



Mohammed Bin Rashid School Of Government

POLICY BRIEF

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Summary

Before the Covid-19 crisis, Dubai's economy was internationally ranked as one of the most competitive economies in the world with a state-of-art infrastructure and one of the best in terms of ease-of-doing business. However, in 2016, Dubai's economy slowed down and entered a period of modest growth with an average growth rate of 2.6% between that period and 2019, compared to an average growth rate of 4.1% between 2011 and 2015. Growing below the potential rate indicates that Dubai's level of production is at lower levels given its ability. A deep-economic analysis suggests that Dubai's growth has been mainly driven by one factor of production, labor, and to a lesser extent by capital. The growth in labor productivity in 2015-2019 slowed down with the sluggish growth in the rate of capital formation. It is evident that employment expansion was the main driving force behind rising growth rates; a structural impediment to higher value-added economic activity in Dubai's workforce structure.

The Covid-19 pandemic has caused great disruption to normal economic and labor market activity. To sustained economic growth, innovations and new technologies are necessary yet they tend to threaten existing labor skills. Despite its labor-saving nature, history demonstrates that new technology is not the enemy of employment. Technology and automationsubstitutelaborbutalsocomplements labor service increasing productivity and output in ways that cause a higher demand for workers. Technological disruptions could create new occupations as well as erase other, that's a fact. If the right incentives are provided, the fourth industrial revolution could promise Dubai's economy significant gains in productivity and welfare. Policies that embrace AI and automation, and capital deepening should be adopted. In contrast, policies that slow down the deployment of automation and AI would be counterproductive.

The Future of Work and Dubai Economy: How Dubai wins the 4th Industrial Revolution?

Ahmed Rashad & Mona El-Sholkamy

Dubai Economy before Covid-19

Before the Covid-19 crisis, Dubai's economy was internationally ranked as one of the most competitive economies in the world with a state-of-art infrastructure and one of the best in terms of ease-of-doing business¹. However, in 2016, Dubai's economy². slowed down and entered a period of modest growth with an average growth rate of 2.6% between that period and 2019, compared to an average growth rate of 4.1% between 2011 and 2015 (see figure 1).. This economic downturn is evident in the negative output gap; which is basically when real GDP rates (adjusted for inflation) are compared to potential growth levels consistent with non-accelerating levels of inflation.

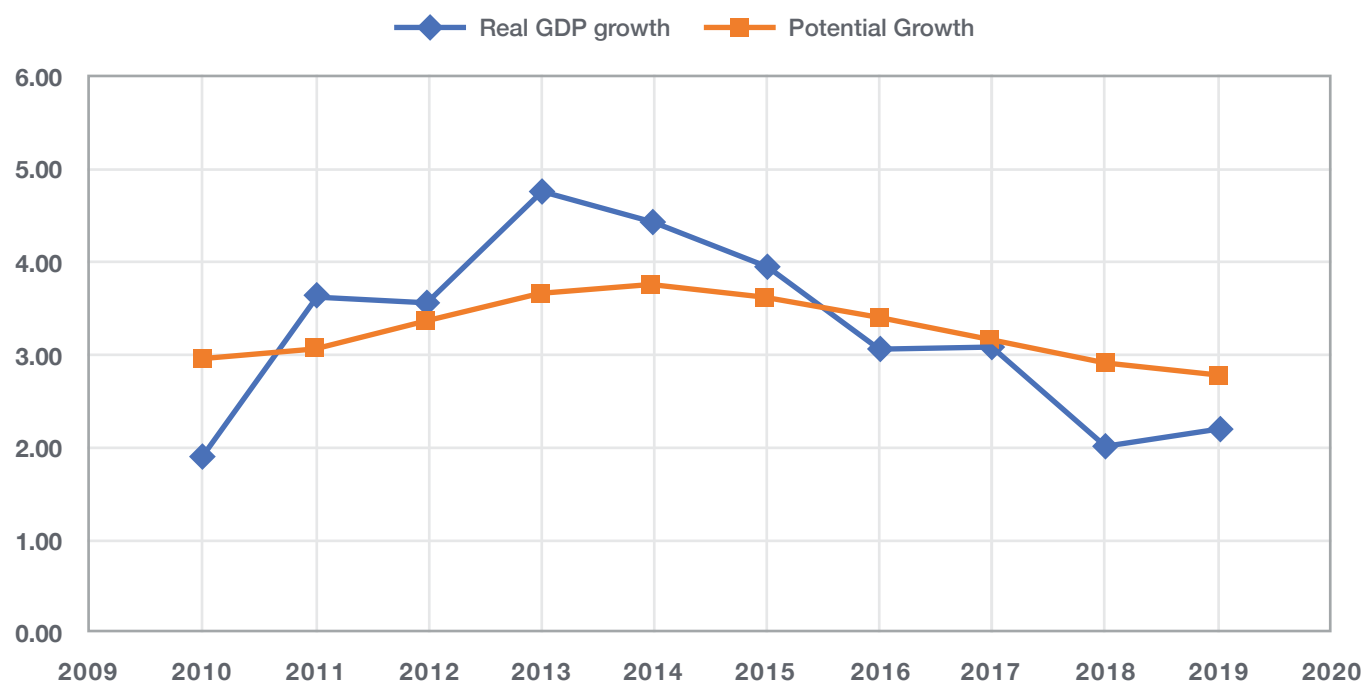
Growing below the potential rate indicates that Dubai's level of production is at lower levels given its ability. Hodrick-Prescott (HP) filter method has been used to estimate the potential level of output for Dubai's economy.

1 World Bank Group, "Doing Business 2020: Comparing Business Regulations in 190 Countries," The World Bank Group, accessed July 5, 2021, <https://documents1.worldbank.org/curated/en/688761571934946384/pdf/Doing-Business-2020-Comparing-Business-Regulation-in-190-Economies.pdf>.

2 The HP filter method decomposes the growth rates into trend and cyclical component, where trend is the potential GDP. Formally, the HP filter minimizes the following function $\sum_{t=0}^{\infty} (y_t - y_t^*) + \pi \sum_{t=2}^{\infty} [(y_{t+1}^* - y_t^*) - (y_t^* - y_{t-1}^*)]^2$.

Growing below the potential rate indicates that Dubai's level of production is at lower levels given its ability. Hodrick-Prescott (HP) filter method has been used to estimate the potential level of output for Dubai's economy.

FIGURE 1: DUBAI'S GDP AND POTENTIAL OUTPUT GROWTH



Source: Dubai Statistics Centre (DSC) and Authors calculations

A decomposition analysis of Dubai's economic growth rate into its supply-side drivers (growth in labor, capital, or total factor productivity) can shed light on the sources of Dubai's growth and its impediments³.

Table 1 presents the findings of the growth accounting analysis for the last decade. The number of workers has been constantly growing by more than

4% annually (see table 1 and figure 2). The analysis suggests that Dubai's growth has been mainly driven by one factor of production, namely labor, and to a lesser extent by capital.

