A New Work Society

After years of political debate and partly harsh resistance from the business sector, the people of Switzerland voted yesterday in a federal plebiscite for the adoption of the “Swiss New Work Society 2035”. Voter turnout was at record highs, with more than 82 percent of eligible voters participating in the ballot nationally, and 71.2 percent yes-votes announced in the official results. The adoption of the “Swiss New Work Society 2035” will have major ramifications for the Swiss economy and society. While the details need to be still worked out, the referendum obliges parliament to introduce a two-tiered universal basic income (UBI) together with a drastic reduction of regular working hours to 20h a week. The first tier UBI replaces and exceeds social welfare and has to ensure a sufficient basic income for each Swiss National. The second tier UBI is significantly higher but requires from each recipient to work on average at least 20h on an approved project or in a public or private organization registered with the Swiss Platform for Sustainable Development and Social Progress. The Platform hosts already more than 1900 initiatives and more than 4000 for-profit and not-for-profit entities. The selection and approval of entities to the Platform is administered by democratically legitimized committees, supported by scientific and ethics experts. Regular jobs and salaries in the corporate world are expected to exist in parallel. However, many business leaders warned that those private companies that do not fulfil the criteria for sustainable development or social progress would not be able to attract and retain enough motivated personnel anymore, despite higher salaries.

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1 Global and Regional Policy Shifts Shape Labour Markets in Europe and the United States

When we take a look at the current situation of global labour markets in 2030, it is not possible to start without remembering the crisis triggered by the coronavirus (COVID-19) in 2019/2020 (World Bank 2020; ILO 2020b; IMF 2020). Since then, remarkable shifts have taken place: Who would have thought that the European Union, which was at the brink of total collapse in 2023 would have managed to become one of the most attractive labour markets in the world? The United States, whose companies are still dominating much of the tech world, have gone through political restiveness and painful structural adjustments following the COVID-19 crisis. The economic importance of Asia has risen, but this ascent has been tamed by China’s global rivalry with the United States and with the West more generally, as well as the economic and political weaknesses revealed by the Chinese model (Pei 2020). In terms of labour markets, the United States and Europe now look much more alike than they did a decade ago. The United States has introduced stricter labour market regulation and has invested into its social security net, and the EU has promoted the mobility of its labour force and allows for more immigration. What is possibly most surprising in retrospective is that political and geopolitical decisions and not technological progress shaped the largest two labour markets.

Four key events change the global landscape with positive long-term effects
There are four key events that have brought us to where we are today, and all of them had the character of asymmetric shocks with respective policy responses. With unemployment rates in Europe (6%) and the United States (5%) now in more or less rapid decline since 2023/2024, we can say that this last decade has ended with rather favourable labour market conditions, and that the outlook for the next decade until 2040 is positive. Nevertheless, many of the political decisions that were taken in the past balanced on a knife’s edge and could have easily resulted in very different “job scenarios”.

The four key events are (i) the COVID-19 crisis and its devastating effects on labour markets (Fig. 1), (ii) the near-collapse of the EU in 2023 and the joint declaration of its members in Strasbourg in December 2023 (see also Box 1), (iii) the escalating geopolitical crisis between the United States and China in 2021/2022 and the formation of the U.S. Global Strategic Alliance in 2024, and (iv) the “New New Deal” in the United States that finally passed Congress in early 2024.

1.1 But First, a Virus Brings Turmoil and Change

Since the initial COVID-19 crisis about 10 years ago, we have become used to dealing with various mutations of the virus during annual flu seasons with—fortunately—overall limited effects on public health. During the first 2 years after COVID-19, regional and temporary outbreaks of the coronavirus still raised fears. Yet, the public response would never again reach the scale of the public health
measures taken in 2020, as the social and economic costs in the first half of 2021 rose exponentially. Since the introduction of several vaccines during 2020, global public interest in the coronavirus has vanished completely today. Nevertheless, the COVID-19 crisis has had a crucial and long-lasting impact on the geopolitical order and the world of work (Fukuyama 2020). The crisis acted as a trigger, as a game changer, as well as an accelerator or decelerator of several megatrends that have shaped global labour markets.

First, the COVID-19 crisis and the implemented countermeasures by most governments triggered the most severe recession in decades with unemployment rates reaching unprecedented levels (OECD 2020; ILO 2020b). During the 2010s, fear of job losses was originally strongly focused on the impacts of artificial intelligence and further automation (Frey 2019; McKinsey Global Institute 2017). It turned out that the virus, directly or indirectly, destroyed many more jobs in a shorter period than was predicted machines would do under the worst-case scenarios. Second-round effects of the COVID-19 crisis led to debt crises across the globe (Kose et al. 2020), the bankruptcy of several states, and in consequence, political and social crises, which ultimately also brought the European Union to the brink of collapse and to its “moment of truth”. In the United States, the weakness and inadequacy of social welfare was bitterly exposed as many people fell out of the labour market, lost their health insurance coverage, and many ended in poverty (Garrett and Gangopadhyaya 2020). Due to this lack of automatic stabilizers, downward trends during the recession accelerated, inequalities became more severe and fuelled the already pervasive political polarization. Both developments, spiking
unemployment rates and the socioeconomic impacts, led to major political reforms that have shaped—and in fact realigned—the structures of the two labour markets, as we discuss in more detail below. Finally, today’s geopolitical rivalry between the United States and China was also fomented by the COVID-19 crisis and contributed to the “bipolar multilateralism” in which we live now. One aspect was the partial de-globalization (Irwin 2020), manifesting itself in shorter and more diverse supply chains, whereby fewer and fewer companies maintain significant supply chains into China or into the Chinese sphere of influence. Another aspect of this bipolar world is the difference in technical and sociopolitical standards. For example, since the COVID-19 pandemic, there is a widespread acceptance in the Chinese hemisphere that digital tools and big data have to be used for surveillance purposes of different kinds while the United States-dominated hemisphere has developed complex regulations to ensure data privacy and limits the use of data to certain domains.

