Lebanon at a skills crossroads:

big data insights into labour market demand

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[redacted] big data insights into labour market demand after six years of crisis

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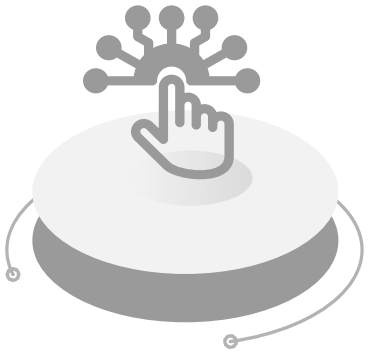
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Key messages and policy recommendations



1. Economic and digital stabilization

The online labour market in Lebanon is centred on conventional business and service skills, especially marketing, accounting and finance, alongside communication, sales and management. Frontier skills such as AWS serverless, code generation, prompt engineering and large language modelling are among the fastest emerging.

Policy response

Advance fiscal, monetary and governance reforms while strengthening electricity and digital infrastructure to foster a more conducive environment for investment and digital sector growth.



2. National digital and skills strategy

Lebanon is witnessing emerging demand for digital, artificial intelligence (AI) and Fourth Industrial Revolution skills, but the continued outflow of skilled information and communication technology (ICT) talent has contributed to declining ICT demand, reducing the sector's capacity to support sustained productivity and economic growth.

Policy response

Adopt a national ICT and digital skills policy that integrates tech hubs and talent retention, and a national skills intelligence platform to convert fragmented digital demand into sustained job creation and economic growth.

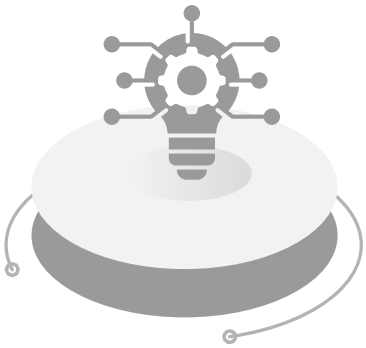


3. Education–labour market alignment

Rapidly changing skill requirements are challenging the responsiveness of learning institutions, underscoring the need to better align education and training systems with evolving labour market demand.

Policy response

Implement data-driven skilling, reskilling and upskilling programmes aligned with real-time labour market needs, while simplifying curriculum approval processes to enable universities to respond more rapidly to changing skill demand.



4. AI and workforce transformation

AI shows moderate-to-high augmentation potential, especially in analytical and professional occupations, although digital readiness remains at an early stage of development.

Policy response

Integrate AI literacy, data skills and practical AI tools into education and lifelong learning, so that AI can increase productivity rather than exclusion.

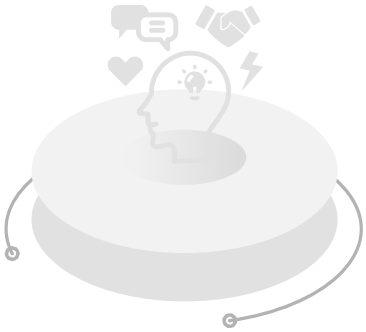


5. Talent retention and new work models

Lebanon continues to experience the outflow of skilled talent, while limited adoption of remote work constrains opportunities to better leverage its highly skilled workforce in response to growing global demand.

Policy response

Develop tech hubs, innovation ecosystems and remote/hybrid work frameworks to retain talent and link Lebanese skills to global markets.

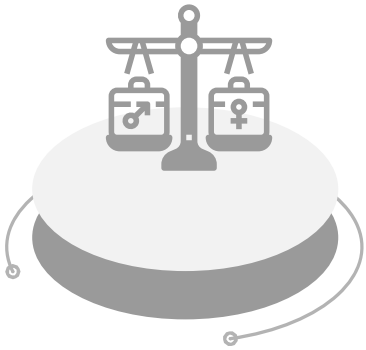


6. Institutionalized skills intelligence

Traditional labour statistics are weak, while big data and online job postings provide reliable real-time insights for policy design. While traditional labour market statistics remain limited in timeliness and granularity, big data and online job postings can provide valuable real-time insights to support evidence-based policymaking.

Policy response

Establish a national skills intelligence platform integrating official labour market statistics, big data, education outputs and training results to generate timely, comprehensive and evidence-based insights for policymaking and skills planning.



7. Gender-sensitive employment

Although 69 per cent of online job advertisements do not specify a preferred gender, 28 per cent request female candidates compared with only 3 per cent requesting male candidates. Among advertisements that do specify gender, female candidates account for more than 85 per cent of demand across the top 20 occupations, particularly in clerical, sales and customer-facing roles such as administrative assistant, sales assistant, cashier, hostess, receptionist and secretary.

Policy response

Engage in gender-sensitive recruitment practices and invest in targeted training and support measures that enable women to move beyond traditionally female-dominated roles into technical, managerial and higher-productivity occupations.

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Introduction

Technology is revolutionizing labour markets everywhere by changing the skill requirements of jobs, displacing roles, creating new occupations and hybridizing others. These technological changes are creating new demand while increasing the need for continuous skills development.[1] According to the 2025 World Economic Forum (WEF) Future of Jobs report,[2] an estimated 39 per cent of workers' core skills will be disrupted by 2030 globally, 92 million jobs will be displaced by 2030, while 170 million jobs will be created. The 2023 WEF report analysed the expected impact of technology on employment, and the results showed that all technologies, except humanoid and non-humanoid robots, are expected to create jobs over the next five years.[3] According to the World Development Report (2019), technologies are affecting how firms operate, creating new business models and expanding job opportunities.[4] The skill sets that are in high demand today did not exist five years ago, and the pace of this trend is expected to accelerate. A report from the National Skills Coalition[5] reveals that most jobs today require some type and level of digital literacy and skills. As much as digital skills are needed for most jobs, digital jobs are also in high demand. An Organisation for Economic Co-operation and Development (OECD) report[6] has also studied the growth of such jobs, highlighting the significant growth in digital occupations and the need to acquire diverse digital skills.

In this rapidly evolving landscape, the dynamic assessment of skills needs has never been more crucial. As technology reshapes industries and generates new employment opportunities, the demand for a specific skill set is constantly changing. To leverage the opportunities that such technological changes bring to the employment landscape and to mitigate negative outcomes (such as increased unemployment and underemployment), it is key to prepare the workforce for the skills required for the jobs of the future. Moreover, traditional methods of identifying the workforce requirements are proving insufficient in the face of such rapid changes. The emergence of big data, a powerful tool with the potential to understand and pinpoint the evolving skills in-demand, is more useful than ever. This data-driven approach allows for real-time, dynamic insights and enables policymakers to tailor strategic workforce planning, businesses to refine their hiring methods, and educators to adapt training programmes, ensuring that the workforce is well equipped to meet the demand of the constantly evolving job landscape. Big data provides the information needed to better identify evolving skills and employers' needs. This access to information is particularly valuable in developing countries where labour market information systems and statistical data ecosystems may be less developed. Given variations across countries in the Arab region in the frequency, coverage and timeliness of statistical data collection, alternative data sources, including big data, offer a cost-effective and timely means of complementing official statistics and providing additional insights into rapidly evolving trends. In the present paper, big data and the ESCWA Skills Monitor (ESM) are utilized to fill information gaps and better understand the Lebanese labour market.