The growth in workforce has been playing a greater role in the last five years at the expense of capital and total factor productivity (TFP). Our estimates suggest that 64% of GDP growth

TABLE 1: AVERAGE CONTRIBUTION TO GROWTH AND LABOR PRODUCTIVITY

	2011-2014	2015-2019
Average GDP growth (%)	4.1	2.9
TFP	-0.6	-0.7
Capital Growth (%)	5.3	3.1
Capital contribution to growth %	2.1	1.2
Employment Growth (%)	4.4	4
Employment contribution to growth %	2.64	2.4
Average capital growth per worker	0.9	-0.9
Capital formation as % of GDP	24	20

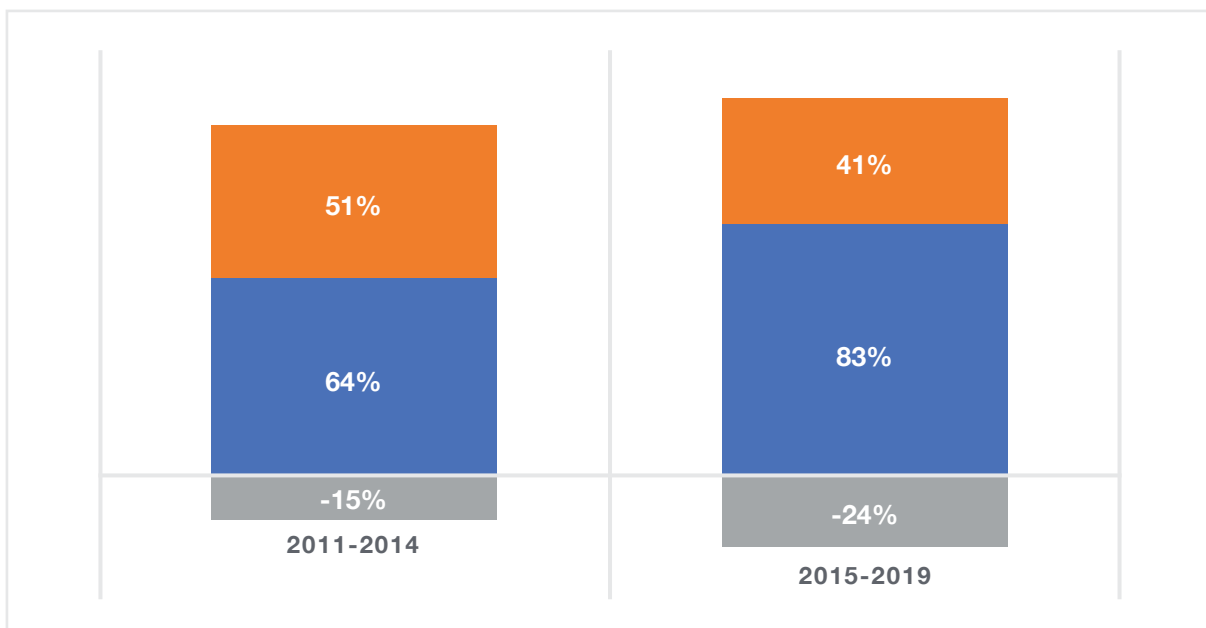
Source: Dubai Statistics Centre and authors' calculations

³ The decomposing analysis based in Cobb-Douglas production function where $GDP = AK\alpha L^{1-\alpha}$ where A is TFP & α is the elasticity of GDP to the change in K and it equals 0.4.

between 2011-2014 attributed to employment growth while 83% of GDP growth between 2015-2019 is due to growth in the size of the workforce (see figure 2), which reflects the increasing role of human capital. On the other hand, capital growth has slowed down from 5.3% in 2011-2014 to 3.1% in 2015-2019. Consequently, capital contribution to growth has shrunk and went down from 51% to 41%. The growth in labor productivity in 2015-2019 slowed down with the sluggish growth in the rate of capital formation.

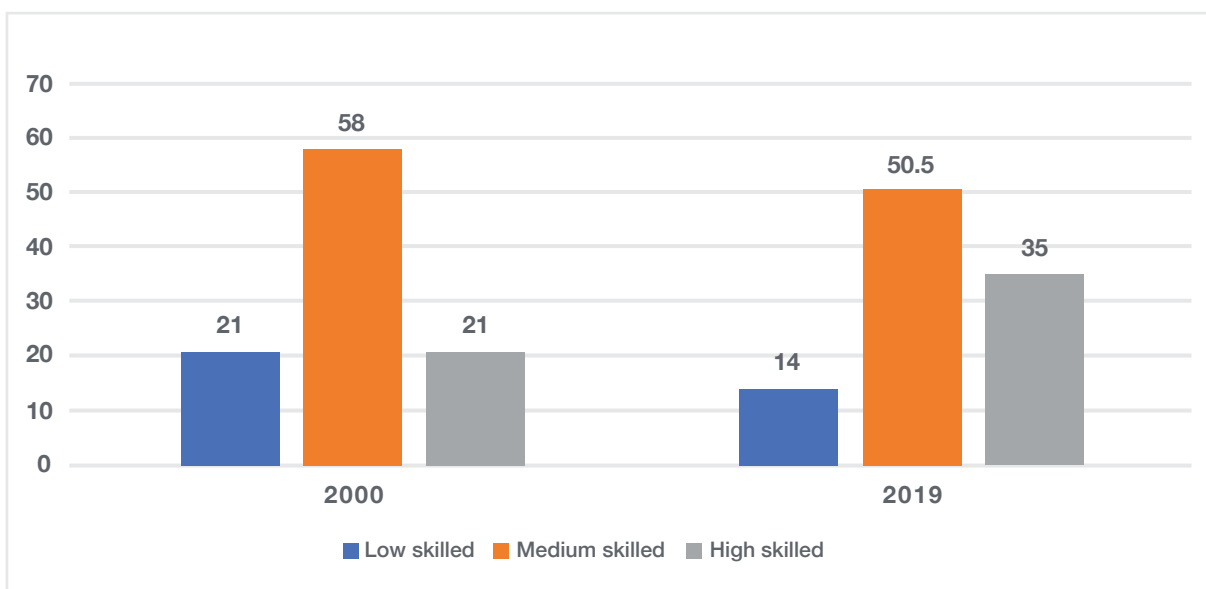
Employment expansion was the main driving force behind rising growth rates over this period; which shows a structural obstacle to higher value-added economic activity in Dubai’s workforce productivity. Taking Singapore as a benchmark; the country’s workforce consists of 54.3% highly skilled labor relative to Dubai which classifies only one third of its labor force as such⁴. Highly skilled workers are fundamental to support the readiness of the economy in both technology adoption and transition towards a digital-economy.

FIGURE 2: CONTRIBUTIONS OF LABOR, CAPITAL, AND TFP TO DUBAI’S GROWTH RATE



Source: Authors’ calculations and Dubai Statistics Center

FIGURE 4: % DISTRIBUTION OF EMPLOYED PERSONS BY SKILL LEVEL IN DUBAI,



Source: Dubai Labor Force Survey

⁴ Dubai Statistics Center, “Dubai Labor Survey 2019”, accessed July 5, 2021 https://www.dsc.gov.ae/Report/DSC_LFS_2019_02_01.pdf.

