) change in the composition of the list of publicly traded companies with the highest market capitalization (based on the Financial Times Global 500 rankings). Whereas in the first quarter of 2011, the 10 companies with the highest market value were mainly oil-related industries, only seven years later, in 2018, the list was populated almost exclusively by technology-based companies (figure 1).

Figure 1. Firms with the greatest market capitalization, 2011 and 2018



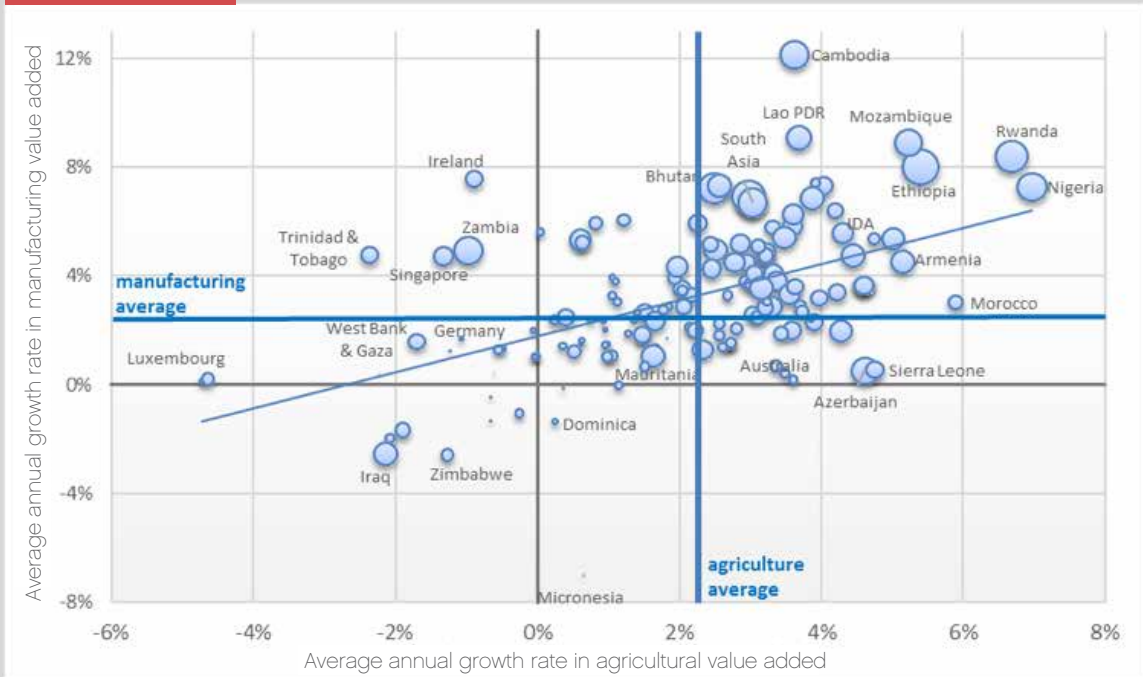
Source: Based on Financial Times Global 500 rankings [https://en.wikipedia.org/wiki/List_of_public_corporations_by_market_capitalization].

Automation is boosting the demand for robots. According to the International Federation of Robotics (2017), the operational stock of industrial robots increased 12 percent between 2015 and 2016. Demand has been so high that the worldwide stock of industrial robots doubled between 2008 and 2017. At an estimated annual growth of 14 percent, the stock will grow threefold between 2008 and 2020. The consequences of robotization are not entirely predictable. The effects will probably be localized in cities with large manufacturing firms engaged in activities that are routine enough to be automated (Acemoglu and Restrepo 2017).

