

Chapter 2. The economy and labour market

This chapter presents some characteristics of the political, geographic and demographic context of Mexico. It examines the key features of the economy, with a focus on the country's strategic industries, and the labour market. The chapter briefly discusses the most important economic and labour market challenges at national and state levels, also in light of future developments. The chapter concludes with implications for knowledge and skills needs and more specifically for the labour market relevance of higher education.

Political context

Mexico is a democratic federal republic with 32 states. Each state is further divided into municipalities. The administrative capital of the country is the recently constituted state of Mexico City (a federal district until 2016).

The Mexican Constitution establishes the separation of powers between the executive branch (the President of the Republic at the federal level, governors at the state level and presidents at the municipality level), the legislative branch (the Congress, constituted of two houses: the Senate and the Chamber of Deputies), and the judiciary branch (the Supreme Court of Justice, the Council of the Federal Judiciary and the Electoral Tribunal at the highest level). There is a multi-party political system in which the president is elected every six years by simple majority popular secret vote, without the right to re-election.

At the federal level, the Secretariat of Public Education (*Secretaría de Educación Pública*, SEP) is responsible for Mexican public education at all levels, and the Sub-Secretariat of Higher Education (*Subsecretaría de Educación Superior*, SES) is in charge of higher education. The states also have responsibilities for primary, secondary and higher education, which are regulated by the state secretariats of public education and their sub-secretariats or directorates of higher education.

Geographic context

Mexico is a large country, with a territory of around two million square kilometres and a coast line of 9 950 kilometres, making it the fourteenth largest country in the world. It shares borders with the United States to the north and Guatemala and Belize to the south. The 32 Mexican states differ greatly in size. Chihuahua and Sonora are the largest states, covering 12.6% and 9.2% of the territory respectively, and Morelos, Tlaxcala and Mexico City are the smallest, with a territory of 0.2%, 0.2% and 0.1% respectively.

Demographic context

Mexico is also large in terms of its population. It has almost 130 million inhabitants (tenth largest population in the world) and its population has grown over fivefold since 1950, when the population was around 25 million. However, its annual population growth rate has been slowing from over 3% in the 1960s to 1980s, to 1.24% in 2017. This rate is expected to continue decreasing in the future with a population forecast of 164 million in 2050 (United Nations, 2017^[1]).

It is also demographically diverse with “a mosaic of nations, tribes and languages” (Octavio Paz, 1978). *Mestizos* (people of mixed descent, principally of Indigenous and European ancestry) are the largest population subgroup (around 65%), while Mexicans of predominantly European descent constitute 15% of the population. In addition, there are 68 recognised Indigenous groups located predominantly in the mountainous areas of a few states (e.g. Guerrero, Chiapas, Yucatan and Oaxaca). The Indigenous groups account for around 12 million people who speak over 80 languages and several dialects (CDI, 2017^[2]).

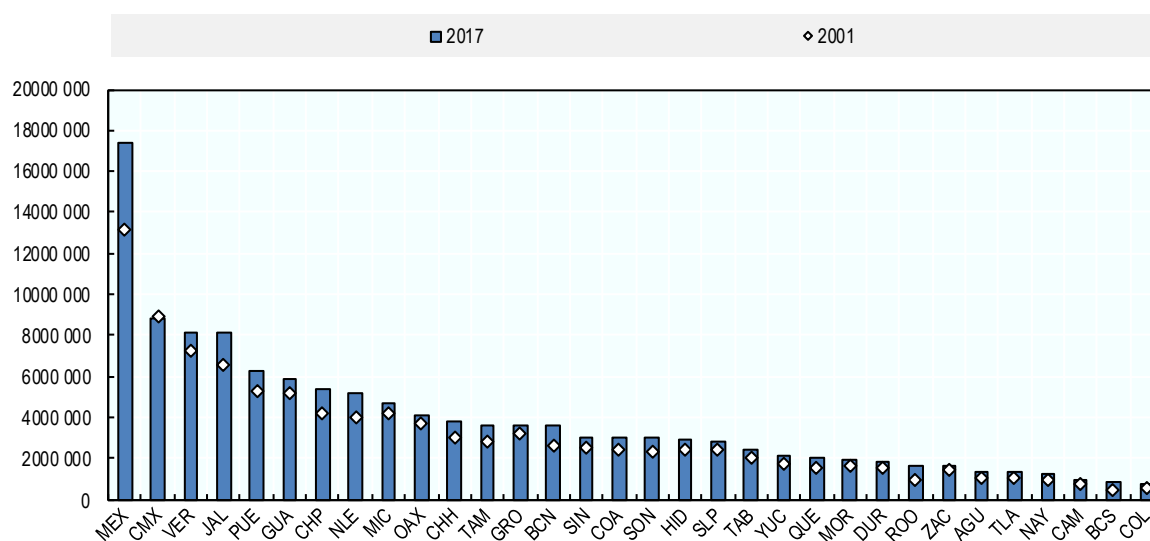
Mexico has a predominantly young population, but is currently experiencing a significant demographic transition. Around 27% of the Mexican population is younger than 15-years-old, and only 7% is over the age of 65. The median age is 27.5 years, but this is

expected to increase up to 41 years by 2050 due to a sharp decline in birth rates (1.7 children per female) and increasing life expectancy (75.1 years) (INEGI, 2017^[3]).

The average population density in Mexico is 61 people per square kilometre (INEGI, 2017^[3]), but this substantially varies between states and between urban and rural areas. Eight of the 32 states host over 50% of the national population (Figure 2.1). While Mexico City hosts almost 6 000 people per square kilometre, six other states have a population density below 20 people per square kilometre. Around 80% of the Mexican population lives in densely populated urban areas, and over 11% reside in slums (United Nations Millennium Development Goals Indicators, 2017^[4]).

By far the largest urban area is Mexico City, with around 8.9 million people living within the city and 23.2 million people in the district. Other metropolitan areas, such as Puebla, Monterrey and Guadalajara, are growing rapidly, with 2.5, 1.2, and 1.5 million people living in these cities respectively. Metropolitan areas in Mexico are the destination of a large share of the population moving from rural areas, which are often remote (in mountainous areas), highly fragmented (around 100 000 rural localities have fewer than 100 inhabitants), and host the majority of Indigenous and impoverished¹ people (CONEVAL, 2017^[5]).

Figure 2.1. Population of Mexico by state, 2001 and 2017



Source: OECD (2017) Regional Demography Database.