What can be said about the COVID-19 crisis in retrospective is that the long-term impact on public health was limited in all affected countries. But COVID-19 triggered the recession in 2020, and the short-term public policy response led to structural fiscal policy shifts that have had many (often negative) long-term effects. The COVID-19 crisis also accelerated several trends like increased digitalization, automation, e-commerce, and remote work (see also Fig. 3), and most importantly, it triggered policy and sentiment shifts in the EU and elsewhere that had many societies questioning their work cultures.

Box 1 The Strasbourg Declaration of the EU (2023)

- The EU makes a declaration in 2023 confirming its intent to transform the EU into a Federal Union of regions. The 750 European regions receive a high degree of economic autonomy and political decision-making power legitimized through regional plebiscites. The importance of the national states shall be reduced, direct participation of EU citizens be increased. After several years of preparation for the new political process, each region starts this year (2030) to vote and send a directly elected regional representative to the European Parliament. This new parliament then, together with the nationally elected governments of member states, jointly appoints the European Commission.
- The EU decides in Strasbourg on the creation of a significant joint fiscal budget for defence, the environment, and migration.
- New EU regulations leave much more liberty to national and regional regulations by becoming promoters of minimum standards on a large

(continued)

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1Bipolar multilateralism describes a geopolitical system in which economic, political, and military power is concentrated in the United States and China but none of them is capable to exert global influence without temporary or strategic alliances with more or less independent middle powers like the EU, Gulf Cooperation Council, Russia, India, Brazil, the African Union, and others.
variety of issues. Citizens’ groups can submit initiatives for regulations to the EU Parliament, and EU citizens can participate digitally in the voting process on such initiatives.

- Old and newly created EU institutions in Brussels are directly accessible to all EU citizens. National institutions as intermediaries shall lose importance.
- A new EU social security system is being created, which diversifies risks across the Union, facilitates and promotes labour mobility across regions. Social security claims are easily transferable. The common, dynamic EU labour market shall become a major attraction for global talent.

1.2 The Promises of Automation Have Been Fulfilled and Disappointed...

At the beginning of the 2020s, the discussion about job losses and the risk of sustained high unemployment rates centred around technological developments in the area of artificial intelligence (AI). Concerns existed among policymakers, academics, and others that such inventions would be used on a large scale to replace human labour and to automate work processes (Frey and Osborne 2017; Brynjolfsson and McAfee 2014; Brynjolfsson and Mitchell 2017; Lee 2018; PricewaterhouseCoopers 2017). The first lesson of the past decade was, however, that COVID-19 and the major recession had destroyed many more jobs than AI was ever predicted to do. Aggregate unemployment is not determined by technology, and automation was neither the most decisive megatrend on the European nor the North American labour market, nor did the developments evolve linearly. One of the most common traps in predicting the future is to look at current trends and to extrapolate them linearly, without taking interactions with other megatrends into account. This clearly happened with some of the predictions on AI and its expected impact on labour markets: Today we know that the adoption of AI and robots is particularly useful in aging societies with a shrinking labour supply (Acemoglu and Restrepo 2018). Societies can always find useful activities for displaced labour in other sectors (Bessen 2018), and the increasing complexity of our societies constantly creates new tasks and new problems that we would not be able to solve without computers and AI (Simon 1965). Nevertheless, AI has played an important role in transforming labour markets globally by accelerating other developments and by opening opportunities to do things in the world of work differently.

...whereby many jobs have been transformed but not displaced

A quite useful illustration of the transformation of labour markets through digitalization and AI is the matrix depicted in Fig. 2 originally developed by Fossen and Sorgner (2019). Categorizing occupations in four quadrants according to the
dimensions “destruction” through AI and “transformation” through AI, we observe that many actual jobs were in the quadrants I, II, and IV. Thus, most jobs were indeed strongly affected by technological advancements in AI. There are only a few jobs in Europe and the United States that were not touched by digitalization (Quadrant I) at all. Most jobs in category I come from the craft and artisan sector or from areas in which the human component of the work is essential, as for example, barbers, masseurs, opera singers, professional athletes but also decorators, carpenters, or cooks have been jobs in the human terrain. In those jobs, there is either simply a preference for a human worker over a machine, or the technical possibilities of AI were overestimated, or the implementation of AI was economically not viable at the given labour cost.

In most other occupations, we did indeed observe a strong impact of AI, in particular, in the vast majority of professions that use large amounts of data and utilize AI to analyse data to facilitate decision-making. But in contrast to what many expected, very few occupations disappeared entirely and change happened at a much slower pace than anticipated. Examples of those jobs that have been reduced on a large scale are cashiers in supermarkets, sales representatives, or security guards (IV). Very often, jobs that exclusively consist of transactional tasks, or gathering and transmitting information, or computing as well as memorizing, archiving, or identifying information with large amounts of data have been replaced or significantly been reduced in numbers.

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Fig. 2 The transformation of jobs. Source: Fossen and Sorgner (2019)

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2Fossen and Sorgner (2019) measure the destructive effects of automation on the horizontal axis by using the “risk of automation” by occupation as developed by Frey and Osborne (2017). The transformative effect of each occupation is measured by the AI Occupational Impact (AIPI) score proposed by Felten et al. (2019) on the vertical axis. Each occupation can therefore be depicted as a point in the x-y-plane with those occupations that are strongly affected by both dimensions of AI in quadrant II.
But for the vast majority of jobs, we can say that work today involves much more interaction of humans with machines, sometimes with machines acting as an interface between humans or between human tasks, and sometimes with humans acting as the interface between devices or machine tasks. Physicists, medical doctors, lawyers, statisticians all belong to category I as they can use AI to augment their activity spectrum. In the division of labour, human activities have often shifted towards overseeing and controlling machine activities or towards interpreting or validating machine output to be used as further input for human activities in the work process. The concept of a “job” has become more unstructured in a way, and some people have suggested that the whole idea of an “occupation” may become obsolete. We may be at the point where we can get rid of what Frithjof Bergmann (2019) called the “job system”, in which we coop human work in boxes called “jobs” that are being traded on the market. The variety of tasks performed by different people in the same occupation has increased and changes much faster than it did in the past, and computers are today more often involved in carrying them out.