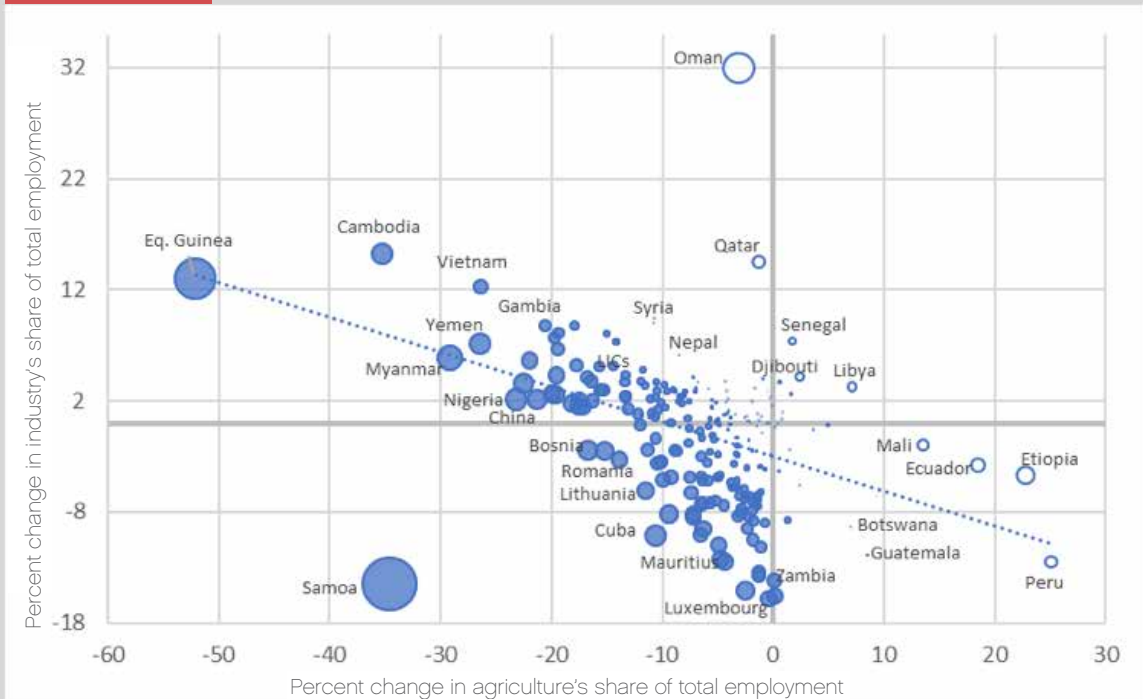
Structural change implies a growing role for services and the “servicification” of manufacturing. Technological progress has been occurring during a period of structural change: value added across sectors continues to grow (figure 2, top panel), but in most countries employment in both manufacturing and agriculture continues its secular decline as employment in services grows (figure 2, bottom panel). The United States and Latin America have both seen employment shift from agriculture and manufacturing into services (figure 3). At the same time, the line between manufacturing and services is becoming increasingly blurred by what has been called the “servicification” of manufacturing (Hallward-Driemeier and Nayyar 2018). Services are embodied in manufactured goods both during their production and when some final goods are used by consumers (for example, software and the apps needed to use some electronic devices). Cities like Austin, Boston, New York, San Francisco, and Seattle, among others, are leading in software and apps development, while Amsterdam, Berlin, London, Singapore, and Toronto are attracting software engineers that are developing the innovations that are leading to servicification.

Figure 2. Structural change in value added and employment

Value added

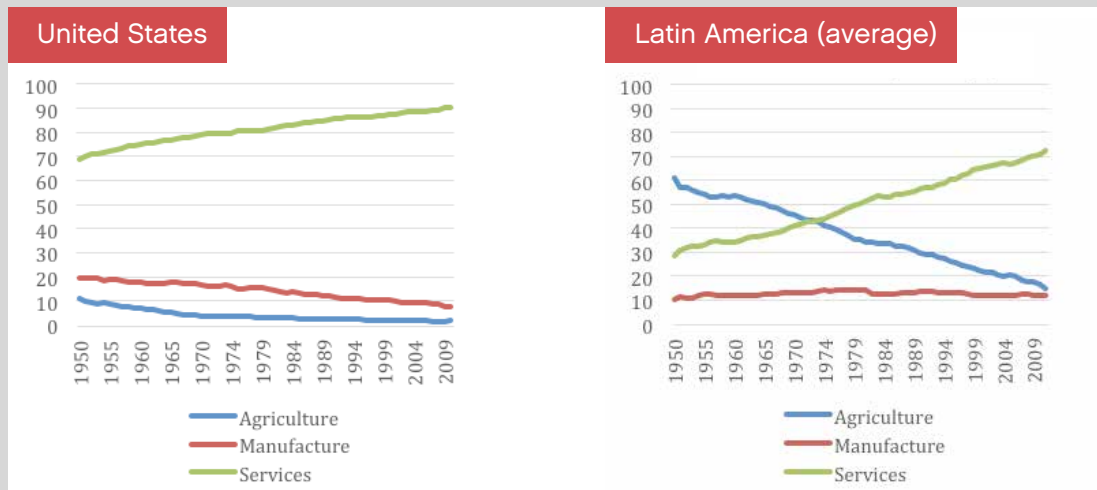


Employment



Source: Sanchez-Reaza (forthcoming).