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Mexico is a country of emigrants. In 2016, 10% of Mexicans resided abroad, 97% of them in the United States (SRE, 2017^[6]). However, less than 1% of the current population

¹ The definition of poverty used by the National Council for the Evaluation of Social Development Policy (CONEVAL) is a multi-factor measure including disposable income per day, nutrition, access to healthcare, education and others.

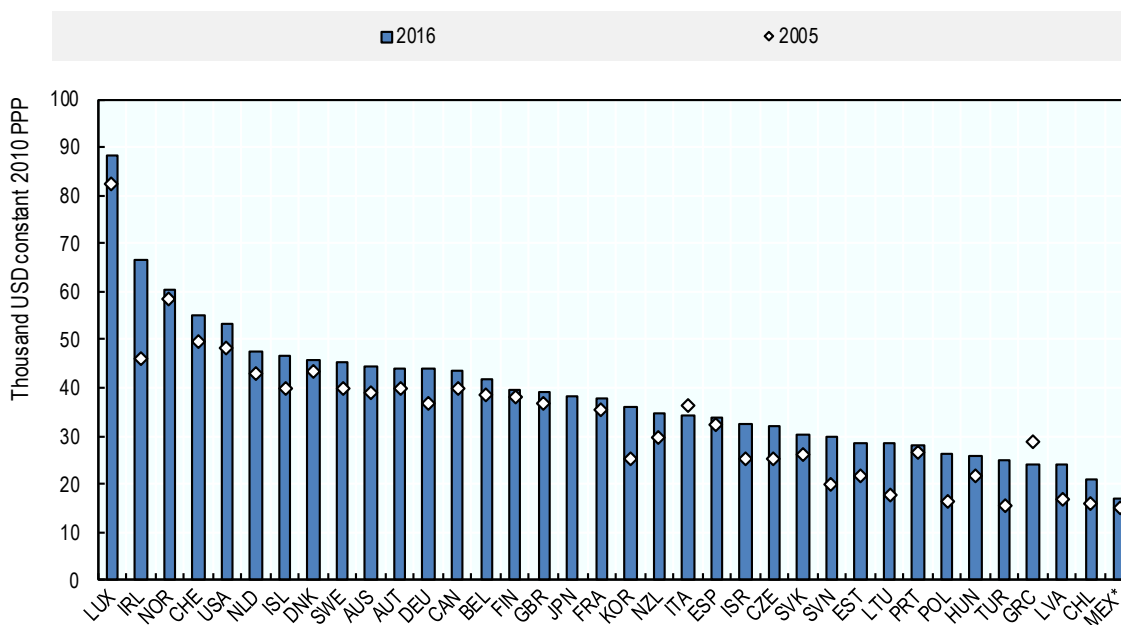
in Mexico was born abroad (INEGI, 2017^[3]). The number of Mexicans returning from the United States has exceeded the number emigrating to the United States since 2009, however, despite this trend the migratory balance is expected to remain negative in the next decade (OECD, 2017^[7]).

Economic context

National economy

Mexico is an important player in the world economy. Its gross domestic product (GDP) is the seventh largest among OECD countries (OECD, 2018^[8]), and the world's 11th largest economy in terms of purchasing power parity (PPP) (OECD, 2017^[9]). Currently growing at a rate of 2.2%, Mexican GDP is estimated to become the third largest among OECD countries by 2060, following the United States and Japan. However, Mexico has the lowest standards of living, and the country's GDP per capita is at the bottom when ranked with other OECD countries (Figure 2.2), despite its increase in the last decade (OECD, 2017^[10]).

Figure 2.2. Gross domestic product per capita, 2005 and 2016



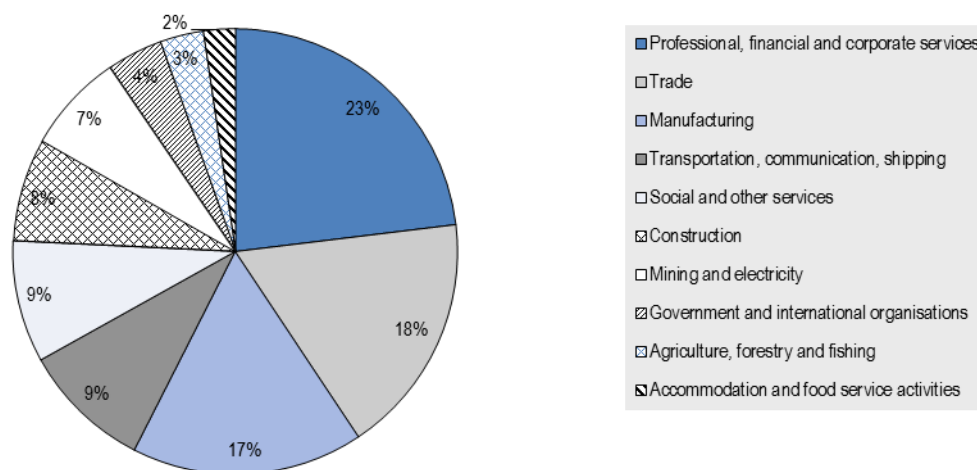
Source: OECD (2018), OECD Quarterly National Accounts Database.

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Mexico's economic growth has not translated into social inclusion. Mexico has the largest income disparities among OECD countries (Gini coefficient of 0.46), and there has not been any improvement over the last 10 years (OECD, 2018^[11]). In 2016, while the top 1% of earners received 14% of the total income, the bottom 20% received less than 5%. High inequalities have translated into persistent high poverty rates, and although extreme poverty has declined over the last decade, a large share of the population (43.6%) lived in poverty, of which 7.6% (around 9.4 million people) in extreme poverty (CONEVAL,

2017^[5]). Almost 60% of the GDP contribution is made by professional, financial and corporate services (23%), trade (18%) and manufacturing (17%). (Figure 2.3). The lowest contributors to GDP are agriculture, and accommodation and food, (3% and 2% respectively).

Figure 2.3. Contribution of economic sectors to gross domestic product, 2017



Source: OECD calculations based on data provided by the Mexican Federal Secretariat of Labour and Social Welfare.

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Research, development and innovation

Compared to other OECD countries, Mexico's economy lags behind in terms of innovation. Inputs to innovation are below the OECD average. Government research and development (R&D) investment is 0.52% of GDP (compared to 2.36% OECD average), but has almost doubled in the last 15 years. Businesses only contribute 20% to total R&D expenditure, compared to an average of over 60% in OECD countries and there are only 0.7 R&D personnel per 1 000 employees (compared to 7.7 OECD average), 25% of whom work in business (compared to 61% OECD average) (OECD, 2017^[12]). Low public and private R&D investment, and the limited science and technology skills base, result in the lowest ratio of business R&D to GDP across OECD countries (0.16%).