...and AI more often enhances humans than replaces them

At the beginning of the 2020s, there were some overly optimistic expectations on what AI is actually capable of doing in the future, for example, in terms of autonomous driving or as a recruiting tool in HR. Some of these hopes were exaggerated. AI applications have indeed become indispensable tools in human resource management and recruiting (see also the section on labour market institutions and the new work and hiring culture below or Chap. 13 in this volume), but they still do not take independent hiring decisions. With regard to autonomous driving, what we observe today in the automobile sector is that many companies have given up their driverless vehicle programs (for level 5), at least for vehicles targeted for private customers. Marginal costs to achieve fully autonomous vehicles simply exceed what customers are willing to pay. Google’s Waymo, which is one of the few companies that has continued their autonomous vehicle program, just announced that they expect to have a fully autonomous vehicle on the roads in California by 2032 (a prediction that Elon Musk has repeated for Tesla annually at least since 2015 (Matousek 2020; BBC News 2020)).

Yet, there have been visible successes in the development of autonomous driving over the past 10 years, especially in the logistics sector. Several German highways, for example, have a separate lane for autonomously driving trucks, and around the world, specially designated areas like airports, university quarters, or ski resorts operate entirely with autonomous vehicles. Professional drivers of vehicles belong to the “collapsing occupations” (IV) of Fig. 2, and the number of jobs is declining in

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3Many experts warned already more than a decade ago that artificial general intelligence (AGI) was probably centuries away rather than decades (Brooks 2019; Lee 2018) but also weak or narrow AI has had its failures (Strickland 2019).

4Level 5 vehicles do not require any human attention or action under any circumstances and hence drive fully autonomously.
absolute and in relative terms (as a share of all employed). However, large-scale job losses have not occurred and drivers are still needed, partly with new responsibilities. For security reasons, there is always at least one operator required for every two consecutive trucks, even though the operator does hardly any driving except for emergencies. Similarly, autonomous driving in specific contexts is not entirely “autonomous”. Some municipalities in the United States have successfully started employing autonomously driving school buses, but there is always a supervisor onboard. How could some people in 2020 have thought that we would let a bus full of unattended minors drive through the city without any adult?

1.3 The Composition of the Workforces in Europe and the United States Has Changed

The workforces in both regions, the United States and the European Union (EU-30), have become more heterogeneous and more mobile. This is a trend that is likely to accelerate over the next decade. First, due to aging populations, the labour force as a whole has started to shrink slightly, in particular in European countries. In the United States, the labour force increase has levelled out. Hence, this decade has reversed a trend that we have seen for centuries in advanced economies; the supply of labour is not increasing anymore, or it is even decreasing.

Second, the median worker is now 47 years old in European countries and 45.1 years in the United States. So more than half of the labour force in both regions is beyond the so-called prime-age of 45, after which participation rates typically decline. This latter trend, however, has been reversed: Participation rates of the older cohorts have risen in both regions, together with female participation rates that continue to increase. The aging of the labour force has been slowed down in the EU through new liberalized and coordinated immigration policies. These policies have allowed the EU to attract younger talent, in particular from non-EU Eastern Europe (Russia), North Africa, and Central Asia. On the contrary, stricter immigration into the United States, initially triggered by the Bush Administration and drastically accelerated by the Trump Administration, has drained the American talent pool. As a result, for the first time in history, Europe is reaching a mobility of labour within the EU that is approaching that of the United States’. The share of non-EU born citizens who reside and work in the EU and the percentage of EU citizens who work in an EU country other than their home country is at record high. European workers are also three times more likely to accept a job offer that is more than 250 km away from their current domicile than they were 10 years ago. Besides modernized immigration policies, this increased mobility of Europe’s labour is also a result of a cultural shift of the working population towards a European Federation. The younger generation especially appreciates the opportunities of the EU’s open national borders (Shell Deutschland 2019) and has pushed for its further integration.
Other decisive policies introduced by the European Commission (EC) after 2023 included the transferability of social security claims of workers between Member States, and a renewed focus on the reduction of language barriers through education and cultural exchange. The abolition of a mandatory retirement age in many European countries as well as labour laws enabling a variety of forms of part-time work have further contributed to heterogeneous labour forces in terms of age, gender, ethnicity, language, and other socioeconomic characteristics. This labour force of 2030 will have diverging expectations and perceptions on the meaning of jobs, careers, compensation, and fairness. The workforce in the United States has always been more heterogeneous than most of Europe’s. It has continued to change over the last decade (Deloitte 2017) even though stricter U.S. immigration rules have noticeably slowed down the trend to more diversity.

1.4 and With a More Diverse Workforce, People’s Aspirations and Expectations at the Workplace Vary

In consequence, both regions have today a diverse, and more innovative labour force, which is part of the reason why managing work processes in companies has also become so much more complicated than 10–15 years ago. Much more time is being spent on coordination and harmonizing personal expectations within teams and with expectations by the general public. These more complex working relationships are also a reflection of the new work culture (Bergmann 2019), in which people’s aspirations to perform meaningful work determine the tasks and not vice versa. Many organizations today, public and private, attempt at least, to reflect to some degree this new work culture.