1

Background

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The Lebanese labour market stands at a crossroads after six years of significant economic and social challenges. Beginning with the financial crisis in 2019, followed by the COVID-19 outbreak, the 2020 Beirut Port explosion and the Israeli war, the country has witnessed widespread job and income losses. One of the major impacts of these events on the labour market was soaring unemployment at around 30 per cent in 2022, up from 11.4 per cent in 2018–2019,[7] accompanied by a continuous outflow of skilled workers.

Given this strain on the country's social and economic fabric, Lebanon faces a fundamental question: what is the current state of labour-force competencies, how have skills evolved following recent socioeconomic shocks, and to what extent can they support a sustainable labour market recovery? In framing any recovery plan, it is essential to understand the dynamics of the most in-demand skills and identify those that are declining in demand. The present paper aims to address these questions by assessing the Lebanese skills landscape, with a particular focus on the most demanded versus declining skills over the past five years.

While Lebanon passes through severe economic fluctuation, the nature of work is transforming under an accelerating technological wave. The rapid digitalization driven by the Fourth Industrial Revolution is fuelling growing demand for both digital and interpersonal (human-centric) skills. These shifts create important opportunities for individuals and sectors that can adapt to new technologies, while posing significant challenges for those at risk of being left behind. This tension between adaptation and exclusion defines much of the country's current labour market reality.

Despite years of economic contraction, Lebanon cannot overlook the technological transformations reshaping labour demand and the nature of work. Against this backdrop, the present paper examines the intersection between technology and labour-market development. Drawing on data from online job vacancies, it aims to highlight emerging trends in skills demand, focusing on the evolution of private-sector requirements over the past six years.

In particular, the present analysis underscores two key points about using big data for labour market insights. Firstly, even in data-scarce environments like Lebanon, online job postings are an available (and underutilized) source of rich information on current skill demand. Secondly, the labour market is rapidly evolving, and demanded skills can change quickly, making a real-time monitoring tool highly valuable. By mining this online data, the most in-demand skills and occupations in Lebanon today can be identified, helping to illustrate the relationships between different skills and occupations. This analysis can

provide insights into which skills have seen the greatest growth in demand, which may be at risk of augmentation due to AI technology and other relevant trends in the Lebanese labour market. Such information can directly inform skilling, reskilling and upskilling programmes. For example, public employment services and training institutes can use these findings to trace skill gaps, design training and short-term courses that address current gaps, or advise investments in specific sectors to absorb national talents. Ultimately, the goal is to support evidence-based policymaking to ensure that workforce development initiatives are tightly aligned with the needs of employers in a rapidly changing economic landscape.

Chapter 2 introduces the concept of using big data for labour market and skills analysis. It defines what is meant by big data in this context and discusses its advantages and limitations, comparing it to more traditional sources of labour information. It also describes how the ESM has been fulfilling that role in the Arab region by providing information on the process and characteristics of the data and insight it produces. Chapter 3 focuses on Lebanon, describing the country's recent socioeconomic challenges and key labour market trends over the past six years. This provides critical context on demographics, unemployment, informality and other challenges that form the backdrop for the present skills demand analysis. Chapter 4 analyses the country's skills profile using ESM data. The chapter presents findings on the top occupations and skills in demand in the Lebanese online job market, visualizes the "skills forest" network illustrating how jobs are connected through shared skills, and examines trends in skill demand by identifying which skills are rising (emerging skills) and which are declining (decaying skills) between 2020 and 2025. The paper concludes with a summary of insights and policy recommendations.

2

Big data: reshaping labour market and skills analysis

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The transformative potential of big data analysis is evident across various domains, offering numerous advantages.[8] The main advantages can be summarized as follows: access to a vast volume of near real-time information; time and cost efficiency, as it eliminates the expensive, lengthy and complex process of data collection given that the information is continuously updated; detailed insights into skills and skill needs across and within different units (such as countries and occupations); and the authenticity of information, as data collected from individuals online is generally considered more "truthful" because it is based on actual behaviour.

Big data provides increased granularity and allows for the detection of new emerging occupations and skills. Big data analysis, including of online job advertisements, allows for the detection of newly emerging, and current but changing, occupations and skills through AI.[9] The labour market knowledge generated by analysis can be used to identify new (potential) emerging occupations, by exploiting unsupervised learning techniques and identifying the changing skills composition of current occupations. Such analysis can support policymakers working on reskilling to better understand the skills that they should focus on and those that they should stop training or train differently. This can be done by looking at the top skills associated with a certain occupation over time. Data extracted online can be turned into knowledge that informs policy design and evaluation through evidence-based decision making.

Despite the advantages outlined above, it is important to acknowledge the challenges and limitations associated with big data analysis. The need for experts and technical skills for extraction, standardization and analysis of data can be challenging,[10] since big data without interpretations may overlook important contextual factors. The technological constraints of data collection, often requiring advanced technological tools and infrastructures, can sometimes limit the analysis. Analysis can even be confounded by the selected taxonomy or clustering model, or there can be partial occupational skills profiles. The limitations of such analysis can be summarized in three main points:[11] data quality and representativeness, as the data may be incomplete, fail to capture the full job profile, be biased or inaccurate, or contain errors such as duplicates; data privacy and protection, which raise legal and ethical concerns as data collection and use must comply with applicable laws and regulations; and demographic coverage, since big data may not adequately represent all population groups and may be biased towards certain demographic segments.

Assessment of skills across jobs demanded in the Arab region

ESM collects and monitors real-time skills demanded in 20 Arab countries,[12] from over 180 regional and national online job posting platforms. With millions of online job posting observations, ESM helps different audiences such as policymakers, researchers, and job seekers understand the region's labour market demand and track the relevance of skills and the region's employment prospects.

More than 4.7 million online job postings[13] have been recorded and analysed in ESM since 2020. These postings were cleaned[14] and stored in the database as a set of text fields, containing all relevant information as seen online. An overview of the ESM workflow is shown in figure 1. ESM extracts relevant information from the text, classifying it into a set of designated fields for analytic purposes, with the help of natural language processing (NLP) methodologies. The fields stored in the monitor cover a wide range of analytical issues across labour market studies.

ESM analyses job titles and extracts skills from online postings. Its first analytical focus is job titles, collected directly from online postings. To ensure meaningful analysis, it is important to curate job title data into a single taxonomy of normalized categories or groups.[15] ESCWA used the International Standard Classification of Occupations (ISCO-08) and European Skills, Competences, Qualifications and Occupations (ESCO)

Figure 1. ESM workflow

Source: Compiled by ESCWA.

occupation taxonomy for the normalization.[16] The second outcome of interest is skills. While job titles are directly observed from job postings, skills demanded are often not directly mentioned in the context. Instead, the job description of the advertised vacancy must be studied, and the required skills must be extracted or derived from the job description context observed.[17] Like job titles, skills taxonomy is also normalized into a hierarchy consisting of over 30,000 unique skills that can be categorized into hard and soft skills. Hard skills are abilities primarily applicable to a specific group of occupations or are necessary for performing a particular task. Examples include Python or accounting. Common or soft skills are more related to interpersonal abilities found across a broad range of occupations and industries, such as communication or planning.