Innovative practices within established businesses are not yet well developed. Only 1% of Mexican employees have developed or launched new goods or services, or set up a new business unit, establishment or subsidiary within an existing business (GEM, 2017^[13]). The latest National Surveys on Research and Technological Development (*Encuesta sobre Investigación y Desarrollo Tecnológico*, ESIDET) showed that 6.4% of companies undertook an innovation project, 2.5% introduced a new product into the market or implemented a new process and almost 70% of revenues of innovative companies came from unchanged products (INEGI-ESIDET, 2014^[14]).

The differences between large companies and small and medium enterprises (SMEs) are considerable, and SMEs lag behind in digitalisation and use of technologies. In particular, less than 10% of Mexican SMEs export their products and services (OECD and World

Bank, 2017_[15]), sell them via e-commerce or use cloud computing services. As SMEs receive only half the government support for R&D that large companies receive, this gap is likely to increase (OECD, 2017_[12])

Innovation outputs in Mexico are also low, for example, in 2016 there were fewer than 300 international patents filed by Mexico and around 15 000 scientific publications published, of which only 3.8% are top-cited. Both the number of patents and the percentage of top-citations are the lowest across the OECD (OECD, 2017_[12]).

The increase in the government's R&D budget, and the reintroduction of a scheme to support business R&D, are examples of steps recently taken to improve innovation (see Chapter 6). Nonetheless, progress has been slow, and some indicators have fallen in the last 10 years, such as the percentage of business R&D, the top-cited papers and the labour utilisation rate. More needs to be done to drive innovation more efficiently (OECD, 2017_[9]).

Mexico aims to further integrate into global value chains (GVCs). This will require a reduction of informality and an increase in productivity (Dougherty and Reynaud, 2017_[16]). So far, the country has benefitted largely from its geographical location and its position as a prime supplier of intermediate goods and assembler for the US manufacturing sector.

Using backward and forward participation to describe GVC participation of a country, Mexico's backward participation, i.e. the share of foreign value added in Mexico's gross exports, is greater than the country's forward participation, measured as the share of domestic value in gross exports (Dougherty and Reynaud, 2017_[16]). Backward integration is concentrated in medium-high to high technology industries and forward participation in mining. Overall, Mexico's specialisation in technologically advanced industries is still low (bottom 25% of OECD countries) (OECD, 2017_[17]).

Participation of Mexican SMEs in GVCs is very limited and often confined to the domestic supply chains of large companies. For example, in manufacturing, the most export oriented sector, 88% of the exporters are large firms (Dougherty and Reynaud, 2017_[16]). There are substantive gaps in the management skills and work routines of firms with less than 50 employees and of large companies with over 250 employees in areas that are considered to be related to export activity, namely in terms of managers' experience, Internet presence (website), on-the-job training of workers, financial audits and international quality certifications (OECD, 2017_[9]).

Strategic industries

The Mexican National Productivity Committee (*Comité Nacional de la Productividad*, CNP) has identified eight strategic industries for targeted policy interventions to enhance productivity. Three of the sectors – retail, tourism and food – are traditional industries in the Mexican economy and employ a large share of workers. However, they have low productivity, partly due to the large share of informality, the dominance of micro-enterprises and the lack of R&D. The government strategy for these industries is to increase productivity and competitiveness through R&D, technological innovation and complex business services.

The other five strategic industries – automotive, agro-industrial, aerospace supply, electric-electronics and energy – have high-productivity and growth potential. While these industries employ a much lower share of the population, their R&D intensity, productivity, and potential contribution to gross domestic product (GDP) are higher. The

previous administration supported the development and consolidation of these industries, through specific sectoral plans with associated budgets and targeted funding programmes of the National Council of Science and Technology (*Consejo Nacional de Ciencia y Tecnología*, CONACyT), with the expectation of increased R&D funding and practices and greater upward integration in international value chains.

The Industry Programme for the Automotive Sector (PEIA) 2012-2020 seeks to position Mexico among the leading three countries in the design and production of automobiles and automotive parts. The automotive industry in Mexico includes around 20 of the largest international car companies and over 600 suppliers that set up operations in central and northern Mexican states, employing almost 900 000 workers. The main competitive advantages of operating in Mexico are low production costs (12% lower than the United States), highly qualified workers, multiple international trade agreements and easy access to the main international markets (SE, 2012_[18]).

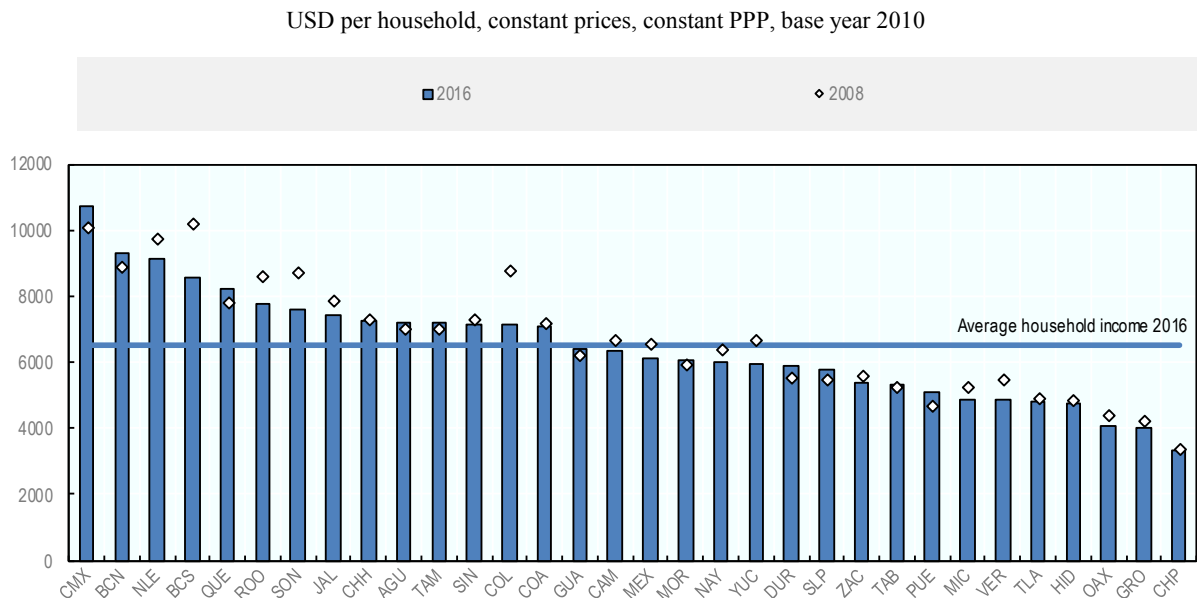
Mexico's aerospace industry has also attracted foreign investment through competitive salaries, low production and transportation costs (16% lower than the United States) and a relatively well-qualified workforce. This industry has grown at an average annual rate of 15% from 2006 to 2016. It is located in 17 states (mostly northern and some central states) and is expected to create a large share of high-quality jobs. The Pro-Aéreo 2012-2020 government plan for the aerospace industry aims to position the country among the top 10 suppliers of aerospace products worldwide (FEMIA; SE, 2012_[19]).