The dissolution of the traditional physical workplaces in many sectors (see Fig. 3), including in many services like law, medical examinations, fitness classes, and many others, completes the picture of a “decentralized workforce”: decentralized in location, in time, in possession of information and decentralized in decision-making. Working together with a group of people (colleagues) for a specific organization (employer) has become a much more fuzzy undertaking: More project-oriented work towards customized outcomes has meant more fluctuating working times for many. Some in the group work only part of the day, only on certain days of the week, or only during certain times of the year, and possibly even for different organizations at the same time. The “default place of work”\textsuperscript{5} is often not determined by the work output, as more and more work can be performed “remotely” and is effectively carried out in the virtual space.

For example, it is not unusual today that medical doctors examine patients, advise them, and even perform surgery without ever having met their patients physically. To illustrate how dramatic this change is, let us compare such a diverse team with a group of shift workers in the 1970s in the automobile industry: Each worker knows

\textsuperscript{5}This is the place or location where the work would typically be expected to be carried out.
precisely where to be and when, and which hand movement they have to do at which time. Most likely, he is male and knows all his colleagues around him pretty well. All colleagues have a similar educational and cultural background. They know exactly when their work activity is over, and they may remain in this work context for a long time, if not forever. Becoming already less frequent over the last decades, we have now been moving away from such structured working environments at lightning speed in the last few years. Today, unstructured working environments are the new normal. Individualization that we observe at several societal levels (Beck 2016) also occurs at the workplace.

1.5 Agile Organizations and Well-Educated, Resilient Individuals Deal Best with Unstructured Working Environments

The unstructured working environments described above are characterized by higher degrees of uncertainty, decentralized information, and changing objectives. Small, agile organizations in technology sectors (e.g. information technology, bio-tech) with their highly talented workforces have proven to be the most successful players in this environment. Hierarchical and bureaucratic organizations, on the other hand, which function best in a well-structured environment with centralized knowledge and top-down approaches in decision-making, have had difficulties in maintaining their performance over the last years. Several large, traditional companies in manufacturing sectors (automobile, mechanical engineering) have lost competitiveness due to inefficient organizational structures. Rapid advances in digital technologies and AI over the last 15–20 years have enabled us to manage and efficiently organize these more complex work environments. Without these
technologies, we would have never been able to create such a productive, versatile, and innovative workforce. But not all organizations have been successful in implementing these technologies effectively.

1.6 Signs of a Brain Drain in the United States Emerge and More Immigration Helps the EU

The United States has recently started reversing restrictive immigration laws that had been subsequently implemented under political pressures during the first quarter of this century. The United States had and has become more European in this regard, that is, less open to immigration. In contrast, the Europeans have become more American, finally acknowledging their role as a “country” of immigration, especially after the EU’s 2023 Declaration. With a certain time lag, innovative hotspots in the United States, like California (Silicon Valley) or New York, have felt the drain of international talent. The number of start-ups has gone down, and it has been harder for fast-growing organizations and companies to find highly qualified personnel. Still, many of the new digital technologies come from Silicon Valley, and the adoption of new technologies appears faster in the United States. Europe has caught up, less in the number of start-ups than in their quality (i.e. their potential). Several high-tech companies and non-profit organizations were founded and have been growing in European hubs like Berlin, Paris, Barcelona, Geneva, or Amsterdam.

Finally, Europe has managed to play on its strengths: a high-skilled labour force, high quality of living with good social security systems, and relatively low societal inequality. What was missing in the first two decades of the twenty-first century were opportunity and scale: the opportunity to embrace new technologies and new ideas, and to scale them up to functioning organizations that improve the well-being of society. The “new” EU has started promoting a faster adoption of new technology and new forms of work. The EU Directorate-General (DG) for “New Forms of Work and Social Progress in the Digital Society”, which has its counterparts in several national ministries,6 started operating in 2028.

North America has not quite caught up on raising the skill level of the general working population to the same level of Europe even though it remains a point of attraction for very high-skilled labour. The same gap remains for social security, despite the massive expansion of the social security system and funding of higher education through America’s New New Deal (2024). The polarization of the workforce, the proportion of uninsured people, and the level of income inequalities in the United States are still high.

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6For more details, see the discussion on labour market institutions below.
1.7 It Is Not the End of Manufacturing and It Is Not All About Services

There are fewer jobs in classical manufacturing, but still about 6–15 percent of the labour force in most advanced economies work in manufacturing, compared to 8–20 percent about a decade ago. Hence, due to automation, employment shares have further declined, continuing a trend since the 1970s and 1980s. Yet, this decline has not accelerated as many predicted (see Hallward-Driemeier and Nayyar 2018), and “smart” production has also led to the creation of jobs in the sector (PWC 2017).

Much of today’s manufacturing focuses on the customization of high-quality products that are to be produced with as little natural resources and as little energy as possible, preferably with a recyclability rate of more than 90 percent (Rosa et al. 2020). Most production facilities are small shops rather than large factories and they are operated by independent, small organizations. The days of standardized mass production and one-time use products are over. This has required more automated and more sophisticated production with highly skilled workers. Many tasks that are carried out, and many devices that are employed today in manufacturing originate from the environmental goods and services sector (EGSS) and the high-tech sector. These are smart, small machines that are capable of producing customized output with little resources and hardly any waste. If we now count these latter jobs as being part of the manufacturing sector, we would even see a slight increase in overall employment numbers. The EGSS sector and related services have also been drivers of exports, whereby Europe, together with China, is leading world markets. Other sectors that have expanded particularly in the United States and Europe are the health care sector and personal services, the IT sector (United States), and construction (United States and Europe).

AI has strongly impacted three sectors over the last decade with visible consequences for jobs: First, the growth of jobs in the services sector has been decelerated through AI and been somewhat disappointing. Some jobs in public administration, the insurance industry, finance, accounting, and legal services and others have been transformed by AI, but many tasks, and with them, administrative jobs, have been automated. Often, those automated jobs were not the most popular ones, and many people today feel happy that they are gone, but we did see a reduction of numbers in these services, which were once the big hope to replace manufacturing as engines of job growth. Traditionally, exhibiting low-productivity growth, the construction sector is a surprising star of the AI revolution and has received a remarkable boost through the widespread use of new technology (Roland Berger 2020). The design, renovation, and project management of building and infrastructure construction has seen enormous efficiency gains and an increase in demand.