Compared with traditional data sampling and analytical methods, ESM offers significant advantages, including a large volume of observations, the real-time nature of the data, and single-taxonomy normalization, which enables analysts and researchers to make meaningful comparisons across countries in the region. However, these strengths do not eliminate the need to consider several caveats when using and interpreting the data. The interpretation of ESM data must take into account its specific characteristics. Firstly, ESM began collecting data in 2020, with limited observations available prior to that year. Secondly, ESM is strictly a demand-side monitor and does not provide direct information on the supply side of the labour market. Thirdly, because ESM collects data exclusively from online job platforms, the results may be biased if interpreted as reflecting overall labour market demand. More precisely, the findings should be understood as representing demand in the online job market rather than total labour demand across the economy.

The online market interpretation restriction can be relaxed for the skill profiling for each occupation. It is reasonable to assume that the skills demanded for most occupations are consistent whether a vacancy is posted online or offline. A representative skill profile for an occupation can be obtained with many vacancy observations relevant to this occupation. Although the skills required for an occupation can vary across vacancies, the aggregation of skills demanded across these vacancies in the same occupation will reveal the most repeated skills in the demanded online job announcements, which offers a reliable representation of a robust skill profile for that occupation consisting of the top demanded skills in that occupation.

The opportunities big data can provide in measuring and understanding various socioeconomic phenomena are especially helpful in countries with a limited statistical and data ecosystem. Many countries tend to not consistently conduct surveys, have proper and updated registries, and gather enough information for monitoring and public policy-building. Resorting to big data insight, while understanding its limitations, can be a fruitful shortcut to understanding various socioeconomic fluctuations. Countries like Lebanon, which has passed through several political, social and economic challenges in the past six years, can benefit from such insight to understand the practical impact of these blows in a granular, accurate and cost-effective manner, in an effort to design policies that address these challenges.

3

Case of Lebanon: six years of socioeconomic shocks

A. Economic and social overview

Over the past six years, Lebanon has faced multiple challenges that have placed considerable pressure on the country's economy and society. Starting with the 2019 economic crisis, followed by the COVID-19 outbreak, the Beirut Port explosion in 2020, and most recently the 2024 and 2026 Israeli wars, these successive crises have placed immense pressure on the country's economic and social fabric, while severely undermining its prospects for growth and sustainability.

Prior to 2019, although growth was modest, Lebanon experienced a sustained expansion that kept the economy running. In 2017, real gross domestic product (GDP) reached its highest level of $51 billion,[18] while growth rates hovered at around 2.6 per cent for nearly seven years.[19] This slowdown coincided with regional instability following the Arab uprisings, the outbreak of the Syrian conflict in 2011, and prolonged presidential vacuums.

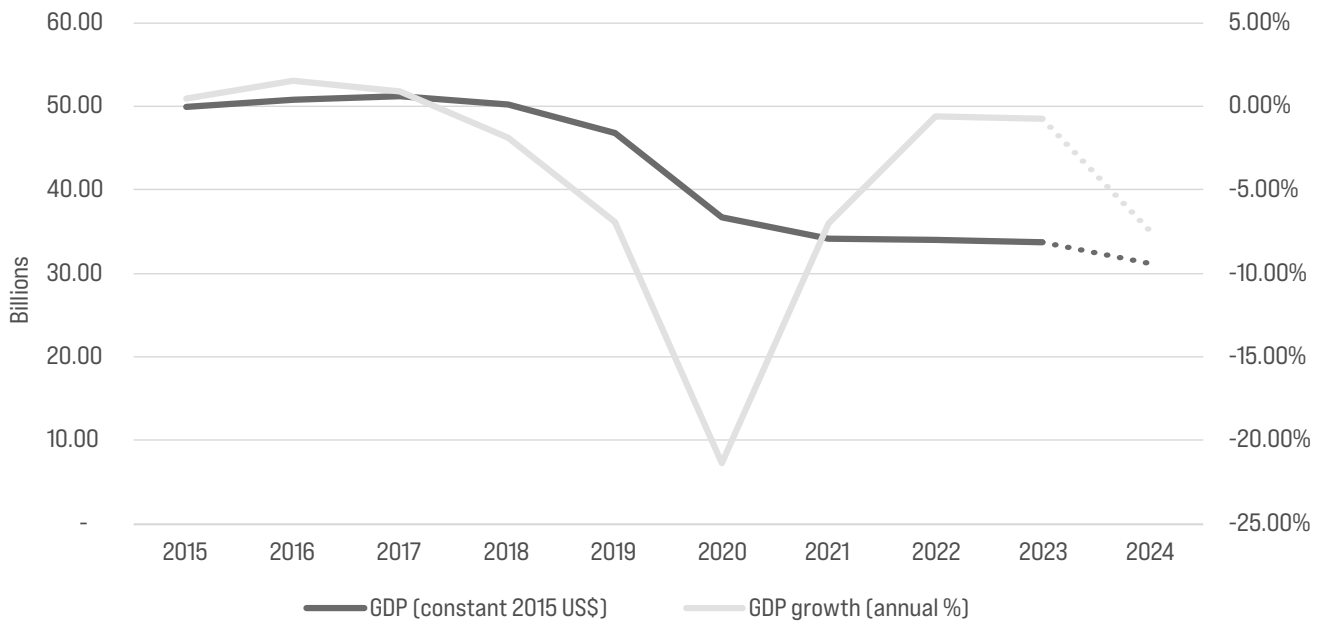
After 2017, growth turned negative even before the 2019 financial and economic crisis, contracting by 1.9 per cent in 2018 and plunging by 21.4 per cent in 2020,[20] the steepest decline since the end of the civil war (figure 2). By 2020, real GDP had fallen to around $34 billion, its lowest level in two decades.

The 2019 crisis triggered a severe depreciation of the Lebanese pound, which lost more than 98 per cent of its value and pushed inflation to record highs.[21] The country's default on its Eurobonds in 2020 further constrained investment and growth prospects. According to International Monetary Fund estimates, public debt reached around 164 per cent of GDP in 2024,[22] underscoring the depth of the fiscal crisis.

The combined effect of economic contraction and currency depreciation contributed to a substantial increase in poverty levels. According to the World Bank,[23] about 44 per cent of the Lebanese population lived below the poverty line in 2022, representing a threefold rise in poverty over the past decade. The erosion of purchasing power and limited access to basic services have deepened social vulnerability nationwide.

The aggregate GDP decline also affected income per capita. In 2018, the country's per capita income exceeded $9,000 (constant 2015 prices), ranking seventh in the Arab region above all middle-income peers except Libya. In 2019, it began to decline, recording its first contraction since 2014 (a decrease of 2.9 per cent). Over the following four years, output continued to shrink, with the sharpest decline reaching 37.4 per cent in 2020. By 2023, income per capita had fallen to $3,477, the lowest level since 1996, representing a 62 per cent

Figure 2. Lebanon: real GDP and growth rate, 2015–2024



Sources: GDP values up to 2023 are sourced from the World Bank. The 2024 GDP value is an approximation calculated by applying the International Monetary Fund's projected 2024 real GDP growth rate to the World Bank's 2023 GDP figure.

decline since 2019. This drop placed Lebanon thirteenth in the region, six positions below its pre-crisis ranking.