The electrical and electronics industry has also experienced unprecedented growth since 2010. The 10 largest manufacturers worldwide operate in Mexico, employ over 500 000 people and benefit from manufacturing costs 15% lower than the United States. The focus is on the production of televisions, mobile phones, electro-medical equipment and computers. This industry is three times more intensive in R&D than the average industry in Mexico, and is expected to increase R&D expenditure significantly in the near future. The government's industry plan is to make Mexico a top exporter of electronic goods worldwide.

Due to large national onshore and offshore reserves, oil is the country's key energy resource. Since 2005, production has sharply declined, coinciding with the fall in oil price, which resulted in a reduction of government oil revenues from 45% in 2008 to 10% in 2016. To raise productivity, private energy investment and state revenues, the previous government granted private foreign companies the right to explore and develop oil and gas resources, exclusively operated by the state-owned oil company *Petróleos Mexicanos* (PEMEX) until 2015 (Mexican Federal Government, 2015_[20]).

Regional economies

The 32 Mexican states represent a highly diversified economic structure. In 2016, the income per capita in Mexico City (USD 5 973) was 3.6 times higher than in Chiapas (USD 1 652) (OECD, 2016_[21]). Although inequalities are high across all states, with a Gini Index varying between 0.4 and 0.5, they are particularly high in Mexico City (Gini Index 0.91). Living in one of the worst-faring states can mean being four times as likely to be at risk of poverty than people living in the best-faring states (OECD, 2017_[22]). Regional disparities have increased between a highly productive modern economy in the north and in the centre, and a lower-productivity traditional economy in the south (OECD, 2017_[9]).

Figure 2.4. Disposable household income across Mexican states, 2008 and 2016

Source: OECD (2015), OECD Regional Statistics (database).

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The contribution of the 32 Mexican states to the overall economy varies largely. Reasons for this include factors that are not or not directly affected by public policy, such as geography and proximity to markets, and others where public policy can have a direct impact, such as education attainment, infrastructure or ease in doing businesses.

In 2016, only six states contributed collectively to around 50% of the national GDP: Mexico City (16.9%), Mexico State (8.9%), Nuevo León (7.3%), Jalisco (7.1%), Veracruz (4.7%), and Guanajuato (4.2%). These states are also the largest contributors to the GDP of the services sector. The states with the highest contribution to the GDP of agriculture are in the fertile lands of the Pacific Coast (Jalisco 11.3%, Michoacán 9.4% and Sinaloa 7.7%). The highest contribution to the GDP of the industrial sector is Nuevo León (8.5%) due to the wide range of industries located near the border with the United States, and the state of Mexico (8.1%), where most of the textile, pharmaceutical, automotive and metalworking industries are located (OECD, 2017_[23]).

With the opening of the economy to global markets, northern states have benefitted from their geographic proximity to the United States. Mexico does not have a comprehensive regional policy. An important initiative to balance the growth of different regions, the Mexican government passed in 2016 a law establishing “Special Economic Zones”. The objective was to promote sustainable economic growth and reduce poverty through the provision of basic services and expansion opportunities for the states and municipalities that lag behind the most in terms of social development (Mexican Federal Congress, 2016_[24]).

The Special Economic Zones seek to close regional gaps by creating new industrial development areas that attract investment, generate quality jobs, participate in value chains, increase productivity and competitiveness, create demand for local services, and facilitate better distribution of income among the population. These zones are considered

priority areas of national development. The first zones have recently been established in municipalities of the states of Michoacán, Guerrero, Oaxaca and Chiapas. (OECD, 2017^[9]).

Likely scenarios for the future economy

Since 2012, a wide range of reforms has been implemented with the aim of addressing informality, improving growth, well-being and income distribution. The implementation of these reforms has seen success in tax policy, financial sector liberalisation, deregulation of telecommunications, competition policy and regulatory reform, energy market openness, and the reform of the election system. However, there has been less success in reforms of the labour market and tackling informality, education quality, anti-corruption and transparency, judicial processes and fiscal federalism. There has been less progress in reforms in the areas of unemployment insurance, pensions and social benefits, health system, urban planning and agricultural transformation (OECD, 2017^[9]).

Full implementation of the structural reforms planned in 2012 was expected to add 1% to GDP growth after five years (OECD, 2017^[9]). However, with varying degrees of progress, mixed results of reforms of key sectors (e.g. financial, telecommunications, energy, education and health) until now and a new incoming administration, uncertainty remains around the continuation of the ongoing reforms. Widespread corruption, crime and an unreliable judicial processes, together with tax evasion and avoidance, appear to be the main barriers to the successful implementation of reforms (OECD, 2017^[9]).

During 2017 and 2018, the long negotiations of the NAFTA agreement added more uncertainty to the economy, however, the recently signed USMCA trade agreement has boosted confidence in the future of the Mexican economy. In addition, in 2018 Mexico signed the Asia-Pacific trade agreement with 10 other countries, and renegotiated the conditions of its trade agreement with the European Union. Therefore, international trade is expected to remain important for the Mexican economy.

Despite positive international trade projections, Mexico's GDP in 2018 and 2019 is expected to grow by 2.2% and 2.5% respectively, well below the expected OECD average of 3.7% for both years (OECD, 2018^[25]). The economy is expected to remain resilient owing to a sound macroeconomic policy framework. However, due to low social spending, inequalities are expected to remain high (OECD, 2017^[9]). Certain states, industries and categories of workers will continue benefitting more from open borders and the current economic structure than others, increasing current income gaps.