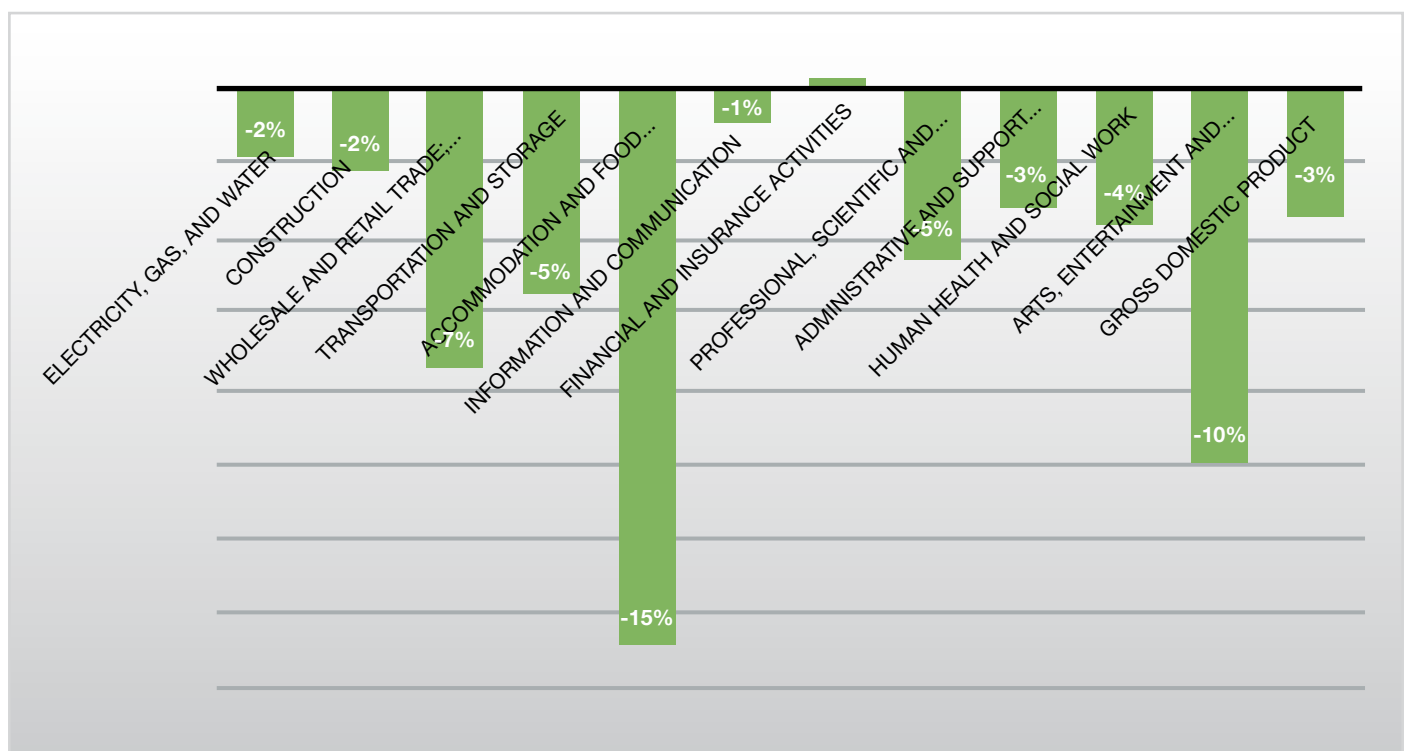
The Covid-19 Pandemic and Dubai Economy

The Covid-19 pandemic has caused great disruption to normal economic activity. To limit the spread of the virus, the UAE government imposed restrictions on public movements that constrained normal economic activities, travel, tourism, and households' consumption. The disruption in economic activity was reflected in GDP figures. The Dubai Statistics Center estimated Dubai's economic shrinkage at 10% in the first half of 2020.

Meanwhile, the Central Bank of the country projected an overall GDP growth contraction of 5.2%. While the UAE's non-oil/non-hydrocarbon component represents 40% of the country's GDP, it was also faced by a 4.5% drop in 2020.

With respect to Dubai's population growth, the Emirate maintained a slower than normal pace in that regard. According to the Dubai Statistics Center, Dubai's population size grew from 3,356,317 at the start of 2020 to 3,359,256 by September.

FIGURE 5: DUBAI ECONOMIC PERFORMANCE, BY SECTOR, IN Q1 2020



Source: Dubai Statistics Center

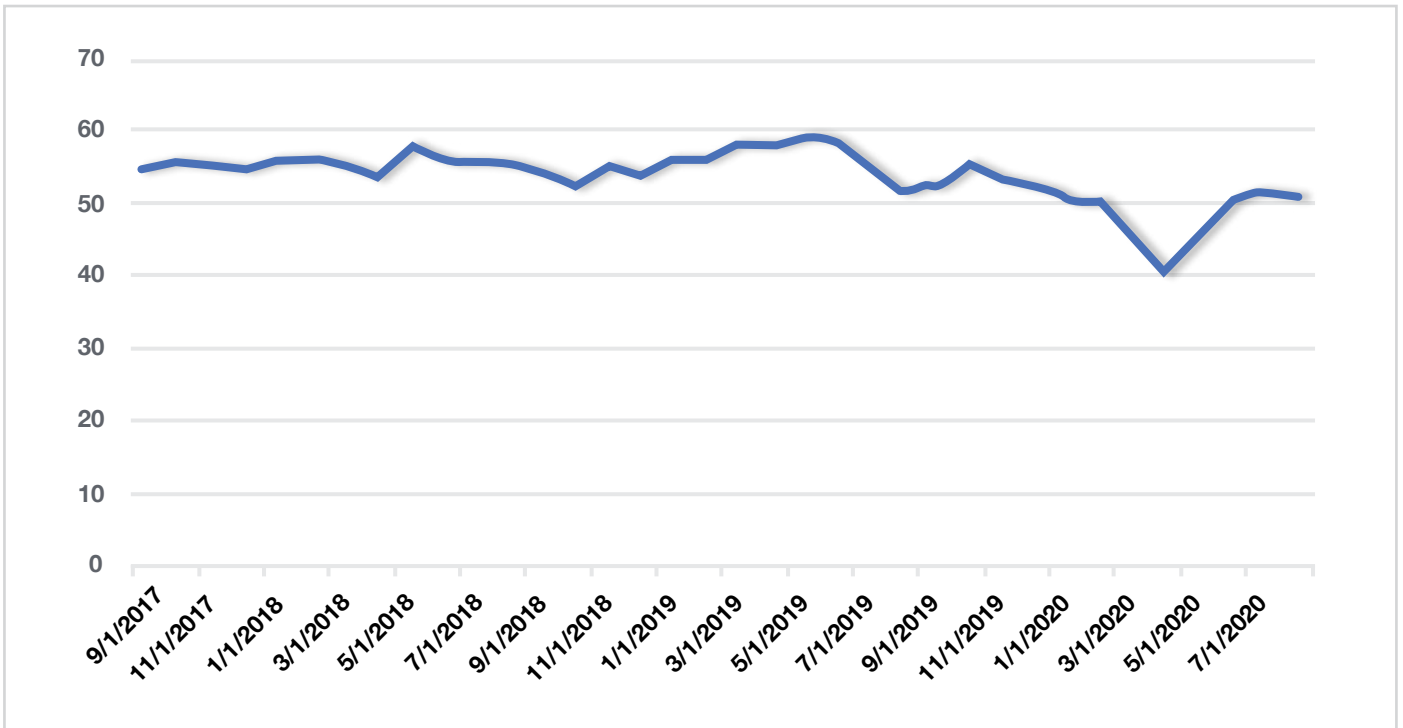
Despite that, the first half of 2020 was marked by a contraction in private sector activity and job cuts. The Emirate's Purchasing manager index (PMI), a measure of non-oil private sector activity and investors' sentiments, showed that Dubai's economy started to recover in August as the value of its PMI exceeded 50 mark, which signifies growth, for the first time since March 2020

While Y-o-Y Inflation has been negative throughout 2019, the subdued domestic demand

triggered by the pandemic in conjunction with the appreciation of the dirham (AED) price versus the trading partners currencies, as measured by the nominal effective exchange rate (NEER), has deepened the deflation rate in 2020.