According to the latest annual report by the Central Bank of Lebanon (BDL), GDP contracted by 6.7 per cent in 2024, with nominal GDP estimated at $28 billion.[24] However, a more recent World Bank report indicated that the 2023–2024 conflict imposed an estimated economic cost of $14 billion on Lebanon, comprising $6.8 billion in physical damage and $7.2 billion in economic losses resulting from reduced productivity, foregone revenues and increased operating costs. The conflict was also estimated to have contributed to a 7.1 per cent contraction in real GDP in 2024, compared with projected growth of 0.9 per cent in the absence of conflict.[25]

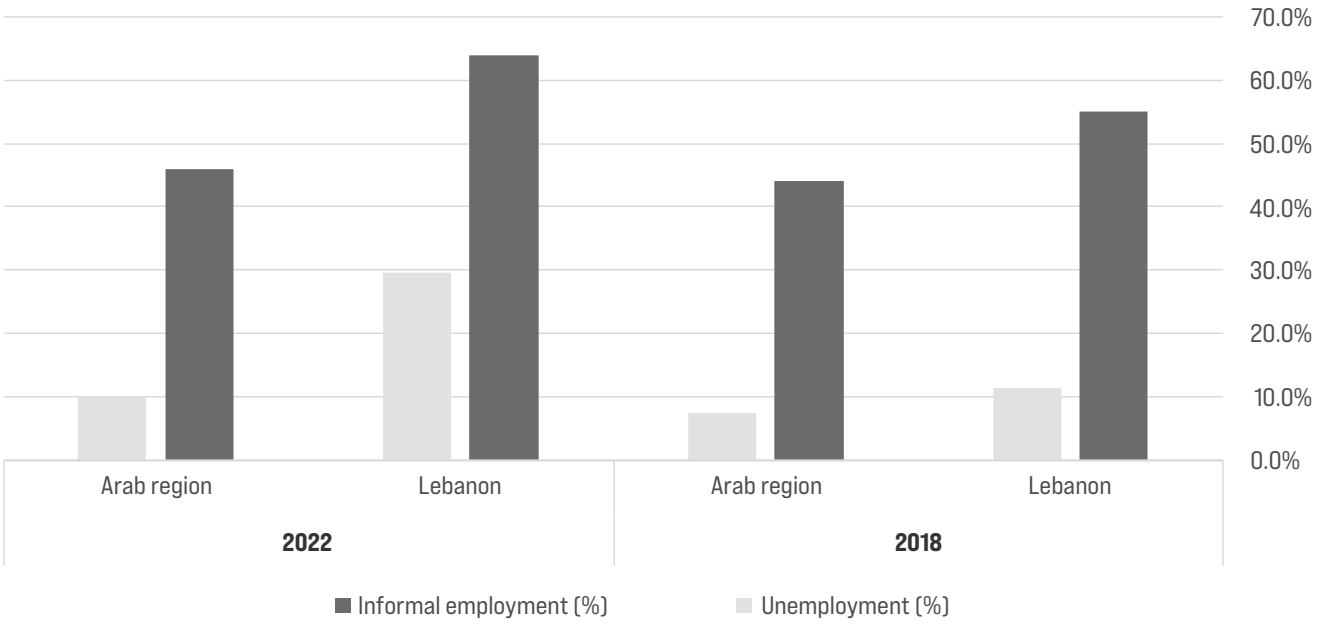
B. Demographic and labour market trends

In 2024, the country's population was estimated at around 5.8 million, with about 43 per cent under the age of 24 facing high unemployment and increasing youth emigration,[26] thereby shrinking the country's human-capital base. Over the past six years, population growth has fluctuated between 0.5 and 3.16 per cent at its highest, signalling declining fertility and outward migration, while the continued presence of Syrian refugees has added to pressures on labour markets, public services and social infrastructure.[27]

Informal employment dominates the country's labour structure. In 2018, it accounted for around 55 per cent of total employment, with men and women sharing similar proportions. By 2022, informality had risen to over 64 per cent, an increase of 9 percentage points. Compared with regional averages reported by ILO, the country's informality already exceeded the Arab regional average of 44.3 per cent.[28] By 2022, while the regional average rose slightly to 46.2 per cent, the Lebanese rate remained far above the Arab region's average (figure 3).

Before the crisis, labour-force participation stood at 48 per cent in 2019, with female participation around 29 per cent and male participation at about 70 per cent. Post-crisis, the total participation fell to 43.4 per cent in 2022 – a drop of 5 percentage points. Female participation decreased sharply to 22 per cent, while male participation

Figure 3. Lebanon versus the Arab region: informal employment and unemployment, 2018–2022



Source: CAS, Lebanon Labour Force Survey 2018–2019 and Labour Force and Household Living Conditions Survey 2022 (Beirut, 2023); International Labour Organization (ILO), ILOSTAT Statistics in Arab States.

remained roughly three times higher.[29] These figures show that women's already limited role in the labour market shrank further after the crisis.

By age group, 51 per cent of individuals aged 20–24 participated in the labour force in 2022, most of them men. The highest participation rate was among those aged 25–29, at around 65 per cent overall. Within this group, 88 per cent of men were in the labour force, compared with only 42.5 per cent of women. Compared with the Arab region, the Lebanese labour participation rate was about 1.2 percentage points below the regional average in 2018 and 6 points lower by 2022, indicating a widening gap.

In 2022, manufacturing (12 per cent), construction (8 per cent), wholesale and retail trade (18.8 per cent), and public administration and defence (12.2 per cent) together absorbed more than half of the Lebanese employed labour force. Compared with 2018, these shares show only minor changes: manufacturing and public employment increased slightly, while construction and trade declined.[30] The stability of these shares, despite severe economic contraction, reflects a labour market that has undergone relatively limited structural transformation, where employment remains concentrated in a few sectors offering limited productivity and resilience.

This limited evidence of structural transformation is mirrored in persistently high unemployment rates, which have worsened sharply since the crisis. In 2018–2019, the Lebanese unemployment rate was 11.4 per cent, roughly 4 points higher than the Arab regional average of 7.3 per cent.[31] By 2022, while unemployment across Arab countries averaged around 10 per cent (the highest among global regions), the Lebanese rate soared to 29.6 per cent, nearly three times higher.

Gender disparities are equally severe. In the period 2018–2019, female unemployment stood at 14.3 per cent, around 4 points higher than for men, close to the Arab regional average of 15 per cent. By 2022, however, women's unemployment in Lebanon exceeded 32 per cent, compared with about 18 per cent regionally, showing that women were disproportionately affected by the crisis.

Youth unemployment paints a starker picture. In 2019, rates reached 27.9 per cent (ages 15–19), 21.9 per cent (ages 20–24) and 14.7 per cent (ages 25–29), with young people aged 20–29 representing 40 per cent of total unemployment.

By 2022, these rates had more than doubled: 45 per cent of those aged 20–24, 37 per cent of those aged 25–29, and an alarming 55 per cent among those younger than 20 were unemployed. Within six years, the already fragile youth employment conditions worsened considerably, with young women most affected.

Educational attainment alone is no longer sufficient to ensure favourable labour market outcomes. In 2022, around 30 per cent of university graduates were unemployed, double the 15 per cent recorded before the economic crisis. This surge reflects the broader economic downturn and has contributed to rising emigration among skilled workers. Between 2018 and 2021, approximately 195,433 Lebanese emigrated, with the trend accelerating sharply after 2019 following a brief decline in 2020.[32] In 2021 alone, 77,777 Lebanese, representing around 40 per cent of total emigrants during this period, left the country, a rise largely attributed to continued economic challenges and the aforementioned port explosion. Compared with regional peers, the country's graduate unemployment rate was similar to that of Jordan at 27 per cent, but nearly double that of Egypt.