The automobile, aerospace and electronics industries are expected to grow until 2020, both in Mexico and worldwide. The mining and energy sectors are also expected to increase in the long term (Indra Business Consulting, 2017^[26]). The future of the oil industry is uncertain. Recently discovered oil reserves exceed expectations and could lower energy prices but boost exports. This would benefit Mexican industry as a whole with stronger economic activity and increase public finances through higher revenues from licensing and profit sharing.

The re-allocation of resources from low-productivity to high-productivity industries would boost Mexico's economic prospects (Levy, 2018^[27]), also as low levels of productivity are still a main barrier to drawing more value from global engagement. To move up in global value chains, product and market diversification also need to increase. Mexico needs to further improve its capabilities in knowledge and skills-intensive activities, such as new product development, manufacturing of core components and

brand development (OECD, 2017_[28]); higher education plays a fundamental role in this through the development of skills and the production and translation of knowledge for innovation.

National and regional labour markets

The Mexican labour market is characterised by low and stable labour force participation (63.6%), along with low employment and unemployment rates (taking into consideration 58% employment in the informal sector), compared to the OECD average. The labour market outcomes of youth, women and other disadvantaged groups are poorer than in most OECD countries (Table 2.1). The 2012 Labour Act resulted in some improvements in the labour market, but the indicators of the Mexican labour market remain below most OECD countries and many other Latin American countries (Inter-American Development Bank, 2018_[29]).

Table 2.1. Key labour market outcome indicators in Mexico and OECD countries, 2017

Indicator	Mexico	OECD	Trend (2006-2017) in Mexico
Labour force participation rate (15-64 year-olds)	63.4%	72.1%	Increase
Employment rate (15-64 year-olds)	61.1%	67.8%	Stable
Unemployment rate (15-64 year-olds)	3.6%	5.9%	Slight decrease
Youth unemployment (15-24-year-olds)	6.7%	10.9%	Slight decrease
Youth not in education, employment or training (20-24-year-olds) (2016)	24.9%	16.2%	Slight decrease
Labour force participation rate of women (15-64 year-olds)	46.7%	64%	Increase
Gender wage gap (2016)	16.5%	13.9%	Stable
Employment of disadvantaged groups (below prime-age men)	40%	25%	Slight decrease

Source: OECD (2017) Employment and Labour Force Statistics Database.

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Employment and labour force participation

The labour force participation rate in Mexico (63.4%) is the second lowest across the OECD (72.1% average), and the employment rate (61.1%) is also below the OECD average. However, the unemployment rate (3.6%) has been relatively low for nearly two decades, and is below the OECD average of 5.9%. The absence of a national system of unemployment insurance in Mexico means that most unemployed people cannot afford a lengthy search for a job suited to their level of education and skills, and often take the first option available (OECD, 2017_[9]).

Mexico has a large informal sector by OECD standards. Around 58% of the Mexican workforce (15-64 year-olds) works without social security or pension coverage; a share that has slightly decreased in the last 10 years (INEGI-ENOE, 2017_[30]). Informal employment is a major issue as it increases inequality and social exclusion while reducing productivity and economic growth (OECD/CAF/UN/ECLAC, 2017_[31]). A worker in the informal sector tends to be less productive, has less job security, has no access to social benefits and does not receive training opportunities on the job. The informal labour market also affects low-skilled workers and industries such as retail and tourism. In addition, informality results in lower fiscal revenues and more vulnerable social institutions. Young people in Mexico are particularly affected by informal employment, and around 60% of those working in informal jobs have been working in an informal job

for at least a year. Chapter 4 discusses the implications of informal employment for young workers who hold a higher education qualification.

The 2012 Labour Act reforms aimed to tackle informal employment by introducing short-term training contracts and six-month probation periods, and facilitating the hiring of seasonal, temporary and part-time workers. However, the strictness of employment protection legislation regarding regular and temporary contracts remains above OECD standards (OECD, 2017_[32]). The 2014 tax reforms reduced personnel costs, social security costs and tax obligations for companies in their first ten years of operation. The federal government introduced the “Go Formal” initiative in 2014 to raise awareness of the benefits of formality and strengthen monitoring through formal government inspections of companies. Informality has decreased from 60% to 58% since the reforms, but much more needs to be done (OECD, 2017_[32]).

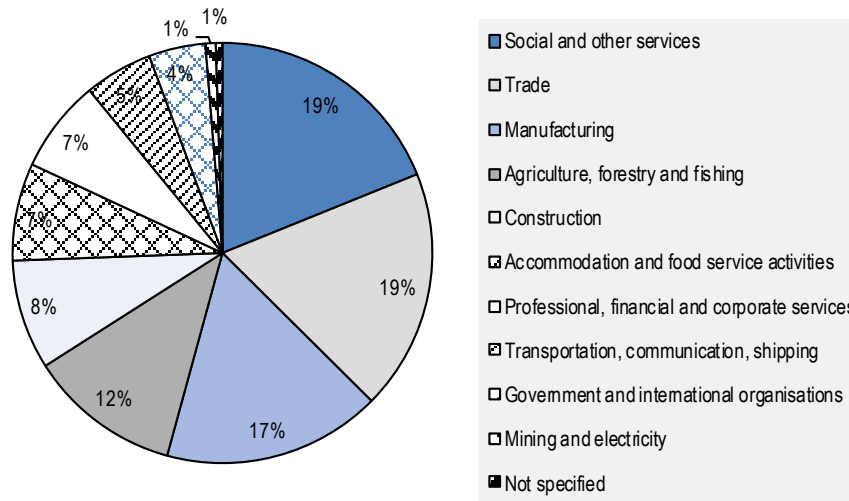
Almost half of Mexican workers (48%) are employees, 41% are self-employed, 5% are employers and 6% undertake unpaid work (INEGI-ENOE, 2017_[30]). Over two-thirds of employees (68%) are working in SMEs, particularly in the services sector, compared to the OECD average of 60%. Almost two thirds (61.2%) of Mexican workers are employed in services, 25.9% in manufacturing and 12.9% in agriculture (OECD, 2018_[33]).

The three sectors that employ the largest number of workers in Mexico are trade (19%), social and other services (19%) and manufacturing (17%) (Figure 2.5). These sectors employ over half of workers, and together with agriculture, forestry and fishing (12%) and construction (8%), account for almost three quarters of formal employment. Manufacturing and trade are large contributors to GDP (17% and 18% respectively), whereas other high-employment sectors, such as agriculture or social and other services, have low GDP contributions. Sectors with relatively low shares of employment, such as mining and professional, financial and corporate services, have high GDP contributions (7% and 23% respectively).