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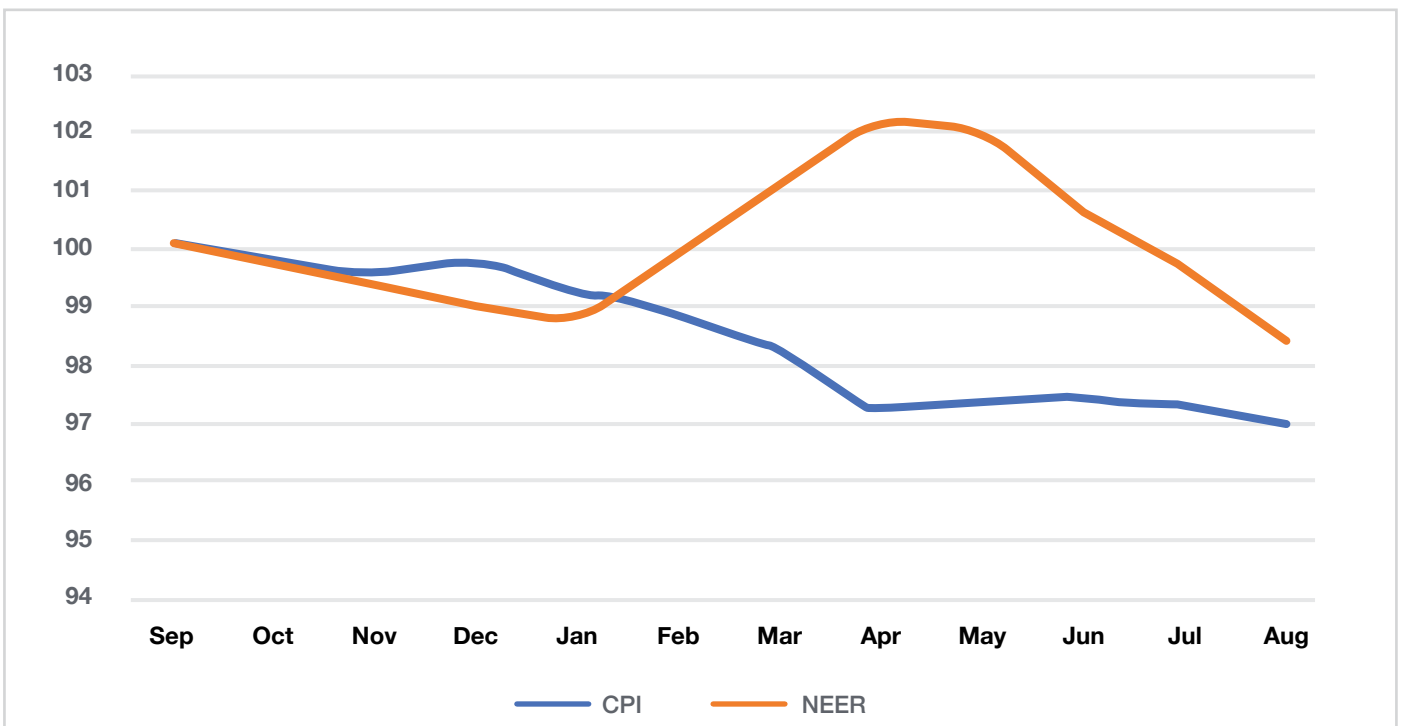
FIGURE 6: DUBAI PMI



Source: IHS Markit

While Y-o-Y Inflation has been negative throughout 2019, the subdued domestic demand triggered by the pandemic in conjunction with the appreciation of the dirham (AED) price versus the trading partners currencies, as measured by the nominal effective exchange rate (NEER), has deepened the deflation rate in 2020.

FIGURE 7: DUBAI CPI AND NEER IN 2019-2020



Source: Dubai Statistics Center and International Bank for Settlements

The Fourth Industrial Revolution and Jobs: Will This Time Be Different?

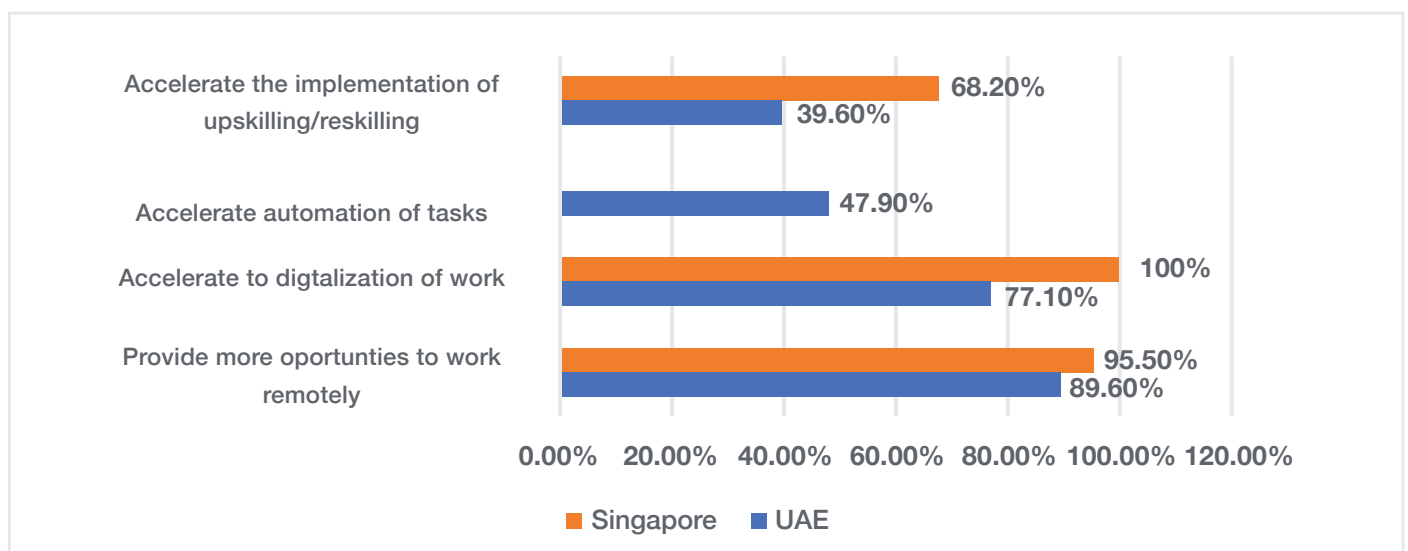
Fear of technological change is nothing new. Yet, in reality, past industrial revolutions did not have a sweeping impact on the labor market and have ended up creating more jobs than they have destroyed. While we are on the cusp of the fourth industrial revolution that includes new disruptive technologies as artificial intelligence, Blockchain, robotics, 3D printing, genomics, and disturbed power system, the key question becomes now: Will this time be different? The lessons of the past may not necessarily apply to the future. In 2018, the World Economic Forum’s (WEF) has attempted to tackle this question. WEF as well as OECD anticipates the fourth industrial revolution will generate demand for millions of new jobs. The World Bank expects that technological innovation and the fourth industrial revolution would bring higher income and improved quality of life in the long term (Chuah *et al.* 2018). However, in the short and medium-term the disruption in the labor market could be severe. For example, Frey and Osborne (2017) estimated that about 47 percent of total US employment is susceptible to computerization.