Figure 3. Structural change in employment in the United States and Latin America, 1950–2015

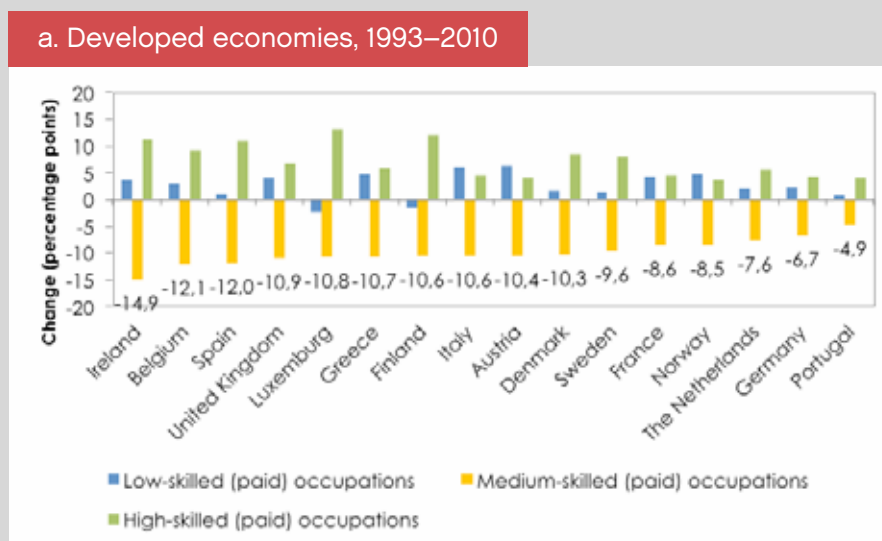


Source: CAF (2018).

This accelerated technological disruption of production also implies significant changes for jobs and workers. Machines now perform many tasks better than humans. This is particularly so for routine tasks, typically concentrated in occupations that used to rank in the middle of the income (and skills) distribution. This pattern of task automation is behind the job polarization seen in the last two decades in most developed countries (figure 4a), and somewhat less clearly in developing economies (see figure 4b for Latin America).

Robots are replacing workers, but technological change is estimated to have created many more jobs already. From 1999 to 2016, more than 23 million jobs were created across Europe because technology also raises the overall demand for labor (World Bank 2019). Technological progress leads to the direct creation of jobs in the technology sector, but it also introduces efficiencies in value chains that create other jobs (World Bank 2019).

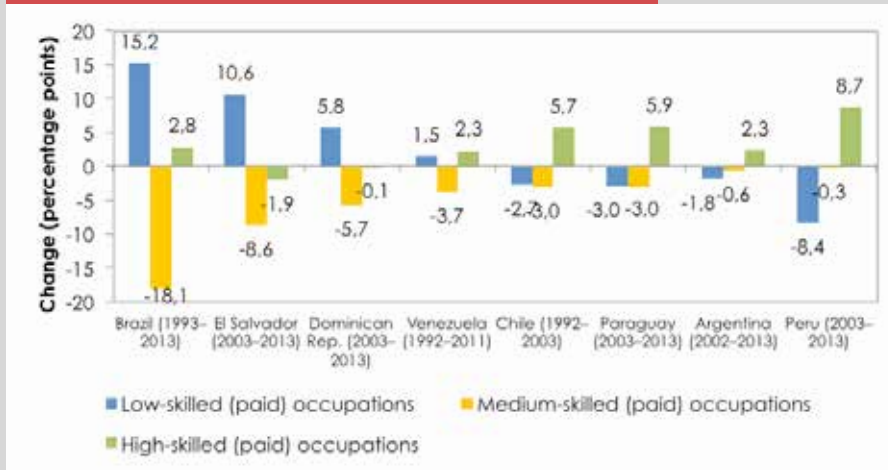
Figure 4. Changes in occupations' requirements



Source: Goos et al. (2014).

Note: Countries arranged in descending order by middle-skilled occupations.

b. Latin American countries (recent decades)



Source: CAF (2016).

Note: Periods are not strictly comparable. Countries arranged in descending order by low-skilled occupations.