Finally, not being a sector in itself, we have observed public–private partnerships mushrooming since the early 2020s, most of them not organized as profitable corporations, but as part of the “New Work Deal”, enabled through digital platforms.
1.8 The Climate Crisis Remains Unresolved

If we look back at another megatrend, we have to admit that global climate change has had a much more limited effect on labour markets in advanced economies than many had thought. Turning to labour markets in Africa and Asia (see below), however, shows that the effects of climate change and climate change policies on the economy have been much more pronounced than anticipated. The main reason for this development is that mankind has to date failed to combat global climate change. Despite half-hearted efforts to mitigate greenhouse gases (GHG), global emissions have reached new heights every year with the exception of years hit by global recessions, in particular, the year 2020 (Fig. 4).

The EU’s and the U.S.’ global share and their absolute amounts of carbon dioxide emissions have been declining. However, this has not been the case for emerging regions like China or India and for most other regions around the world, which have managed at most to prevent further increases or to slow down annual increases. By and large, the last 15 years have shown that climate change mitigation measures have failed on a global scale. Fossil fuel reserves remain abundantly available, and new reserves have become available in now ice-free areas. Today, we expect an increase in average global temperatures of about 2.0 degrees by 2050 and of 3.7 degrees by

![Annual Total GHG2 Emissions by Region, 1920 - 2030](image)

**Fig. 4** Annual GHG emissions in tons by region, 1920–2030. Source: Carbon Dioxide Information Analysis Center (CDIAC) and author’s estimations
2100. The different pathways do not predict dramatic differences until 2030, and indeed the worst is still to come in the next decades with the average impact from global climate change still limited today. Yet, on the regional level, we can already see sharp contrasts: Europe has seen several dry summers and more extreme weather events, but adverse effects on GDP and labour markets are hardly visible. The United States also had to suffer from extreme weather, whereby some states were much more severely affected than others. California, Nevada, but also parts of Colorado, New Mexico, and Texas have endured draughts with negative consequences on agriculture and overall living conditions. These conditions have triggered a certain degree of labour migration within the United States. Other parts of the world, such as South Asia or Africa, have endured already more significant consequences on labour markets.

1.9 and Policies Have Shifted from Climate Change Mitigation to Climate Change Adaptation

These developments and disappointments with mitigation have led to a policy shift. Climate change mitigation policies have been significantly scaled down. The bulk of climate policies around the world today are adaptation measures. Such measures include “classic” policies like afforestation, or flood management, and land recuperation at the coasts, but also significant advances have been made in climate engineering. The biggest trends today in climate engineering are CO2 removal and solar radiation management. Carbon dioxide is also increasingly used as a resource to generate a large variety of synthetic products.

Nevertheless, efforts to reduce CO2 emissions are also still relevant, and technological innovations have been made to increase the efficiency of consumption of the resources used. Today, Europe has the technological lead on the production, logistics, and commercial use of hydrogen fuels (European Commission 2020). In combination with increasing exports of solar energy in the form of hydrogen from the Gulf States, we are today at the edge of having an economically viable alternative to a fossil fuel-based economy. Hence, there still exists a chance that global CO2 emissions will decline in the second half of the century.

The European Green New Deal7 was revised in 2025. Many of the policies are still relevant, but the focus on the 1.5-degree target and specific emissions reductions have been given up. Original emissions reduction targets of the transport sector are out of reach. We now have a higher tolerance towards allowing higher emissions (less mitigation) and a stronger focus on adaptation (Nordhaus 2018). The labour market effects of climate change and climate change policies (including other environmental policies) are limited but visible. Except for job losses in the EU’s fishery sector due to overfishing, the direct negative effects from environmental damage have not yet materialized. We have seen positive employment growth in the

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7The European Green New Deal was launched in 2019 (see European Commission 2019).
European environmental goods and services sector (EGSS). The sector employed about 4.7 million people or roughly 2 percent of the European labour force in 2020 (Esposito 2017), and it has grown to more than 7 million workers or about 3 percent of the labour force as of today.

1.10 Occupations and Products That Increase Resource Efficiency Are Globally in High Demand

This increase is remarkable because the growth of the EGSS had slowed down significantly in the previous decade and was mainly driven by subsidies in wind and solar energy. Many of these jobs turned out to be temporary and not sustainable. By contrast, recent job growth has been driven by high-tech engineering jobs in recycling, water supply, and wastewater management but also in the “classical” manufacturing sectors. In these sectors, chemical and mechanical engineers have revised existing processes and invented new ones to increase resource efficiency in all production processes. The European hydrogen strategy has also sparked job growth in the EGSS, transport, and manufacturing sectors. European companies are today leading globally in most environmental technologies. European know-how and exports are in high demand in many emerging and developing economies that struggle with providing their growing populations with a satisfying infrastructure under shrinking natural resources. Forty-one of the global 50 megacities are located in emerging or developing economies (ESPAS 2019), and only three cities are in Europe (London, Paris, and Moscow). But European know-how is used in managing resources in almost all large cities. The European EGSS has become an attractive and well-paid employer for engineers around the world.

1.11 Most Traditional Labour Market Institutions Do Not Yet Support More Frequent Transitions

Many trends have evolved faster than public institutions have changed. For example, by and large, public education systems in Europe and the United States are still designed to prepare students for a one-time-for-life occupation, even though job-to-job transitions have accelerated over the last years. In particular, digital technologies continue evolving fast, and the increased focus is on resource efficiency in many production and consumption processes together with more complex working relationships. This means that people are and have to be more flexible in their careers and in the roles they assume. Technical knowledge needs to be updated or acquired, but also social competencies need to be continuously adjusted.