Employment levels and the informality of the labour market differ significantly between states. In 2017, the unemployment rate ranged between 7.3% in Tabasco to 1.4% in Guerrero and other southern states. Labour informality varies greatly, from very high levels in the central and southern states of Oaxaca (82%), Chiapas (78%), and Guerrero (78%), to considerably lower rates in the northern states of Nuevo León (34%), Chihuahua (37%), and Coahuila (37%) (INEGI-ENOE, 2017_[30]).

Employment trends from 2011 to 2016 also present large disparities by state, from a decrease of 5.5% in Chiapas to an increase of 8.3% in Chihuahua. Overall, the employment rate decreased in 9 southern and central states, while it increased in the remaining 21 states. Only 5 states (Mexico, Jalisco, Chihuahua, Guanajuato and Puebla) accounted for over 40% of net job creation during this period (OECD, 2018_[34]).

Figure 2.5. Employment in Mexico by sector, 2017



Source: Mexican Labour Force Survey, 1st semester 2017, (INEGI-ENOE, 2017_[30]).

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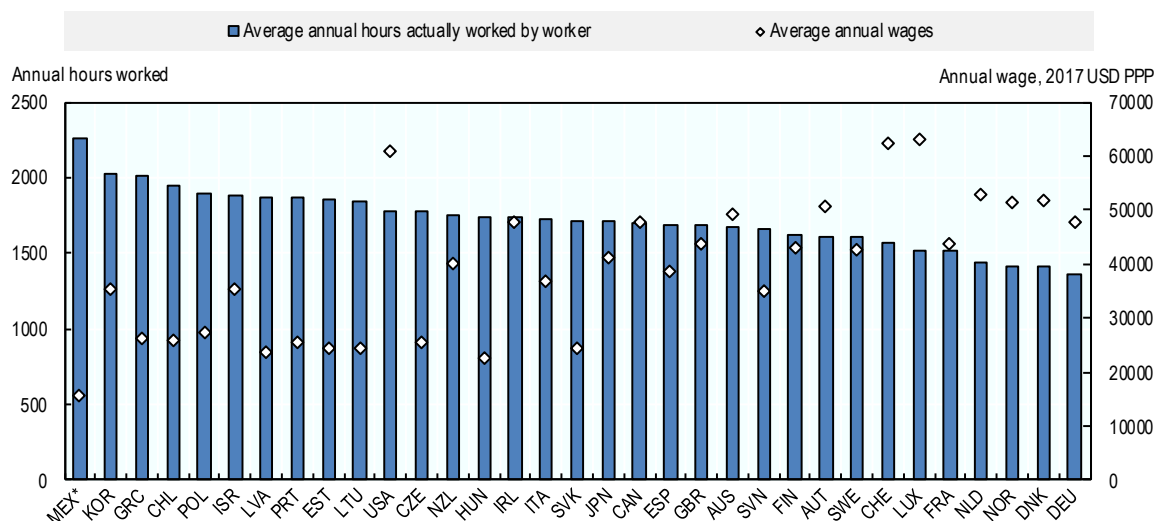
Earnings

Regardless of employment arrangements, Mexican workers tend to work long hours (2 137 hours, compared to the OECD average of 1 752 hours annually), but receive low pay. Mexico has the lowest annual average wage (USD 15 056 in PPP) among OECD countries. It is nearly four times lower than the US average wage (see Figure 2.6), and has remained nearly constant over the last 20 years.

The gross minimum wage in Mexico is also very low, representing only 37.5% of the median wage, which is well below the OECD average of 50% (OECD, 2017_[32]). Furthermore, the wage levels are unequally distributed: while 18% of employees receive more than two times the median wage, 19% receive below half of the median wage (OECD, 2018_[35]).

In addition, workers in the worse-faring states are seven times more likely to work longer hours for lower pay than people living in the best-faring states (OECD, 2017_[22]). The average wage differs widely by state. While workers in the northern states and in Mexico City receive a monthly wage of between MXN 7 500 and 8 500 (Mexican pesos), the wage levels remain below MXN 4 500 in the southern states of Chiapas and Oaxaca. There are also large wage discrepancies in rural versus urban areas, where the average wage is three to four times lower for workers in rural areas (INEGI-ENOE, 2017_[30]).

Figure 2.6. Annual hours worked and annual wage, 2017



Source: OECD (2017), OECD Statistics, http://stats.oecd.org/Index.aspx?DataSetCode=AV_AN_WAGE and <http://stats.oecd.org/Index.aspx?DataSetCode=ANHRS>.

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Employment and labour market participation of different demographic groups

Employment and labour market participation vary considerably between men and women, as well as between different age groups. Although the labour force participation of 20-64 year-old Mexican women has increased over the last seven years from 41% to 46.7%, it remains below the OECD average (64%) and below the participation rate of Mexican men (81.8%). The employment rate of women in this age group (50.6%) is also well below that of men (89%) (OECD, 2017^[9]), and women earn 16% less than men on average. The gender wage gap is much larger for the self-employed (44%) and for those with higher education qualifications (33%) (OECD, 2018^[33]).

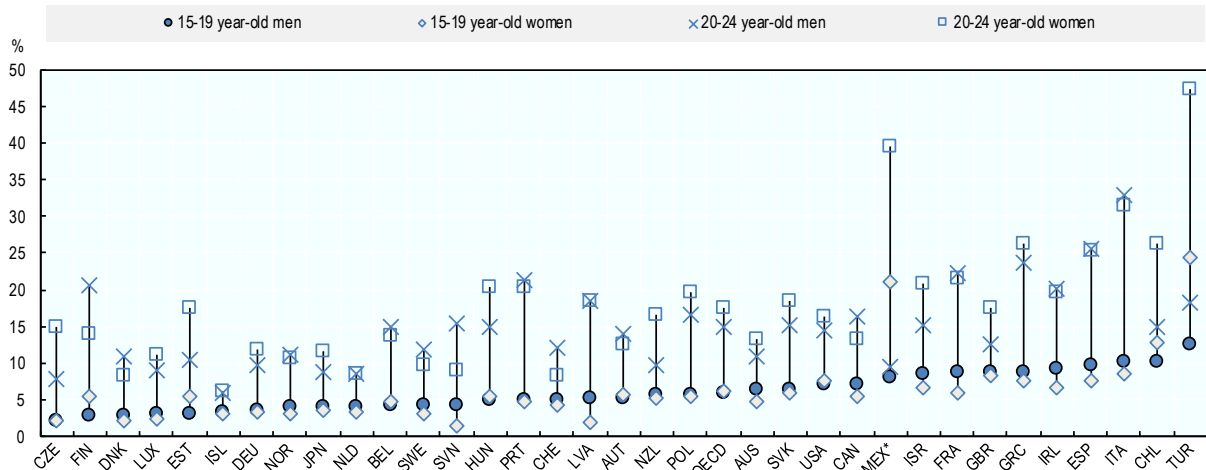
Mexican youth and older workers are the most disadvantaged age groups in the labour market. Only 43.8% of 15-24 year-olds and 56% of 55-64 year-olds participate in the labour force, compared to 74% of prime-age workers. The employment rate for young (41.9%) and older (55.1%) workers is also below prime-age workers (71.9%). The decreasing employment rate for young workers (48.9% in 2000) and the increasing rate for the older workers (51.7% in 2000) reflect the increasing educational attainment of the younger cohort and gradual labour force aging (OECD, 2018^[33]).