4

Understanding the Lebanese skills profile

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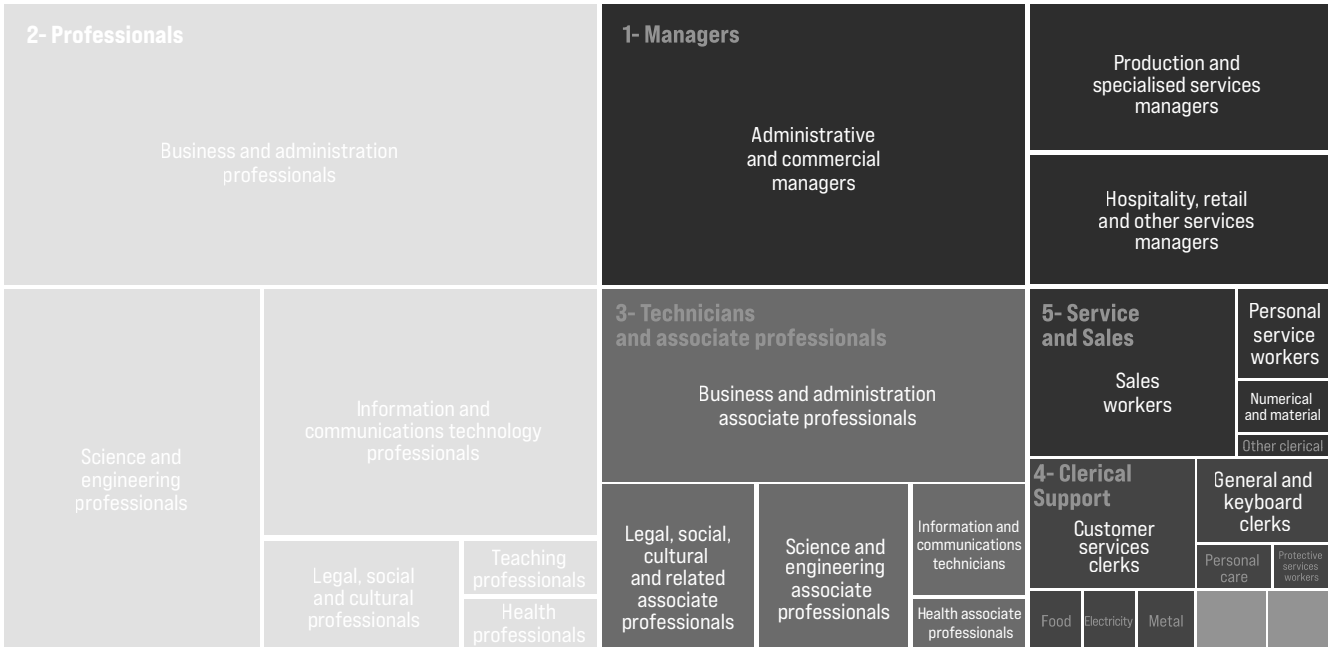
A. Most demanded occupations and skills in Lebanon

The ESM analysed 211,185 online job openings in Lebanon between March 2020 and August 2025, illustrating that the job market in Lebanon demands 8,964 unique skills, split into 351 human-related skills (soft skills) and 8,613 technical skills (hard skills). In term of occupations and skills demanded, we can observe that they mostly pertain to jobs involved with the Third Industrial Revolution, which is characterized by the utilization of computers and automation, and mostly requiring service-based profiles and talents. Since this analysis is based on online job postings, the results primarily reflect formal and white-collar demand, while blue-collar and informal occupations are likely underrepresented. The top 20 occupations consist mostly of traditional occupations such as accountants, sales representatives, administrative assistants, cashiers, chefs, marketing managers, project managers, human resource officers, waiters, restaurant managers, executive assistants, and customer service and call centre agents. Although most of the top jobs demanded in Lebanon describe a traditional or common trend of occupations, demanded jobs such as graphic designer, software developer and digital marketing manager indicate that more modern fields of work exist and comprise around 20 per cent of the top occupations demanded.

Looking at the ISCO job family classification of occupation provides a bird's-eye view of the distribution of occupations demanded in Lebanon. As illustrated in figure 4, it is largely dominated by the professional category, which typically requires higher levels of educational attainment. This trend reflects prevailing hiring expectations in the country, where employers increasingly seek candidates with advanced, specialized knowledge and expertise. The "Professionals" job family in Lebanon demands mostly business, science, technology, engineering and mathematics (STEM) and ICT-related occupations. This is followed by the "Managers" occupational category, which typically requires a combination of advanced expertise and substantial professional experience, further indicating strong demand for highly qualified candidates and elevated expectations within the Lebanese labour market. Following these two dominating job families are "Technicians" and "Associate professional", then service and sales workers and clerical support workers, which usually require a lesser level of education and specialization.

Skills demanded in Lebanon paint a similar and slightly more optimistic story, with a larger portion of top demanded skills pertaining to more advanced or digital fields. Figure 5 denotes

Figure 4. Distribution of occupations demanded by ISCO categories



Source: ESCWA Skills Monitor (August 2025 extraction).

the top 20 hard skills found in the Lebanese online job market in the last six years. Conventional skills commonly observed in the third industry, such as marketing, accounting, finance and project management, dominate demand in the Lebanese online job market, as expected, along with some skills pertaining to the Fourth Industrial Revolution. Typical third-industry skills such as auditing, invoicing, procurement and selling techniques are also found on the list.