While the “classic” educational institutions such as schools, universities, or apprenticeships have not changed much over the last decade(s), possibilities for on-the-job training have expanded considerably, for example, through e-learning and digital devices. People can participate much more easily and cheaper in customized training. Switching careers, having more than one career at the same
time, or changing industries, organizations, and occupations has become easier but remains difficult. We are still not in a labour market that is in line with people’s aspirations and societal goals. We only just started understanding in which direction our institutions have to change (OECD 2019). So what have we learned and what needs to change?

The traditional Central European approach of a broad-based general education has proven to provide a sound foundation for lifelong learning if combined with practical vocational training for adults, for example, in community colleges or institutes of technology like in the United States. An engineer benefits his whole life from a strong education in mathematics or programming when learning new skills later on during his career, or when pursuing an entirely different occupation. Europeans have opened up to the idea that adults can formally re-educate themselves several times during their lives, and the United States have invested more resources to provide high-quality foundational education to a broader share of their population. Foundational education establishes the capacity to know-how-to learn and is not targeted at a specific occupation. But institutions on both sides of the Atlantic have fallen short of transforming into something new, mainly due to unresolved questions about financing.

1.12 But Data, Platforms, and AI Have Revolutionized Talent Management with Many Opportunities

The most significant innovation in labour markets institutions in the United States and Europe—and elsewhere in the world—over the last decade was undoubtedly the systematic inclusion of AI in search and matching processes8 and in talent management (“people analytics”) more generally (Garg and Ahluwalia 2019). Originating from HR practices in the private sector in the early 2020s, these algorithms have found their way into public employment agencies and public policymaking. Meanwhile, based on recent advances in natural language processing (NLP), AI identifies people’s capabilities better than humans and also often makes better predictions about people’s success in new roles. Without downplaying the difficulties that AI solutions in HR still had in the early 2020s and sometimes still have, we can claim that times in which HR specialists manually went through CVs and attempted to make ad hoc predictions on who is a good fit for a job belong to the past. Finding the right people to collaborate with, facilitating job-to-job transitions, or transitions from out of the labour force into the labour force are much easier and targeted than ever before. AI has opened up many opportunities for workers and enterprises in the labour market.

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8That is the matching of labour supply (job seekers) and labour demand (job vacancies).
1.13 and Some Risks

The main problems of these AI tools in HR, namely, discrimination and biases, as well as a “preference for averages” rather than outliers, have been well documented and partly addressed through new technical solutions and better collaboration of these systems with human HR experts. In fact, AI can also help to overcome human biases and create a more diverse workforce, which is correlated with the profitability of organizations (McKinsey 2018). A broader policy discussion has evolved around the question of who runs the talent platforms, where the data come from, and who owns the data. Originally, for-profit tech firms in the United States drove the evolution of AI-based talent management. They transformed hiring practices in the corporate world during the early 2020s. But in the United States, this led to a “segregated talent market” where predominantly high-skilled workers willingly shared their private data with these private platforms, and private corporations also shared their vacancy and HR data and were willing to pay high prices to find the best talent. Smaller and medium-sized companies have neither a sufficient amount of systematic HR data to be interesting data suppliers for people analytics nor do they have the financial means to pay the high fees of private talent platforms. So, in the United States, and partly also in Europe, we have seen a polarization of jobs and incomes as well as a division between larger firms who have access to top talent and those who do not.

1.14 A New EU Labour Market Institution Uses New Technologies to Promote Policy Goals .

The European Union has reacted with an innovative approach and with the creation of the EU Directorate-General (DG) for “New Forms of Work and Social Progress in the Digital Society”, which functions as a digital European employment agency and has stored more than 2 billion CVs and billions of vacancies, respecting recent changes to EU data protection regulation. The data include CVs of potential immigrants to the EU who are looking for employment opportunities. The trained AI, which is globally the best talent management tool, communicates with affiliated companies’ HR systems and ERP systems. This infrastructure will be connected to EU universities and other training institutions in the future. Only in operation since 2028, the system has already proven to increase occupational mobility and to identify previously unforeseen career paths thereby helping enterprises to find the right talent. Its services are open at low cost to all institutions with a permanent establishment in an EU Member State.

What makes this new EU institution unique are not only its technical capabilities, but it is also its sizeable budget. It handles the new EU lifelong learning accounts, which are personalized accounts financed through social security contributions that can be further complemented with subsidized loans. This financial aid enables any person to choose to stop working and to retrain or re-educate herself at one of the accredited institutions. Hence, the financial incentives combine elements of a
universal basic income with active labour market policies. Another unique feature of this new institution is that it is not only matching job seekers with existing vacancies, the AI also suggests transitions and collaborations across individuals based on their work preferences and their capabilities. The AI suggests vacancies, or more generally, work opportunities. The institution has therefore given birth to a variety of new work collaborations, profit or non-profit, in the form of start-up firms or others that go beyond the classical “corporate framework” and are more aligned with the “new work culture” (Bergmann 2019). This new EU institution has only been operating for a bit longer than one-and-a-half years and it is too early to evaluate its overall success. But so far it has already (i) increased career mobility for all, (ii) raised productivity of the workforce, (iii) facilitated new forms of work collaborations, (iv) enabled lifelong learning and agility of the workforce, and also (v) raised wages across the board, as the competition for talent has become more fierce. These developments can be the first steps toward a future of work in which we will work without jobs (Jesuthasan and Boudreau 2021).