Before the pandemic, WEF estimated a figure of 133 million new jobs⁵ and whole new occupations

will be created in the coming years compared to the displacement of 75 million jobs over the same period. The emergence of the Covid-19 pandemic does not invalidate the WEF’s argument that technological disruption will lead to growing employment opportunities in the aggregate. On the contrary, Covid-19 pandemic has accelerated the use of disruptive technologies in several sectors. For example, virtual-care technologies are widely used in China. Robots are being used to disinfect hospitals. In the education sector, learning apps and online tutoring has experienced a 60% increase in the number of new users. As such, it is expected that the demand for routine and manual workers will diminish in the future while the demand for the highly skilled will increase.

The WEF identifies seven emerging professional clusters with evolving prospects in the future of work⁶: Data and AI; Care Economy; Green Economy; Engineering and Cloud Computing; People and Culture; Product Development, and Marketing and Content. It is expected that the “Care Economy” (which involves special care services for people like old age) will have the lion’s share of the emerging opportunities followed by sales, marketing, and content⁷. As such, the biggest change from the fourth revolution is not employment contraction, rather the transformation in the labor market concerning the types of jobs demanded and the future looked-for skills.

FIGURE 4: % DISTRIBUTION OF EMPLOYED PERSONS BY SKILL LEVEL IN DUBAI,



Source: WEF

5 WEF, “The Future of Jobs Report 2020”, October 2020, World Economic Forum, accessed July 5, 2021, http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

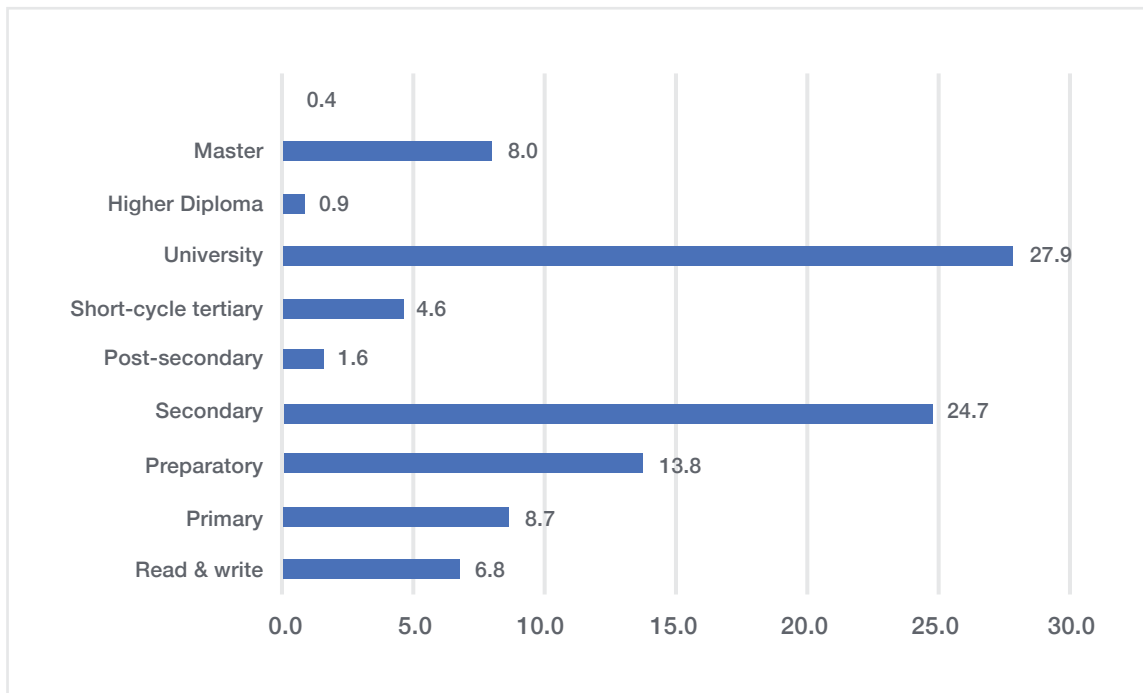
6 WEF, “The Future of Jobs Report 2020”, October 2020, World Economic Forum, accessed July 5, 2021, http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

7 WEF, “Jobs of Tomorrow Mapping Opportunity in the New Economy”, January 2020, World Economic Forum, accessed July 5, 2021, http://www3.weforum.org/docs/WEF_Jobs_of_Tomorrow_2020.pdf

How will the Technological Change impact Dubai?

The upcoming technological disruption can spur a process of economic transformation and polarization of the labor market. It will reduce the reliance on low and medium-skilled workers. Nevertheless, Dubai can emerge as a beneficiary of technological innovation. According to the Dubai Statistics Report and Labor Survey of 2019, the majority of employed persons are medium-skilled workers. Hence, with technological replacements, Dubai could be in a position to take full advantage of technological development and productivity gains.