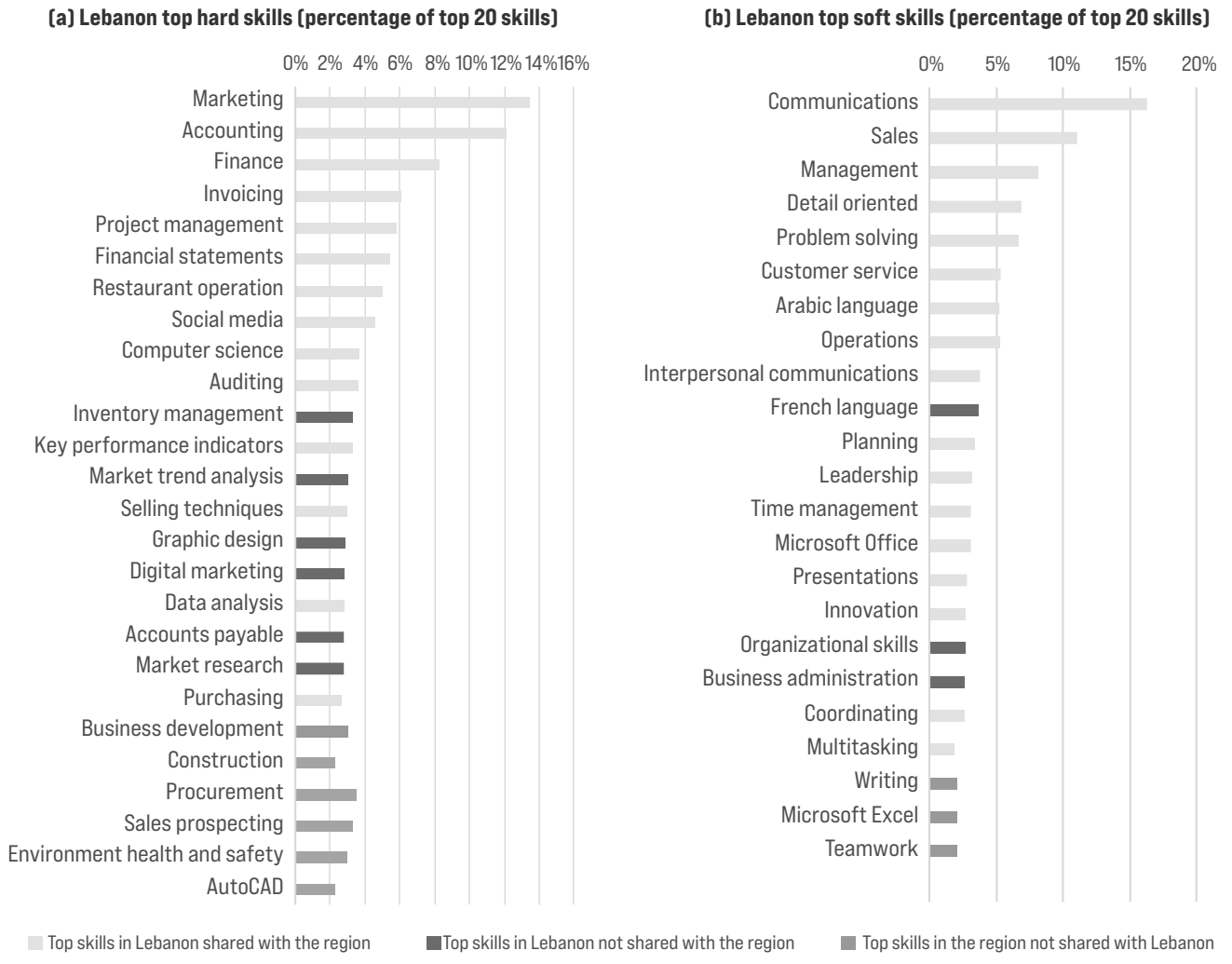
The online Lebanese job market shows signs of demand for skills related to the Fourth Industrial Revolution, namely computer science, social media management, graphic design, digital marketing, Adobe Photoshop and data analysis. Although remaining less prevalent than the conventional skills mentioned above, tech skills relevant to digitalization were observed in the top 20 hard skills demanded. Fourth industry skills constitute around 25 per cent of the top 20 hard skills demanded in Lebanon, compared with 15 per cent of top 20 hard skills in the United Arab Emirates and equal to 25 per cent of skills regionally. Although it is reasonable to assume that digital and Fourth Industrial Revolution occupations are more likely to be strongly present in online job vacancy advertisements compared with other skills, their share of top skills indicates that core sectors in Lebanon and the region relate more to conventional occupations.

In the context of developing economies like those in the Arab region, this alignment between the online market and the broader economy is expected, as both remain concentrated in traditional and less technology-intensive sectors.

The comparison of skills demanded in Lebanon with those in the Arab region reveals a high degree of homogeneity, with the former's top third-industry skills featuring prominently within the latter's top 20 demanded skills. The skills demanded in Lebanon are comparable with the ones demanded in the Arab region, indicating a similar dominance of the third industry. The data on demanded skills in both Lebanon and the region are obtained using the aggregation of vacancy data in the ESM until August 2025. Figure 5 reveals in detail the degree of overlap between Lebanon and the region in terms of skills demand. Some Fourth Industrial Revolution skills such as computer science and data analysis, which appear in the top 10 list of Lebanon, can be found in the top 20 demanded skills in the region.

Based on data from ESM, figure 5 shows the top 20 demanded soft skills in the country's virtual market, with communications, sales and management being the top three. According to Lightcast, Indeed and LinkedIn,[23] communication, management, leadership, creative thinking, flexibility,

Figure 5. Lebanon top hard and soft skills



Source: ESCWA Skill Monitor (August 2025 extraction).

self-learning and self-management, interpersonal skills and customer service are among the most demanded soft skills globally. Except for self-learning and self-management, flexibility and creative thinking, these skills highly overlap with the ones demanded by the Lebanese labour market. The lower prevalence of flexibility, creative thinking, self-learning and self-management among the top soft skills required may indicate that global markets have been faster in adopting remote or agile work cultures, as well as the uberization of business models. Other globally rising soft skills such as self-learning and self-management seem to be lagging in Lebanon and the region. Soft skills in Lebanon are highly homogenous with those of the region, with a recorded overlap of 17 common skills among the top 20 skills. This also suggests a high degree of alignment among the soft skills most valued in the region. To shed light on the dynamics of the skills demand in Lebanon over the past six years, we conducted several analyses to understand the relationship between skills and occupations and their degree of overlap.

B. Lebanon skills forest

The skills forest unveils the interconnection between jobs as a network, based on the hard skills they have in common. Behind every job posted is a set of skills demanded for the job. Looking at jobs and associated skills at large makes it possible to analyse the similarity of jobs based on common

skills demanded. Each node represents an occupation, with its size showing the frequency of postings for that occupation. The nodes are linked to the most similar occupation by means of shared skills.[34] For every pair of nodes connected in the forest, they have at least three hard skills shared with each other. The closer the distance the higher the number of shared skills. Lastly, to produce an interpretable visualization of the forest, ESCWA used a set of force-directed layout algorithms, together with some trimming, minimum-spanning and clustering techniques, which are usually seen in applied network theory. The Lebanon skills forest using skills observed until August 2025 is shown in figure 6.

The ESCWA skills forest for Lebanon illustrates the in-demand skills in the market, depicting the closeness among various occupations (normalized by ESCO occupations and depicted as nodes) based on the similarity of their required skills. The connections between these nodes, represented as branches, show the extent of skill similarity between different job pairs. The most densely packed section of the forest, known as the "core of the forest", indicates the highest level of interconnectivity among the most sought-after jobs in the virtual market through shared skills. This central area highlights that reskilling and upskilling for workers is relatively more straightforward than in the less connected outer regions of the forest. In the skills landscape for Lebanon, a singular core is observed. From figure 6, we can observe a mix of clusters by occupation types. Many Fourth Industrial Revolution occupations are observed on the periphery parts of the forest. The core of the forest for Lebanon is a mix of traditional occupations, demanding skills which are a mix of professional, technical and service-based.