In future, non-routine tasks could also experience transformation. Recent technological changes have affected mainly the automation of routine tasks. Recent advances in artificial intelligence and robotics could presage the possibility that machines will perform non-routine tasks as well. They already engage in many activities currently performed by humans, including speech recognition, identification of faces and objects, analysis of medical data, and direction of autonomous cars.

Technological advances will not necessarily reduce overall labor demand, but there could be a period of adjustment. Some pessimistic views on the impact of technological change on employment are based on the greater ease of anticipating which tasks are at risk of automation than of envisioning new tasks that will be created by new technologies. In addition, the productivity gains resulting from technological change can boost demand for labor in some sectors that lag behind in technological adoption, which can absorb some of the workers who are displaced by automation (Autor and Salomons 2018). Therefore, the expected—although very uncertain—shifts in demand for some types of human labor will likely eliminate some jobs and create new ones. Changes in skill requirements are a key aspect of this transformation in labor demand.

“Automation and artificial intelligence will not necessarily reduce total labor demand (in similar past events of intense technological progress, employment rose), but they are very likely to change the mix of skills that will be in high demand (such as socioemotional skills). These changes in labor demand and skill requirements could increase inequality”.

Although the balance in labor demand might be uncertain, the adjustment will take time and will require racing with, not against, machines (Chuah, Loayza, and Schmillen 2018).



Technological change has the potential to create jobs that we cannot now imagine under labor relationships that we do not yet fully understand. A recent report by Dell Technologies Institute for the Future (2017) predicts that 85 percent of jobs in 2030 have not yet been invented. In addition, the growing “gig economy,” with workers performing certain tasks without a permanent relationship with an employer, is disrupting traditional industries and changing the relationship between worker and employer.

Finally, faster connectivity could continue to be a force for progress. Connectivity through the Internet and mobile devices is opening markets, improving worker-job matches in the labor market, and extending the benefits of innovation even to poorly linked regions. Human mobility needs are increasingly being met through apps. Commercial malls are closing as people move their shopping needs online (Amazon, Ali Baba). Banks are also reducing the number of physical branches as people trust their mobile devices to take care of their financial needs. It could soon be hard to justify keeping a car, with technology bridging the asymmetry of information to provide mobility services when they are needed (Lyft, Uber). Increasingly, digital platforms are connecting vacationers with accommodations (Airbnb) and people with know-how and learning (YouTube), and personalizing the entertainment experience (Hulu, Netflix) and health care information (through wearables and Internet of things devices and platforms like MotherKnows). Digital platforms are also helping job searchers connect with new opportunities (Glassdoor, Indeed, LinkedIn). With the advent of blockchain, entrepreneurs can raise funds through crowdfunding using initial coin offerings and cryptocurrencies, eliminating financial intermediation. Finally, vulnerable populations can benefit from digital platforms to receive critical services—using digital IDs to access finance and services, or platforms like Healthify to find community organizations, social services, and government benefits. Similarly, the Internet and 3D printing could extend medical services, such as orthopedic solutions, to people in remote regions.

Megatrends’ impacts on cities—opportunities and challenges

Aging populations, youth bulges, and climate change could affect migration trends. As medical advances have extended longevity and fertility rates have fallen below the replacement level, populations in developed countries have been aging.

“An aging workforce means that developed countries will need to import labor from other countries or rely further on automation. Even in a scenario in which automation continues to replace workers in repetitive tasks, and artificial intelligence reduces demand for workers in non-repetitive tasks, demand for migrants will likely remain strong. Health care, mobility assistance, entertainment, and other services will continue to demand workers”.

At the same time, adverse climate events, which will likely intensify and become more frequent with climate change, will provide a migration push effect from areas prone to natural disasters. And G20 cities will require workers in fields related to adapting to and mitigating the effects of climate change.

Migration to cities will require working with market forces rather than opposing them.

Urbanization is the result of economies of scale in firms located in urban areas: as the firms become more productive, they pay higher wages, which attracts workers from rural areas. When policies limit urban sprawl, new business development, or the arrival of rural migrants, markets always find a way to get what they need. For instance, in the Republic of Korea, restrictions on setting up firms in Seoul have induced the private sector to locate just outside the core, driving economic activity to an area still close to the core and thus doing little to reduce congestion (Kamal-Chaoui and Sanchez-Reaza 2012). Rather than opposing urbanization, central and local governments need to focus policy attention on the market forces that lead to agglomeration and on congestion costs, such as land prices and diseconomies of scale that diminish residents' well-being.