1.15 ... But Has Not Yet Finally Clarified Who the Social Partners in the Digital Society Are

The new directorate has also emphasized its passive role in terms of determination of labour market structures, hence signalling that the more active role can remain with the social partners. Traditional (Kampeter 2019) and new social partners have been integrated into the directorate’s working environment. While the popularity of traditional trade unions and employer associations have continued to decline, new work coalitions have emerged that are organized about labour market “issues” rather than industries. They often started as digital grass-root movements. For example, the “equality at work” group is concerned with gender equality in the world of work and has more than 400,000 individual and corporate members in the EU. Another example is the “reduction of working time group” that is developing and advocates new working time schemes with the purpose of an overall reduction. These new work coalitions sometimes, but not always, work collaboratively with the traditional social partners. All of these groups are involved in the standard-setting rules for the further development of the AI in the directorate, but it remains to be seen to what extent the social partners from the industrial society and the ones in the digital society will resemble each other.

2 The Difficult Rise of Asia and Africa’s Struggle

Europe and the United States have managed to seize many opportunities over the last decade. This second part of the chapter looks at how other parts of the world, like Africa and Asia, who have been exposed to the same megatrends, have gone through labour market transformations. Some of the previous considerations, such as job displacement through AI or climate change, also apply to Asia, Africa, and
other parts of the world. Still, some developments were specific to these regions. Starting with a general observation, we have seen that developing economies have had much more difficulties with coping with changes triggered by the various megatrends than advanced economies.

### 2.1 Between Automation and Rural Economy

In Asia, we can observe this divide between developing and more developed economies. For example, China has been continuing its economic rise—albeit at decelerated pace—while many developing countries in South East Asia like Vietnam, Thailand, or South Asian economies, like Bangladesh or Pakistan, have struggled to catch up in their economic development. The COVID-19 crisis functioned as a game changer across the globe. Labour markets with high informality rates and underdeveloped social protection systems were especially hit hard (Díez et al. 2020). As discussed in the first part of this chapter, the crisis at the beginning of the 2020s had accelerated the journey to a “bipolar multilateral” world with China and its increased geopolitical power as one of these poles. The rise to more economic power has been more challenging than expected; especially, the impact of de-globalization has reduced China’s growth and its links to the West. The political and economic divide and political differences within Asia are clearly visible, with countries like India, Japan, South Korea, and Indonesia gravitating stronger towards the United States pole.

In its manufacturing sector, China has seen a wave of automation, thanks to its continuously growing technological capacity (Lee 2018). With rapid technological change and an aging population as major trends, the Chinese labour market is actually exposed to very similar challenges as its Western competitors. But there are also important differences: First, China still had a large rural population around 2020 with about 40 percent or more than 500 million people living in rural areas, compared to about 20 or 15 percent in countries like the United States or Germany. Most of China’s rural population depends on working in the primary sector, where income and education levels are significantly below that of urban populations. These inequalities, as well as automation of agricultural activities (towards industrial agriculture), have raised constant migration pressures from rural to urban areas. Yet, a classical development path was barred (Lewis 1954), as the capacity of China’s manufacturing sector to absorb large masses of low-skilled labour have been limited by labour displacement through automation and slower expansion of the sector due to shrinking exports. The migration pressure is exacerbated through climate change damages and environmental pollution (McKinsey 2020). Heat waves and water shortages have made subsistence farming in several regions impossible.

China’s government has reacted with an expansion of subsidies and business incentives for the service sector. The service sector keeps expanding rapidly, and advances in AI technologies have created many new business models and new enterprises. Then again, automation of routine tasks has reduced the speed of new
job creation. In sum, the service sector is in turmoil with new jobs emerging and other jobs disappearing at the same time. Together with the influx of low-skilled job seekers from rural areas, who cannot find employment, this has led to an increase in informal employment relationships in urban regions. China has a relatively well-developed social security system, but digital labour platforms and gig work are common tools in the service sector and have undermined formal working relationships. Thus, the Chinese government has found itself in a dilemma. On the one hand, new job growth in the service sector is urgently needed, at least until the demographic aging effects fully kick in at around 2050, and so are the many innovative tech companies that have sprung up in great numbers all over in China’s urban centres. On the other hand, only a minority of the new jobs are of good quality in the sense that they are well paid, stable, and provide social security. Many jobs are temporary, offer limited possibilities for career advancement, and are not covered by formal working contracts. So it is questionable at this stage to what extent many of these jobs contribute to a long-term development strategy.

The creation of good, new jobs has been more successful in China’s expanding EGSS sector. New technologies, new products, and new services have been developed over the last 5–10 years that are targeted at taming the resource hunger of the world’s largest economy and at reducing environmental pollution and degradation. Smart Chinese megacities are an example for urban planners around the world, and resource use per inhabitant has been reduced by 70 percent since 2020. Some expertise in resource efficiency and environmental technology is still imported from Europe, but China has developed its industries and gained expertise in these areas. This know-how is being successfully exported into many developing and emerging economies in Asia or Africa.

2.2 The Demographic Dividend Has Not Yet Paid Off for India and Others in the Region

The point of departure for labour markets in South Asia in the early 2020s was in several aspects different from China’s. India, for example, has a growing, young population and had prospects of attaining a demographic dividend in its effort to boost GDP per capita growth. Income per capita in India was also about four to five times lower than in China, and this gap has virtually remained the same as of today. India was less affected by de-globalization over the last decade, given that India was much less integrated into global trade to begin with. The labour market effects of de-globalization have been more severe for countries with strong links to global supply chains, like Bangladesh, Vietnam, or Cambodia. They have seen job losses and worsening working conditions in sectors like textiles.

We have also seen similarities in facing labour market challenges across the whole of Asia: The region has the largest percentage of the population affected by natural disasters. For example, the negative impacts of climate change have increased migration pressures for low-skilled workers and have accelerated urbanization in India and elsewhere. The employment share in the Indian agricultural
sector has fallen rapidly from 50 to 30 percent within a decade. Heat waves have made many forms of subsistence farming impossible, from an economic perspective but also from an occupational safety and health perspective (McKinsey 2020). This trend is likely to continue throughout 2050. The construction sector was an important net creator of jobs in India, especially for low-skilled workers. Climate change and worsening working conditions for those working outdoors have reduced the possibility of the construction sector to absorb large numbers of workers and to provide good quality jobs.