Figure 6. Lebanon skill forest

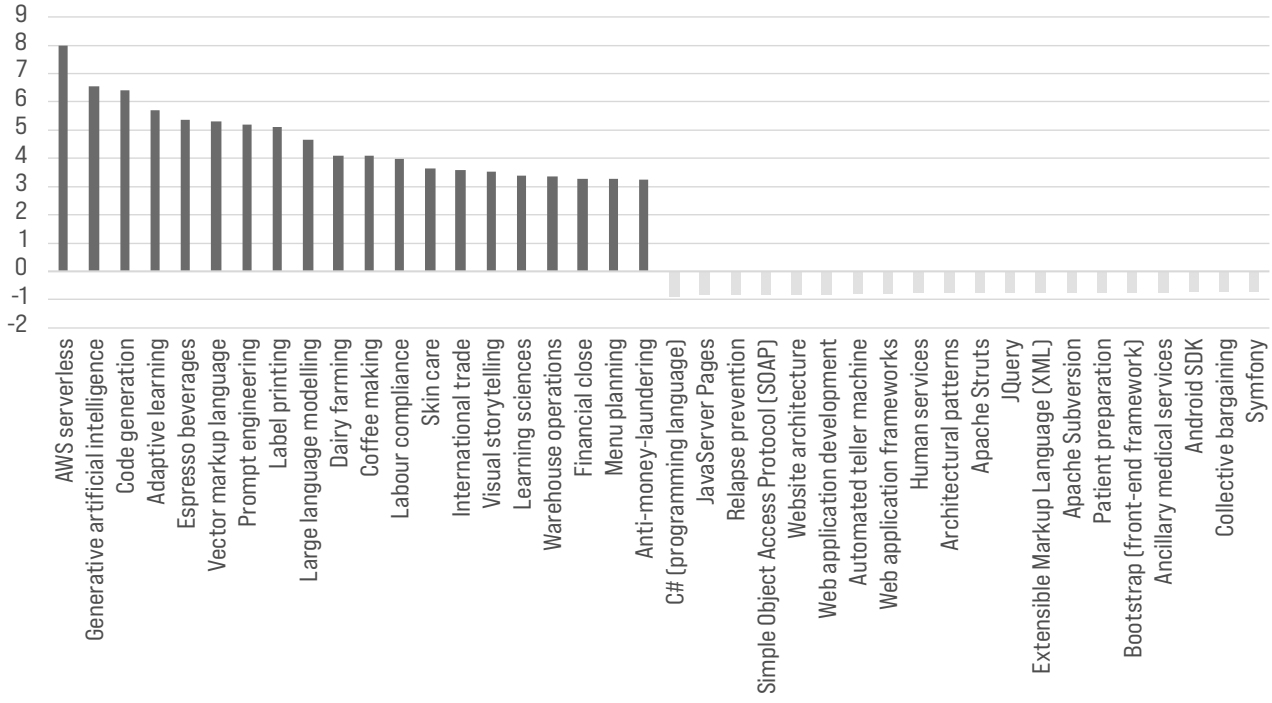
Source: ESCWA Skills Monitor (August 2025 extraction).

The skills forest shows how occupations in the Lebanese online job market can be clustered into three main groups based on the skills required. In figure 6, the upper region with the largest cluster describes occupations that are related to conventional business and service-oriented jobs, which typically share multiple skills involved with administration, finance, accounting and management, and other commercial type skills. This cluster is the largest and most densely interconnected, as the occupations it encompasses represent the greatest share of the Lebanese labour market and exhibit a high degree of overlapping skills. The second cluster, located on the left side of the skills map, primarily groups ICT-related occupations, including software and application developers, systems administrators, interface designers and other computer science-related roles. This cluster highlights the increasing presence of Fourth Industrial Revolution occupations, indicating that such roles represent a meaningful share of the Lebanese talent pool. Digital services-oriented jobs form the third cluster and are positioned at the bottom of the skills map in figure 6. The skills of these occupations involve and utilize the technologies of the Fourth Industrial Revolution along with other skills related to creativity, design and customer service. The three clusters observed describe a large group involved with conventional jobs and skills and two smaller yet emerging clusters, one involved with core Fourth Industrial Revolution and ICT occupations and skills, and another that demands both knowledge of digital tools as well as client servicing. The forest reveals that although the core of online labour demand in Lebanon remains centred on traditional occupations, two emerging clusters are gaining prominence: occupations driven by Fourth Industrial Revolution technologies, and occupations shaped by evolving digital and service-oriented skills. This finding requires further examination of demand for IT-related skills to better understand the dynamics of this emerging cluster and design the relevant policies in its direction.

C. Trends in skills profiles and the divergence of skills between 2020 and 2025

To understand the dynamics and evolution of skills demanded in Lebanon over the past six years, the present analysis examines emerging and declining skills from the perspective

Figure 7. Emerging and declining skills in Lebanon



Source: ESCWA Skills Monitor (August 2025 extraction).

of skills demand growth. We assessed over 9,000 skills from the third quarter of 2020 to the second quarter of 2025, and measured proportional changes between the first and second half of the period. Emerging skills are ranked by the highest positive growth, while declining skills reflect the largest negative growth.

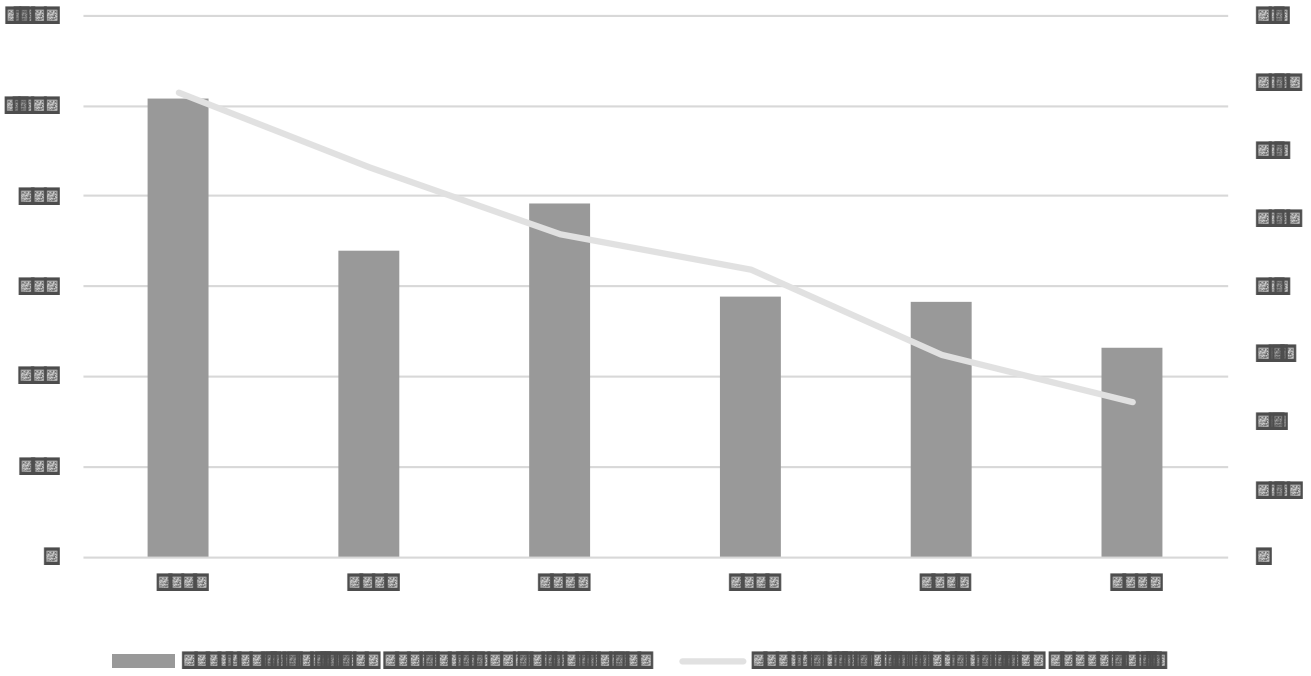
Figure 7 sets out the top emerging and declining skills and shows that many of the fastest-growing skills remain tech-related, particularly those linked to emerging technologies such as generative AI, prompt engineering and large language models. These results indicate that specific frontier technologies continue to gain traction in the Lebanese labour market, especially where firms seek to adopt or experiment with AI-enabled tools. At the same time, some traditional skills, including farming, coffee making and printing, also show strong proportional growth, reflecting the country's demand for conventional service and production sectors.