Making the most of urbanization requires multi-level governance. Individual cities, particularly in G20 countries, can implement policies that make urbanization a positive force for development, from making infrastructure investment decisions that are also oriented to productive objectives to working with unions, education institutions, and firms to ensure that needed skills are being taught in the region. Cities can also ease the administrative costs of doing business in the region and revise planning regulations to avoid too much pressure on the cost and availability of housing. But in most cases, cities also need to have the institutional arrangements in place to coordinate investments, objectives, and mechanisms with other local governments (horizontal coordination) and for policies that feed into national objectives (vertical coordination).

National urban policy frameworks are also needed. With growing urbanization, national urban policy frameworks need to ensure that the objectives and actions of different ministries do not undermine or contradict each other. National urban policies need to become more forward looking. Urban policies have become more remedial (addressing negative externalities) than proactive (addressing negative externalities and fostering agglomeration economies). No longer preoccupied solely with regenerating declining areas, national urban policies and programs are creating large urban spaces capable of being nodes of production. Forward-looking programs are providing the high-quality urban infrastructure needed to attract mobile firms and their highly skilled workforces in the most innovative and dynamic sectors (Kamal-Chaoui and Sanchez-Reaza 2012).

Without significant action, youth employment pressures will grow. Stubbornly high youth

unemployment rates across the world are a prime concern for all countries. But the challenge is even greater for developing countries, many of which will experience the pressures of a growing youth population bulge. Initially, young workers in urban areas will demand jobs, but the challenge could be greater with rural to urban migration. Many governments in developing countries consider agriculture a part of their development strategy. However, better livelihoods in agriculture can be achieved only through productivity gains in farming. Introducing capital and technology to increase yields would reduce labor demand, which might trigger migration to cities. Urban areas in developing countries will be challenged to provide jobs for a growing youth population already in cities and those moving there from rural areas. If pressures lead to migration to developed countries, the youth bulges in developing countries could lead to more migrants moving to urban areas in G20 countries.

But cities can act on the supply side to reduce youth unemployment. A large component of the labor market is local. Despite global competition for talent, for the most part firms match job vacancies with local talent. On the supply side, city governments can support programs to equip future workers with the necessary skills, particularly in neighborhoods where they are most needed. New York City has focused on education in deprived neighborhoods. The Harlem Children's Zone aims to break the cycle of poverty by creating an enriching environment of college-oriented peers and supportive adults. It goes beyond investments in education to truancy-prevention programs, family counseling, community centers, job-preparedness, skill centers, and other programs to ameliorate the conditions that cause children to leave school or underperform. In operation for more than 40 years, the Harlem Children's Zone now serves more than 20,000 children and adults. Similarly, the City of London launched the London Challenge for primary and secondary school children, focusing both on inspiring children and on attracting teachers who can reach and motivate students. That same degree of local determination of training and education options is also needed in developing countries, where policies are often centralized and leave little room for local action.



Source: World Bank

Cities have also worked on the demand side and on improving job matching mechanisms. Policies are also important on the demand side. The London Apprenticeship Campaign, modeled on a program in the German state of North Rhine-Westphalia (home to Bonn, Cologne, Düsseldorf, and other large cities), subsidizes commuting costs for 16- to 18-year-old students on apprenticeship wages, improves perceptions about apprenticeships, and links students to college-level studies. Vancouver's BladeRunners program not only works to improve job skills among youth, but also links youth to local employers (Thomas, Williams, and Serwicka 2016).

Some decentralization of employment mechanisms to cities and local governments can also help. Public employment services work to reintroduce unemployed workers into the job market. Almost every G20 country has used such services to manage unemployment insurance, assist vulnerable workers, and help with job matching. However, most are national government programs operating at the local level. In the Netherlands, decentralization has improved outcomes. While national mandates through the public employment service (WERKbedrijf) set budget spending limits and goals, municipalities choose which in-house workforce reintegration services to offer or create their own (Weishaupt 2014). Decentralization offers flexibility to local governments to address specific local needs for economic specialization.