FIGURE 8: % OF EMPLOYED PERSONS BY EDUCATIONAL LEVEL-DUBAI



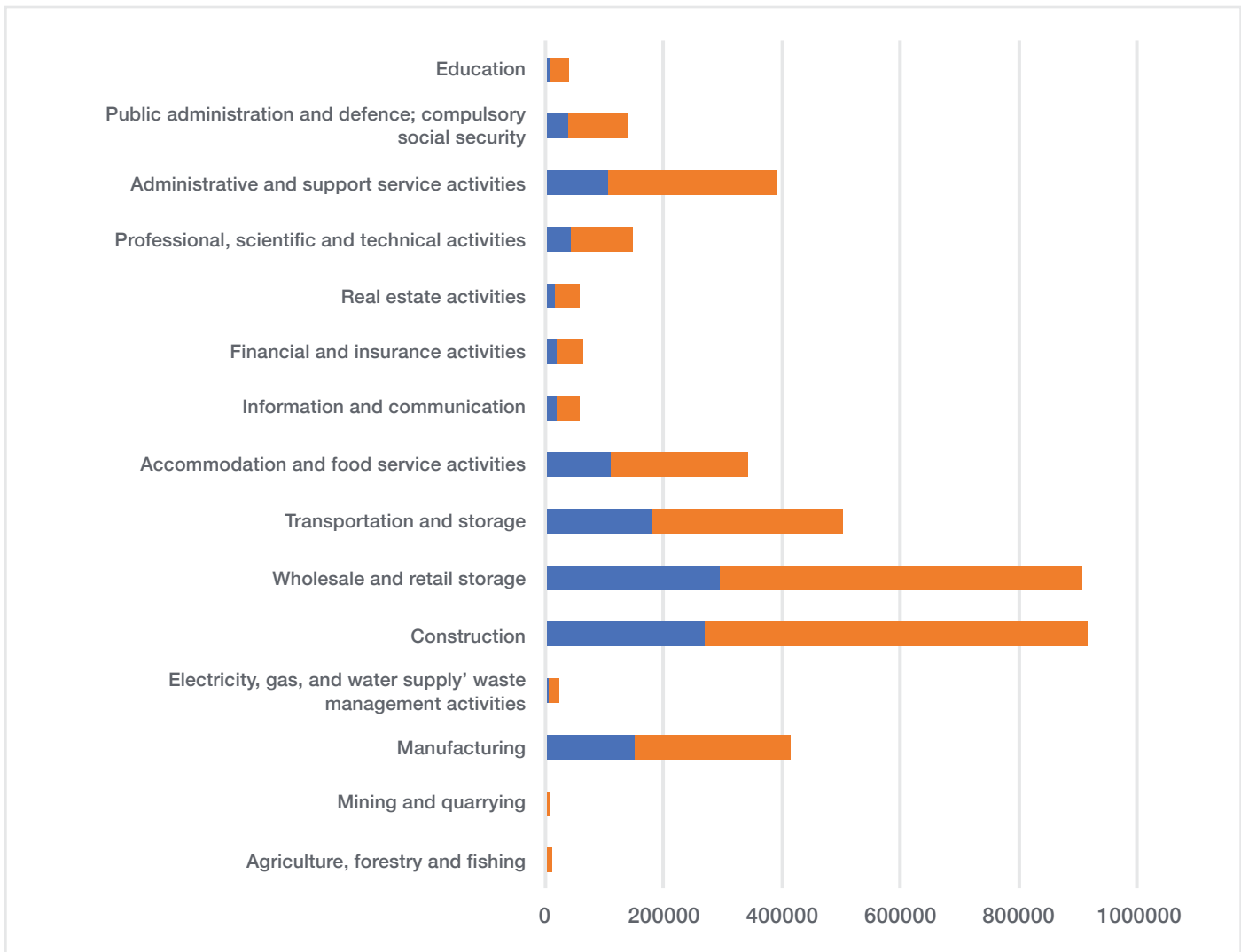
Source: Dubai Statistics Center

As previously discussed the technological disruption would call for the creation of new occupations while significantly decreasing demand for others. Frey, C. B., & Osborne, M. A. (2017) used a novel methodology to examine how susceptible jobs are to automation in the US labor market. They looked at 702 detailed occupations in the US. They concluded that about 47% of total US employment is at risk.

McKinsey Global Institute (MKI) has extended the model of Frey, C. B., & Osborne (2017) to the MENA region. It was estimated how many jobs could

be replaced with machines in Dubai. The calculation built on the work of Frey, C. B., & Osborne, M. A. (2017) and MKI. Combining 2019 Dubai's Labor Force Survey with the parameters from MKI allows us to apply the potential for automation at the sectoral level as shown in the following figure. The parameters included five main capabilities which included sensory perceptions, cognitive capabilities, natural language processing, social and emotional capabilities, and physical competencies. In aggregate, we find that about 44% of jobs (1.3 million) in Dubai are susceptible to automation⁸.

⁸ Moore, et. al., "The Future of Jobs in the Middle East", January 2018, McKinsey & Company, accessed July 5, 2021, <https://www.mckinsey.com/~media/mckinsey/featured%20insights/middle%20east%20and%20africa/are%20middle%20east%20workers%20ready%20for%20the%20impact%20of%20automation/the-future-of-jobs-in-the-middle-east.ashx>

FIGURE 9: NUMBER OF JOBS SUSCEPTIBLE TO AUTOMATION IN DUBAI BY SECTOR

Source: Authors calculations, Labor Force Survey and McKinsey Global Institute

It is obvious from the figure the potential for automation is not uniform across different sectors. Sectors that are intensive in routine and codifiable tasks, usually done by low and medium-skilled workers, such as construction, transportation, manufacturing, warehousing, and food services are at high risk of automation. Cafes operated entirely by robots have already opened up in Dubai. On the other hand, sectors are dependent on human interactions, creativity, and problem-solving such as education, healthcare, arts, and entertainment are less susceptible to automation. Looking at the four main sectors in Dubai's economy, wholesale and retail, construction, transport, and manufacturing, the creative disruption can result in a large restructuring of the labor market.

Cost-minimizing firms would always choose the low-cost factor of production over the high-cost factor. Pritchett (2020) argued that technological change is not an exogenous yet mainly driven by the labor cost in the rich industrial countries. All the advanced

economies have created policies that restrict labor mobility and disrupt the inflow of labor to their lands which in turn limits the availability of low and medium-skilled workers in these countries. So, when Walmart, a low wage employer, invest in technology that displaces low or medium-skilled labor, it is driven by the high cost of labor in these countries.

Dubai adopted a different strategy, it sets low barriers to maximize the gains from free labor mobility that does not distort wages from the market price or inflate the cost of labor. On one hand, this policy allows Dubai to take full advantage of the free market system, on the other hand, it has slowed the process of capital accumulation and technological adoption. Table 3 shows the wage differential between workers with similar productivity levels in Dubai and in their home countries. We estimated the median wage in Dubai using the 2019 Dubai Labor Force. Due to data limitations, it was not possible to break down the median wage in Dubai by nationality.

FIGURE 9: NUMBER OF JOBS SUSCEPTIBLE TO AUTOMATION IN DUBAI BY SECTOR

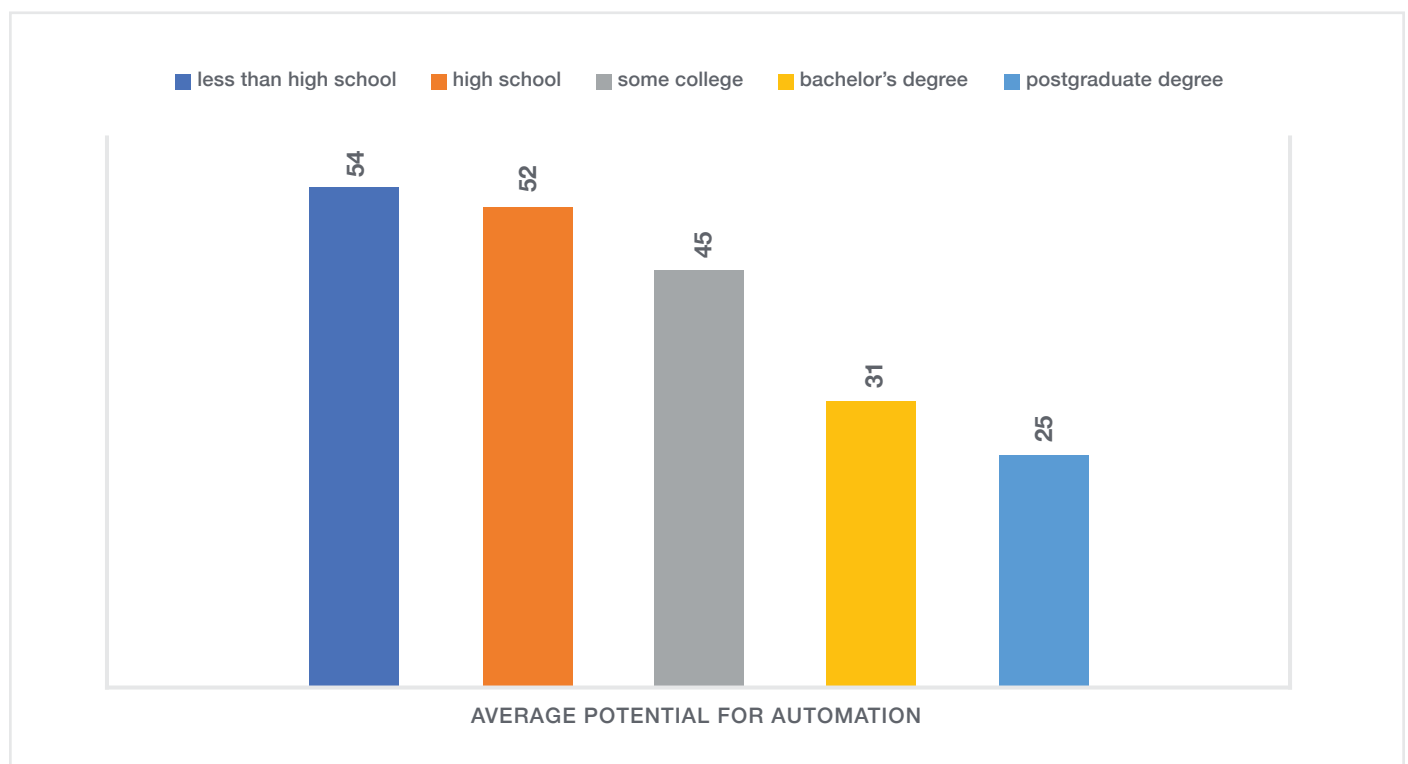
Country	The median annual income of a low skilled worker in Dubai - irrelevant to nationality	The annual wage in the home country	Gains from moving to Dubai for low-skilled
India	\$5,439	4,021	\$1,418
Nigeria	-	1,186	\$4,253
Egypt	-	1,712	\$3,727
Vietnam	-	2,624	\$2,815
Indonesia	-	3,423	\$2,016

Source: Authors calculations, 2019 Labor Force Survey and Prichett (2020)

The Brookings institution looked at how technology and AI would affect people with different educational attainments. The Brookings institution finds an inverse relationship between the potential for automation and education. In other words, automation decreases with a higher level of education sparing disproportionately

the higher-skilled. Occupations that require lower education-roles are at the highest risk of automation. By contrast, jobs that require higher education-roles such as engineering face a limited risk of automation. The next figure describes the average automation potential by worker educational attainment.