The speed of automation in manufacturing has been very modest, due to the abundance of cheap labour in India and many other Asian countries. However, quicker-than-expected adoption of new technology took place in India’s agricultural sector: Automation, artificial intelligence, drones, harvesting robots, and recent advancements in biotech have kept agricultural productivity in India rising, and these devices are less vulnerable towards heat and air pollution than humans. But this development has meant a shift away from low-skilled, labour-intensive production methods in agriculture towards capital-intensive production operated with high-skilled labour. India, like many other Asian countries (ASEAN +6), still lacks skilled workers to work in non-routine cognitive occupations (ILO 2019). This substantive skills mismatch in the middle of a large structural transformation became apparent to most policymakers in the mid-2020s as structural unemployment and informality rates started spiking.

Many governments, including India’s, have reacted with extensive education and re-skilling programs for low-skilled workers that have lost their jobs in agriculture or light manufacturing (Deloitte 2019). But given weak institutions in most developing countries in Asia, and given the long times that it takes for investments in better education to pay off, much of the unemployed have ended up as informal platform workers in Asia’s crowded megacities. The need for much higher resource efficiency also applies to India’s megacities, but India is much more reliant on importing solutions and services from Europe or China. India has managed to develop high-tech industry and is specialized in IT services, a sector that provides a decent number of good and well-paid jobs in urban centres. The potential of job growth in the sector has been limited by the slow growth rates in global trade and services. The failure of the international community to agree on any form of services agreement, either on the regional level (negotiations of The Trade in Services Agreement (TiSA)) have been broken off in 2022) or on the multilateral level have further reduced growth rates.

2.3 Africa at the Crossroads

A technological laggard, Africa has become a harvesting ground for tech companies to take advantage of cheap labour for data entry, tagging, and training samples for AI (The World Bank 2019). Several large cities across Africa, like Lagos or Addis Ababa, host a sizeable community of African entrepreneurs and start-ups that have also created employment opportunities for Africa’s tech-savvy youth. New digital
payment systems have constituted additional revenue streams for digital companies in advanced economies. The average ICT intensity of jobs in South Africa has continued increasing over the last decade, while more than 30% of all formal sector employment in countries like Ghana or Kenya occur in occupations with high ICT intensity. Several African countries have benefited much more from the platform economy than other developing countries. The lack or weakness of physical infrastructure and institutions has often limited the access of entrepreneurs to bigger markets. Platforms like Amazon and others have created many opportunities in consumer markets or the supply of intermediate goods or means of financing. The wide dissemination of smartphones in African countries let entrepreneurs and customers easily participate in networks. A growing economy and a larger number of entrepreneurs have had a positive effect on the overall number of jobs outside the agriculture sector. Yet, neither is global growth strong enough (Chap. 1) to spill over to developing countries, nor are enough well-paid jobs being created.

The informal sector in Sub-Saharan Africa, which typically has the lowest levels of productivity, accounts for a sizeable proportion of employment (90 percent of total employment in 2020). It has remained large but shrunk to about 65% over the last decade. Efforts to formalize farms and firms have benefited from digital technologies that have offered opportunities to enhance their productivity. For example, better connectivity has helped small firms to access credit or insurance products, or to train their workers very effectively through e-learning. Thus, Africa’s labour markets have taken advantage to some degree of digital technologies, but the biggest holdback is the lack of education for large parts of its workforce (WEF 2017). Sub-Saharan Africa still has one of the lowest numbers of years of formal education globally while being one of the world’s youngest regions. The continent’s working-age population has increased to over 600 million, and the number of available jobs is simply not sufficiently high to provide jobs for everyone.

Few megacities have lifted themselves off the ground, partly by integrating international trading networks, often fostered by China’s Belt-and-Road initiative. Links with the rest of the economy remain weak, however, as the lack of infrastructure and education prevent a gradual diffusion of wealth throughout the countries. Africa is also highly vulnerable to climate shocks. Climate change has started eroding the livelihood of populations in semi-arid and arid zones. Widespread poverty has fuelled internal migration, urbanization, and continuously high fertility rates with simultaneously growing mortality rates and repeated famines.

Remittances remain an important source of revenue for many households who continue to send a large share of their youth to work in foreign countries. Many African countries have gained from the new migration policies of the European Union that allow for temporary and permanent work assignments within the EU.

3 Reflections on the World of Work in 2030 and Beyond

After a devastating start with the COVID-19 crisis in 2020, labour markets across the world have experienced a rather positive decade. What many did not expect is that advanced economies would see a strong come back, and developing countries have
not managed to close the development gap, neither in terms of GDP, nor in terms of well-being on the labour markets. Another surprise were the renewed strengths of the old continent and the United States. A crucial insight of this chapter is that political decisions shape labour markets. For example, the EU emerged stronger at the end of this decade than in 2020, providing more opportunities to its citizens and to migrants from other regions. But if other political decisions had been taken this would not have been the case. The same is true for the United States, China, and others. Another insight of this chapter is that the impacts of digitalization and climate change on labour markets were not as strong as many anticipated. These impacts will most likely be much more pronounced in the coming decades leading us to 2050.

Disclaimer The future of work scenarios developed in this chapter are a fiction. They have been created on the basis of available information in early 2020 and on the basis of the author’s perspective on the world of work. In particular, none of the political events or declarations referring to the time period after 2020 have actually taken place. The scenarios are neither predictions nor desired future outcomes. They are solely meant to inspire critical thinking about how known developments today (2020) could evolve into a possible future in 2030. The author is a senior economist and researcher at the Research Department of the International Labour Organization (ILO) in Geneva. Any view expressed or conclusions drawn represent the views of the author and do not necessarily represent ILO views or ILO policy. The views expressed herein should be attributed to the author and not to the ILO, its management or its constituents.

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