Aging is creating jobs in health care and personal care industries. Most urban areas in G20 countries are facing the prospect of aging populations, with associated rising demand for services in health care and personal care. At the same time, the youth bulge in developing countries may lead to increased migration to G20 cities. This confluence of forces can be win-win for cities, by giving migrants an opportunity to work in these growing industries while ensuring adequate care for aging populations.

Most urbanization will take place in developing countries, so the jobs challenge will increasingly be an urban challenge. Cities in developing countries will face the challenges of population growth and rural to urban migration. New urban residents will demand the expansion of basic urban infrastructure. That will improve agglomeration forces through education and knowledge creation while reducing congestion forces through better transport infrastructure and basic water and sanitation services. And building basic urban infrastructure, such as roads and water and sanitation facilities, can also be an important source of job creation.

“The impact of technological disruption on cities will depend on how well each city attracts and develops people with the key skills needed in the new labor market. Technological disruption that generates economic dynamism takes place disproportionately in sectors with a comparative advantage to develop in cities. Cities that develop these sectors will also have more dynamic labor markets”.

These sectors thrive in cities because of different types of agglomeration forces. First, innovation requires the exchange of knowledge and ideas, which typically takes place in cities. Second, these sectors require access to highly qualified workers, who also locate in cities. Third, these sectors require access to specific types of infrastructure, such as telecommunications, laboratories, universities, and research centers, which also cluster in cities.

Technological disruption may generate negative shocks in the labor market, but it also creates opportunities for cities to transform. Technological change can affect wages and unemployment rates in specific sectors. Workers in jobs involving repetitive tasks, especially in manufacturing, could lose their jobs to automation. But countering these losses will be the younger workers who will enter the labor market with new skills to fill jobs in fields that do not yet exist. Many of those jobs will require specialized skills, which could be expected to be well remunerated. Those new jobs will be located in cities that have amenities that are attractive to highly skilled workers—cities with urban spaces that favor the exchange of ideas, that help people nurture their personal and cultural interests, and that have high levels of livability. Those cities would also have opportunities for workers who provide services to those highly skilled

workers, thereby creating a space of opportunity for everyone. But cities have to work to put those amenities in place, to reduce or eliminate congestion costs (including pollution), and to attract and create the skills needed in the future. To improve on-the-job learning, cities would need to address business environment obstacles and resolve businesses' concerns.

New technologies also pose challenges and opportunities in traditional areas of urban policy, such as transportation and housing. For instance, the widespread use of smartphones with GPS and Internet connectivity have allowed new forms of ride-hailing services to emerge (Lyft, Uber). With these services and the advent of autonomous cars, some people are forsaking car ownership, which will reduce congestion costs and parking needs and free up land for other uses. Uber is testing its line of autonomous cars in 18 US cities, including Boston, Denver, Detroit, Las Vegas, San Francisco, San Jose, and Washington. The European Commission is also discussing the autonomous vehicles, particularly in relation to cybersecurity, liability, skills, data protection, and road safety. Some countries in Europe, such as Germany and the United Kingdom (London), are slowly allowing well-monitored public tests. Asia is moving faster, with cities like Singapore and Shanghai already testing autonomous vehicles. The delivery industry is also changing. In Mechelen, Belgium, tests of autonomous vans for deliveries have already been carried out. Trains are well into automation. Cities from São Paulo to Shanghai, Delhi to Tokyo, have some degree of automation on their metro lines. Kuala Lumpur has automated two train lines connecting the Greater Kuala Lumpur Valley, and several Korean cities, including Busan, Daegu, Incheon, and Seoul, have automated light rail lines and metro lines.

New technologies could reduce the cost not only of building new housing units, but also of running and maintaining them. Technology could lead to more affordable housing in cities if competition for input materials is addressed and if land and housing market constraints are eased (for example, zoning and other legal restrictions). At the same time, newly available land in cities (through reduced need for parking and other real estate) could be developed as affordable housing or as urban amenities to attract and host knowledge workers.

How cities address regulation influences their labor markets in two main ways. On one hand, these new technologies can be important sources of job creation at a time when new jobs are particularly needed. On the other hand, new technologies can help cities fight congestion forces and improve urban quality of life by favoring productivity and well-being, thus attracting more firms and workers. For instance, new transportation technologies can reduce road congestion and commuting times, while also cutting air pollution.