FIGURE 10: AUTOMATION POTENTIAL IS HIGHEST FOR WORKERS WITH SCHOOL EDUCATION



Source: Muro et al. (2019)

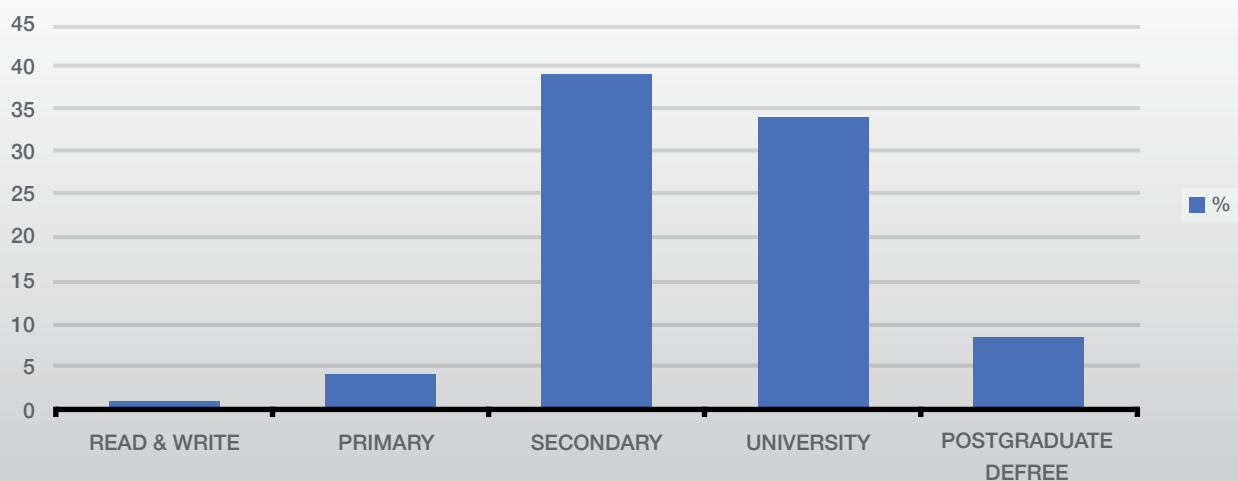
To What Extent are the Local Population Jobs Susceptible to Automation?

So, to what extent are the local population jobs susceptible to automation? A rough answer to this question is to look at the distribution of employed Emirati persons by educational level. Dubai Statistics Center data would suggest the majority (57%) of the current Emirati workforce did not go to university and consequently will see greater job change from automation.

The Brookings Institution estimated non-college workers will see 49% of their current tasks be displaced by automation.

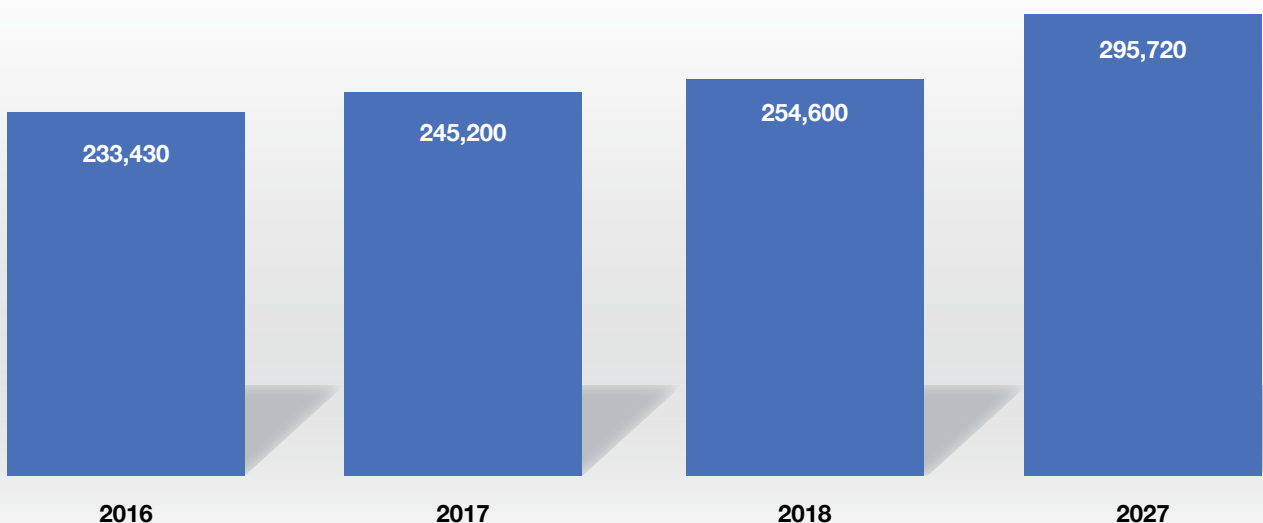
Based on the demographic statistics obtained from DSC, it is estimated that the Emirati population of Dubai to grow at the rate of 2% per year, reaching 295,270 by 2027. One can estimate between 5,000 to 6,000 Emirati to enter the labor market every year. The number of local newcomers is very small relative to the size of the labor force (about 3 million) in Dubai and can be easily absorbed in the market. However, according to the Dubai Statistics Center, the high concentration of the Emirati students (75% of Emirati students) in social science and business studies are not well aligned with the future needs of the future economy. Therefore, embracing the culture of lifelong learning skills for employment among Emirati citizens would be highly desirable.