Mothers with children, youth who are not in full-time education, employment or training (NEET), workers aged 55-64, immigrants, and persons with disabilities are particularly disadvantaged in the Mexican labour market. The employment rate for these groups is more than 40% lower than the employment rate for prime-age men in Mexico, compared to the OECD average of 29% (OECD, 2017^[12]).

Mexican youth have one of the highest rates of NEET among OECD countries. In 2017, 13.9% of 15-19 years-olds and 23.8% of 20-24 years-olds were not in employment, education or training. For both age groups, non-participation rates have decreased from 18.3% in 2010 for the younger cohort, and from 27.1% for the older age group. Non-

participation in education, employment or training is particularly high among young women in Mexico, the second highest after Turkey across OECD countries (Figure 2.7).

Figure 2.7. Youth not in education, employment or training (NEET) by gender and age, 2016



Note: 2015 values for CHL, IRL, LUX for 15-19; 2014 values for JPN.

Source: OECD (2018), OECD education database: transition from school to work, <http://stats.oecd.org/index.aspx?queryid=79318>, accessed on January 2018, and <https://data.oecd.org/youthinac/youth-not-in-employment-education-or-training-neet.htm>.

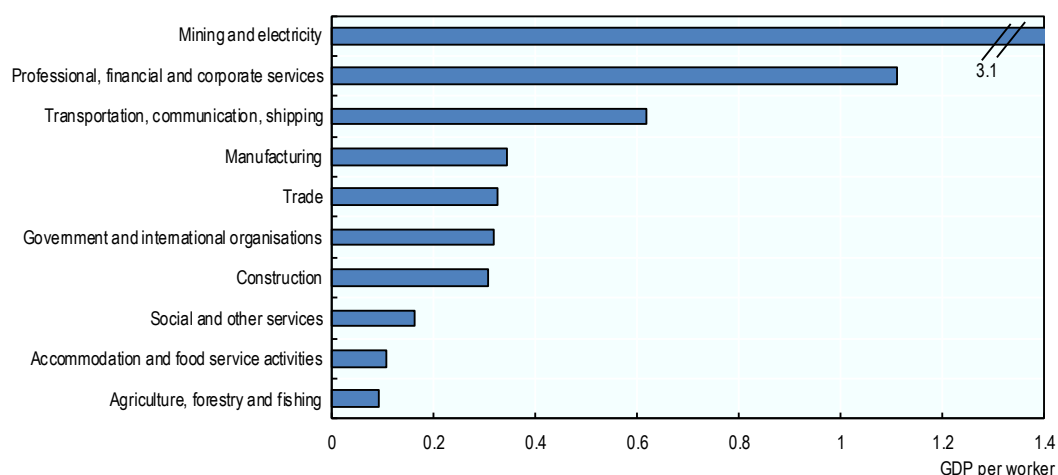
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Labour market productivity

Mexico has the lowest GDP per hour worked (USD 18.5) among OECD countries (average USD 46.7), despite steady growth since 2010. Labour productivity differs across sectors (Figure 2.8). Some of the industries that employ more people in Mexico, such as agriculture (12%) and social and other services (19%), have some of the lowest productivity per worker (0.09 and 0.16 respectively). By contrast, some of the smallest industries in terms of number of workers, such as transportation, communication and shipping (5%), and mining and electricity (1%), have the highest levels of productivity (0.61 and 3.1 respectively). Employees in information industries are twice as productive as the total non-agricultural business sector. The difference between the productivity of these two sectors is the third largest across OECD countries (OECD, 2017_[36]).

Mexico has the largest productivity gap in the OECD by firm size. While the productivity of large firms is in line with the OECD average (USD 70 000), the productivity of small companies (USD 7 000) is ten times lower than that of large companies. The low levels of productivity in the majority of small companies pose a risk to the economy (OECD, 2017_[37]).

There are large differences in productivity between states (López Córdova J.E and J. Rebolledo, 2016_[38]). Southern states have the lowest productivity and the northern states are three times (Mexico City four times) more productive than southern states. The exception is the state of Campeche, where productivity is over 10 times higher than in the other southern states due to its large oil sector (OECD, 2016_[39]).

Figure 2.8. Average productivity per worker by sector, 2017

Source: OECD calculations based on data provided by the Mexican Secretariat of Labour and Social Welfare.

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Mexico performs poorly in the OECD Job Quality Framework, which assesses labour market performance in terms of more and better jobs. Compared to other OECD countries and emerging economies, formal jobs in Mexico are characterised by a poor quality of work environment, low average earnings and high inequalities (OECD, 2017_[32]).

Mexico has one of the highest self-employment rates in the OECD. Almost one-third (31.4%) of the workforce either employs others, works for themselves, are members of producers' co-operatives, or are unpaid workers in family businesses (OECD, 2018_[40]). The entrepreneurial ambitions of Mexicans are relatively high; around half of the workforce (50.1%) believes that they possess the skills and knowledge to start a business, and 36.4% are able to identify business opportunities in the area where they live. However, 28.4% indicate that the fear of failure prevents them from setting up a business (GEM, 2017_[13]). Business creation is more common among males than females, and among 35-44 year-olds compared to other age groups. One-quarter of entrepreneurs start a business out of necessity, particularly females, and they have low expectations regarding job creation (GEM, 2017_[13]).