Finally, connectivity may reduce commuting needs. Greater use of videoconferencing through digital platforms (Skype, Google Hangout) and the spread of virtual reality technologies can make working across groups in different locations much easier. That creates incentives for firms to implement new working arrangements that require less commuting. Reducing commuting would improve air quality and increase leisure time for workers, leading to greater productivity and worker well-being. If firms embrace those new working arrangements, they might find it profitable to reduce their office footprint, releasing space for cities and firms to create new urban amenities to attract highly skilled workers.

RECOMMENDATIONS



Rethink active labor market policies

The rapid changes in the demand for skills imply a role for active labor market policies, such as job search and matching between firms and workers, as well as training and apprenticeship programs. These services, especially apprenticeship programs, have proven particularly effective for young workers.³ Cities can implement these policies directly or coordinate with national governments on adapting national active labor market policies to local labor market needs. As job matching in the labor market will increasingly take place on digital platforms, cities need to plan for the future and rethink their policies for the digital age.

Plan for livability to attract firms and workers

The quality of city life is increasingly important for attracting dynamic firms and qualified workers. In developing countries, cities must provide the basic infrastructure for enabling growth (water, sewerage, public transport) and attracting talent. Some cities in developing countries have an opportunity to get urbanization right and plan in a way that reduces congestion costs. Providing urban infrastructure and facilitating housing construction can both improve amenities and create jobs. New building technologies and materials can reduce energy consumption. By identifying idle land and easing restrictions on land markets, cities can also improve housing affordability. In developed countries, livability can be improved by addressing some of the negative externalities of agglomeration, such as pollution. Local approaches such as densification and compact cities, which reduce commuting times and carbon emissions, can enhance livability and address the challenges of sustainability. At the same time, cities must better understand the needs of firms to work more effectively with the national government to improve the local business environment and attract firms.

Formulate policies for skill formation

City's influence over formal education policies depend on the country's institutional framework. Education systems may need to change or adopt skill formation programs to meet new patterns of demand brought about by technological disruptions. Beyond formal education policies, which are often defined nationally, cities may have a greater role in training policies for the unemployed and for workers in jobs affected by technological disruptions. Since firms are interested in skills and not necessarily in formal education, cities may need to create new collaboration spaces with firms to encourage skills formation through partial salary subsidies,

³ See Card, Kluve & Weber (2010) for a general review of these policies and Manoli, Michaelides, and Patel (2018) for causal evidence on the effectiveness of a job-search assistance program. Attanasio, Guarín, Medina and Meghir (2017), Berniell and de la Mata (2017), and Ibarraran, Kluve, Ripan, and Rosas (2015) provide causal evidence on successful apprenticeship programs in Latin America.

provide apprenticeship programs that blend digital platforms with on-the-job training, and bridge the gap between the education system and firms' skill demands.

Apply new technologies to urban policy

New technologies are changing the tools for urban policy. The emergence of big data, for example, changes several aspects of urban policy, from the way cities collect taxes (data on property values), to the way they monitor urban expansion (satellite imagery), to how cities think about transport and housing needs (GPS information on households' location and movements). Cities can be both suppliers of these new technologies, by creating new tools themselves (for example by providing real-time online information of recreational, education, and health activities in the city), and users of technologies developed by the private sector (for example, by hiring a firm to create a new transport app for the city or by implementing a smart cities approach to service provision and congestion). Moreover, cities play a key role as regulators of new technologies affecting urban life, such as ride-hailing services and Internet-based, short-term rental apps.⁴ By adopting a proactive role, cities can use these new technologies to improve quality of life and job opportunities in cities.

Devise national urban policy approaches to address urbanization challenges and demographic change

Cities and national authorities need to develop a national urban policy framework for dealing with demographic change. Cities could begin a dialogue with national authorities to plan new migration frameworks that anticipate rather than react to demographic changes. Cities in developed countries will need to consider the effects of aging and the demands that retirees will make on urban services and infrastructure (for example, adapting modes of transport, planning for mixed land use to shorten travel distances, and adapting housing and transport facilities for reduced mobility). In developing countries, cities may need to prepare their infrastructure for young workers migrating to urban areas; planning for migration and getting policies right could change the flow of migration. Cities may want to discuss national urban policy frameworks with national authorities. Improving intragovernmental coordination to achieve a more integrated approach to national urban policy that takes into account cities' challenges is key to addressing demographic change.

⁴ The challenge of regulating these new technologies is illustrative of the more general challenge that cities face in terms of strengthening their institutional capacity to deal with the set of megatrends discussed in this document.

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