FIGURE 11: % DISTRIBUTION OF EMPLOYED EMIRATI BY EDUCATIONAL LEVEL IN DUBAI



Source: Dubai Statistics Center

FIGURE 12: POPULATION PROJECTION FOR LOCAL POPULATION IN DUBAI

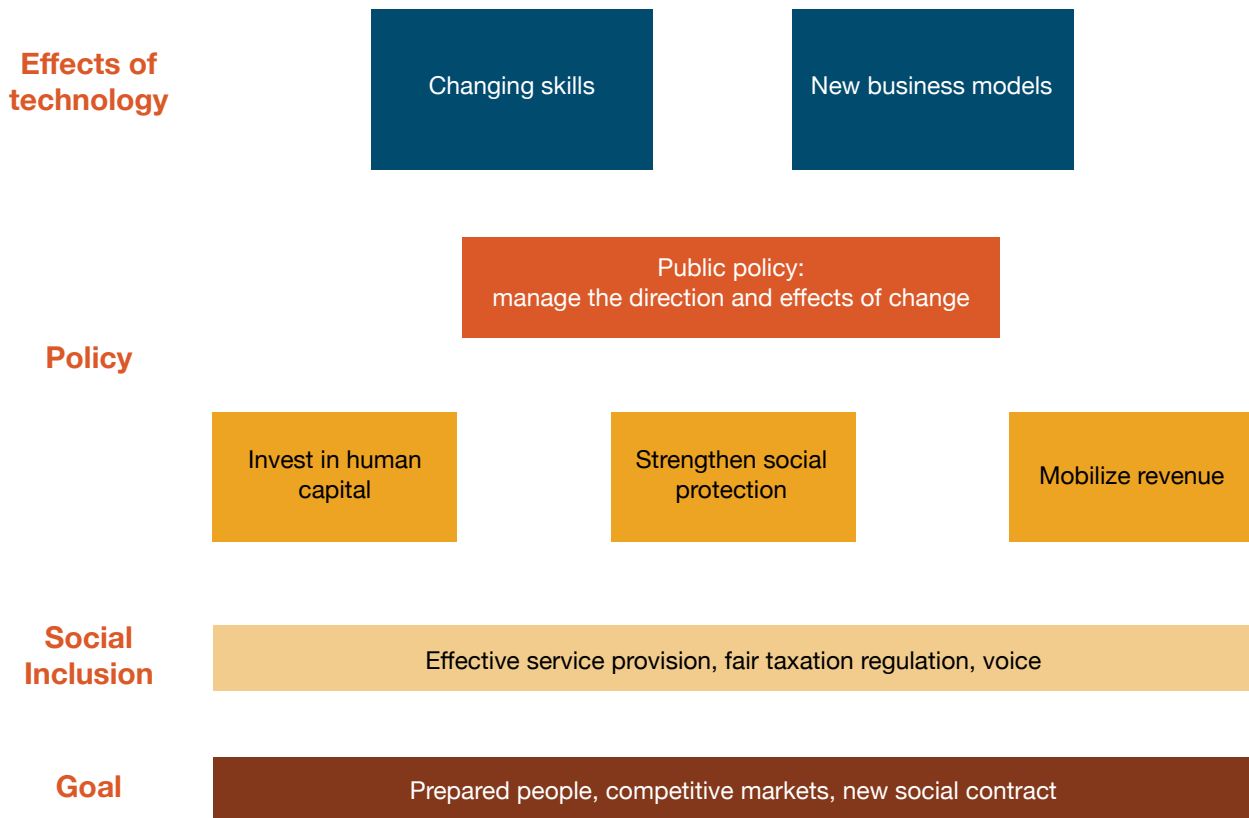


Source: Authors calculations and Dubai Statistics Center

What Policies are Needed?

This section looks into policies to facilitate technology adoption to increase productivity. Dubai's economy is rather dynamic and in a position to seize tremendous benefits from technological change.

If the right incentives are provided, the fourth industrial revolution could promise Dubai's economy significant gains in productivity and welfare. Policies that embrace AI and automation, and capital deepening should be adopted. In contrast, policies that slow down the deployment of automation and AI would be counterproductive. As shown below, the World Bank gives a broad recommendation to deal with the effects of technology.



We suggest the following policies to benefit from the industrial revolutions:

- **Attracting and retaining future talents**

Train and retain policy for talented international students. The policy aims to attract and keep the best international students to boost innovation and creativity. Measures to meet this objective would include providing scholarships to the best international students in Dubai universities. Allowing university students to stay in the country after graduation to seek jobs. Use active labor market policies (ALMPs) to assist them in finding jobs. This policy should be in line with Improving the international ranking of Dubai universities to serve as an attractive destination to international students.

Setting up Dubai Scientific Research Support and Technology Development Fund. A research fund with international orientation that fund and attract international/Arabs distinguished researchers to implement research projects in fields of vital concern to Dubai's economy and establish scientific partnerships with scientists from all over the world.

- **Social Protection Policies to Support Local Population**

To mitigate the impact of the technological disruption on low-skilled local workers already in the workforce, the Government of Dubai can encourage the acquisition of new skills while overcoming financial constraints to equip workers with skills for the future jobs and curb

structural unemployment. For instance, Singapore provides unconditional grants to everyone for training during their career, embracing life-long learning culture. Income redistribution policies to protect the low and medium-skilled Emirati workers. For example, unemployment compensations or Minimum Basic Income can be utilized as a social protection policy. Provide incentives to Emirati youth to work for the private sector as many public administration jobs are at risk of automation.

- **Improve the quality of the education system in Dubai**

A key conclusion from the previous analysis is that the ability of Dubai's education system and job-training system, which is rarely implemented, to provide workers with the skills to thrive in the future environment that characterized by non-routine work and problem-solving is the main challenge confronting Dubai's future. The quality of education in Dubai remains unsatisfactory. Despite the generous funding, KHDA reports suggest that public schools remain the weakest link in Dubai's education system. A policy option to reform public education is delegating the management of public schools to private providers. Findings from international experience would lend support to this policy.

- **Improving the culture of research**

The vitality of the UAE's research culture will be central to this success. There is a lot of work that needs to be done to improve the research

culture in the UAE and make the most of the wealth of talent that crosses the country. As an initial step, the evolution of UAE research culture must ensure assessment systems and processes that are fair, efficient and free of bias, eradicating disparities to ensure a system as meritocratic as possible. Equality, diversity and inclusion are critical aspects of research culture and improving them requires a multifaceted response. The UAE will need to develop bold initiatives to increase the participation, retention and promotion of a diversity of talent into Research and Development (R&D). To do so, necessary measures will need to be implemented such as reducing ineffective bureaucratic practices and endorsing more transparency and accountability while establishing research targets and standards. These measures will ensure that research and innovation will benefit from a pool of diverse and innovative talents that will have the motive to stay. Furthermore, special emphasis will need to be devoted to the technical workforce. The latter is an indispensable prerequisite to research and innovation as it could add to the UAE's reservoir of new knowledge and develop national infrastructures that will assist in training future researchers and innovators.

With the recent upheavals faced due to the COVID-19 pandemic, the UAE government will need to revisit its government-funded researcher productivity and portfolios. This will entail setting clear expectations of research organizations in supporting safe and open research cultures that lead to high integrity of research.

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The Mohammed Bin Rashid School of Government

The Mohammed Bin Rashid School of Government (formerly Dubai School of Government) is a research and teaching institution focusing on public policy in the Arab world. Established in 2005 under the patronage of HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the United Arab Emirates and Ruler of Dubai, in cooperation with the Harvard Kennedy School, MBRSG aims to promote good governance through enhancing the region's capacity for effective public policy.

Toward this goal, the Mohammed Bin Rashid School of Government also collaborates with regional and global institutions in delivering its research and training programs. In addition, the School organizes policy forums and international conferences to facilitate the exchange of ideas and promote critical debate on public policy in the Arab world. The School is committed to the creation of knowledge, the dissemination of best practice and the training of policy makers in the Arab world. To achieve this mission, the School is developing strong capabilities to support research and teaching programs, including:

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- Master's degrees in public policy and public administration;
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3. Health Policy
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6. Sustainable Development Policy
7. Economic Policy

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Future Government and Innovation

The emerging domains of research within this theme includes digital-era societal transformations, technology policy, innovation policies, big data and governance, artificial intelligence in government, open government data, "smart cities" and future of urban development, cybersecurity policies, inclusion and citizen-government interactions in the digital age, the ramifications of the "Fourth Industrial Revolution", among others.



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