Across the OECD, Mexico has the third largest barriers to entrepreneurship after Turkey and Israel, but these are lower than non-OECD countries such as Brazil, China or India and have decreased since 2003. These barriers include the administrative burden for creating new firms, the regulatory protection of incumbents (legal barriers, antitrust exemptions, barriers in network sectors), and the complexity of regulatory procedures (licences, permits, simplicity of procedures) (OECD, 2015_[41]). Other research also suggests that some of the framework conditions for entrepreneurship in Mexico are insufficient: entrepreneurial education at all levels, government policies (taxes and bureaucracy in government policies), internal market burdens or entry regulations, entrepreneurial finance, and R&D transfer (GEM, 2017_[13]).

Mexico has made some progress in supporting growth-oriented entrepreneurship. As part of efforts to foster high-growth SMEs, business incubators and accelerators were established with 40 public-private venture capital funds (OECD, 2017_[22]). Although

Mexico City has a growing entrepreneurial ecosystem, there is still a need for high-impact entrepreneurs who will bring disruptive changes to their industries (Endeavor Mexico, 2017^[42]).

Future labour markets

The actual demand for jobs and skills and future projections is difficult to measure, and there can be considerable variation between countries, including among jobs for highly educated people (Nedelkoska and Quintini, 2018^[43]). There are very few projections on the future of the Mexican labour market, but the recently signed trade agreement, USMCA is expected to open new opportunities for employment in sectors with a focus on international trade. However, to better integrate into global value chains, Mexico needs to decrease informality and increase productivity. This can be done by increasing the share of workers employed in strategic industries with potential growth opportunities (automotive, agro-industrial, aerospace and electric-electronics), and increase R&D investment in these sectors to increase specialisation in activities with more value-added. The strategies designed for these sectors are likely to increase employment and investment in the medium term.

The energy sector is the only industry that has a comprehensive strategic plan for human resources development (*Programa Estratégico de Formación de Recursos Humanos en Materia Energética*, PEFRHME). The plan puts emphasis on a more active role of higher education in work-based learning (e.g. internships, on-the-job training), certifications, and increased collaboration in education with the United States (O'Connor and Viscidi, 2015^[44]).

The Secretariat of Economy estimated in 2017 that the automotive industry could create 5.9% more jobs by 2020, particularly in the northern and north-eastern states. Furthermore, the large traction of the automotive industry is expected to propel an increase of 2.5% more jobs in both the metalworking and the tools industries. The aerospace supply industry is expected to create 4.6% more jobs in the northern states, mostly for the highly qualified (Indra Business Consulting, 2017^[26]). The oil sector is also estimated to create new jobs, with approximately 135 000 higher education graduates needed in the short term (SENER, 2015^[45]).

New technologies, such as robotics and artificial intelligence, are changing people's jobs and, as in many countries, could have a large impact on the Mexican labour market. Around 14% of jobs in OECD countries are highly automatable, and another 32% could face substantial change in how they are carried out (Nedelkoska and Quintini, 2018^[43]). Automation mostly affects the manufacturing industry and agriculture, and some service sector jobs (OECD, 2018^[46]). Nonetheless, automation will not mean that all jobs that are technically automatable will disappear. This will depend on various factors, such as technology penetration and adoption, the cost of human labour relative to the new technologies, and social preferences for automating certain tasks (OECD, 2018^[46]). Automation could also create new jobs as well as change the nature of some existing jobs, and therefore increase levels of employment. However, the highest risk is in routine jobs with low skill requirements. Jobs requiring higher skills levels, ranging from professionals to social workers who require professional training and/or higher education, have the lowest risk. Automation could affect young people more than others, as entry-level positions have a higher risk of automation than jobs held by older workers (Nedelkoska and Quintini, 2018^[43]).

Implications for knowledge and skills needs

One of the greatest barriers to boosting and sustaining economic development in Mexico is the current structure of the economy, which is hindering the effective utilisation of the skills available (OECD, 2017_[32]). The Mexican labour market is not attractive as it is based on long working hours, low salaries and poor employment conditions, particularly for young people and women, which neither attracts nor retains the best talent (OECD, 2017_[32]). The majority of the workforce is employed in traditional sectors (e.g. food, tourism and retail) and in SMEs, and more than half are employed informally with little to no opportunities for training. These workers, who generally present low productivity and innovation, might not be using their skills in their jobs. Informal employment can be an alternative for students who drop out of education, and thus be a deterrent to further skills development in the formal education system (OECD, 2017_[47]).

In order to increase the economic and social benefits from participating in global markets, Mexico aims to improve productivity and R&D in the economy, raise high-quality employment and technology specialisation in strategic industries (e.g. automobile, aerospace and electronics), and integrate upwards into global value chains (OECD, 2017_[17]). To date, Mexican operations in the global market have relied on the comparative advantage of lower costs, but the country will only move upwards in global value chains if this advantage is complemented with the availability of highly-skilled human capital. For eight of the ten main sectors in Mexico, talent availability is the main factor determining job location decisions (World Economic Forum, 2018_[48]).

New technologies are reshaping the content and tasks of many occupations and changing the demand for skills. Automation is also making routine skills redundant and cognitive skills increasingly important. This means that skills such as deductive reasoning (the ability to apply general rules to specific problems), fluency of ideas (the ability to come up with a number of ideas about a topic) or information ordering (the ability to arrange things or actions in a certain order or pattern according to a specific rule) will be increasingly needed in future (OECD, 2017_[49]). Mexican students will need to gain social and emotional skills, creativity, high-level cognitive capabilities and other skills which are relatively hard to automate (McKinsey Global Institute, 2017_[50]). Tasks for which it is difficult to establish routines cannot be easily automated, particularly tasks performed in complex situations, tasks related to creative intelligence, such as coming up with new ideas, and tasks related to social intelligence and empathy (Frey and Osborne, 2017_[51]).

Raising productivity in the traditional industries will require workforce training, including the development of transversal skills. Increasing specialisation and innovation in medium and high-tech manufacturing industries will require a greater involvement of researchers and specialised professionals, such as higher education graduates from different disciplines, who are more likely to be the source of disruptive innovations. In addition, to build a solid high-tech entrepreneurship ecosystem, Mexico needs to provide students with entrepreneurial skills so that they can create and grow their own start-ups and eventually employ others.

Notes

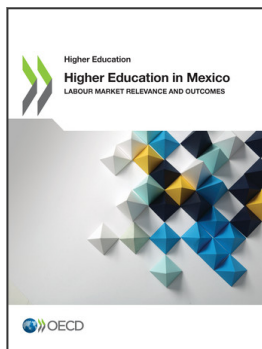
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