A closer look at broader skill categories reveals that certain niche or frontier tech skills continue to emerge, while the overall demand for IT and ICT skills has declined considerably in the Lebanese online job market. Figure 8 illustrates this clear downward trajectory where the average number of IT skills required per 1,000 job ads decreased by more than half between 2020 and 2025, and the IT share of all skills dropped from 36 per cent to approximately 11 per cent. This contraction may reflect the prolonged socioeconomic challenges Lebanon has recently experienced, which significantly impacted its ability to attract tech businesses and investments. This is also illustrated in the country's declining ranking in the Global Innovation Index, which dropped from eighty-seventh in 2020 to ninety-fourth in 2024.[35]

Moreover, to contextualize this decline, figure 9 compares trends across five major skill categories. While IT-related skills fell, other areas such as finance, business, marketing and public relations experienced steady and substantial increases, in some cases doubling over a six-year period. This divergence signals a reorientation of the Lebanese online job market away from ICT and Fourth Industrial Revolution capabilities towards more traditional service sector functions, such as customer engagement, business operations and financial services.

Such a shift carries important implications. Globally, ICT-intensive sectors are central to productivity growth,[36]

Figure 8. Evolution of demand in IT related skills in the Lebanese online job market, 2020-2025



Source: ESCWA Skills Monitor (August 2025 extraction).

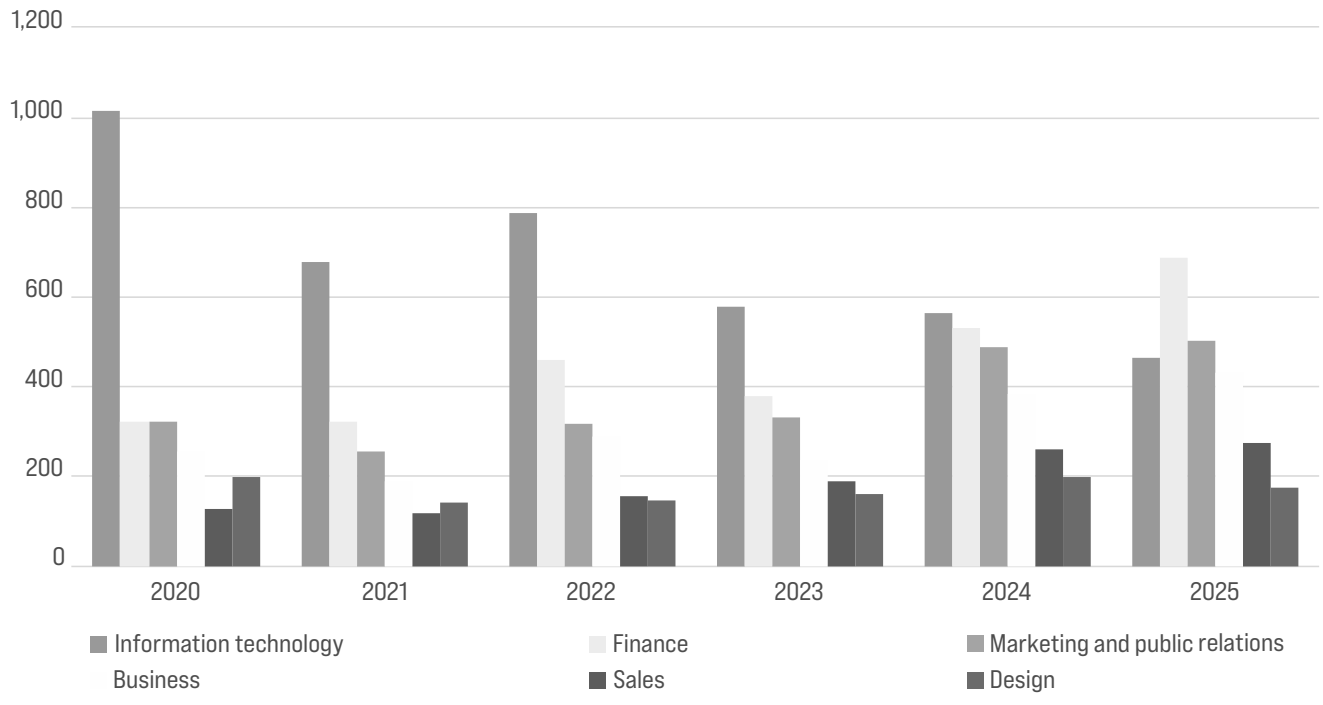
competitiveness and high-wage job creation. Declining demand for IT skills in Lebanon may therefore affect the country's ability to maintain or build a digitally enabled labour market. These trends may stem from macroeconomic instability, reduced private sector investment in technology, or persistent infrastructure constraints including electricity and Internet quality that limit the growth of digital industries. As a result, Lebanon may face increasing challenges in keeping pace with global digital transformation, while many other economies are accelerating their progress.

The impact of the Fourth Industrial Revolution and the introduction of new technologies do not stop at the ICT sector but are transforming the workplace and skills demanded in almost every industry. With the rapid growth of AI technology, which is already being demanded and integrated into the workplace, it is expected that AI will further automate or augment certain jobs and tasks in Lebanon and labour markets across the globe. In the present analysis, an AI augmentation scoring algorithm developed by Qatar Computing Research Institute was used to analyse the potential of AI augmentation in the occupations demanded in the Lebanese online market.

The concept of AI augmentation in occupations pertains to the ability of AI to boost human efficiency and output in different job roles. This means that instead of replacing humans, AI will complement human work in certain jobs, enabling a smaller workforce to achieve greater productivity. People who can use the new technologies will retain these occupations. The AI score algorithm employs a deep-learning methodology to assess the percentage of tasks that can be enhanced by current AI technologies. The algorithm assigns a score between 0 and 1 to measure this potential. It assesses each vacancy by examining the job description of each posting, breaking it down into individual tasks, and comparing those tasks with AI patents registered in the United States of America.

Figure 10 shows that occupations such as chefs, baristas and cashiers have low augmentation potential, averaging around 15 per cent, whereas roles such as accountants, business analysts, traders and computer-oriented professions fall on the higher end with augmentation potential close to 50 per cent. These patterns mirror global trends in which analytical and digital-intensive occupations are more easily augmented by AI technologies.

Figure 9. Trends of most demanded skill categories, 2020-2025



Source: ESCWA Skills Monitor (August 2025 extraction).

The average augmentation score of Lebanon is 0.32, slightly above the regional average of 0.30, suggesting that the composition of tasks demanded in Lebanon is modestly more compatible with AI than in neighbouring countries. The right tail of the distribution also extends further in Lebanon, indicating that some occupations have relatively high potential for AI-enabled productivity gains.

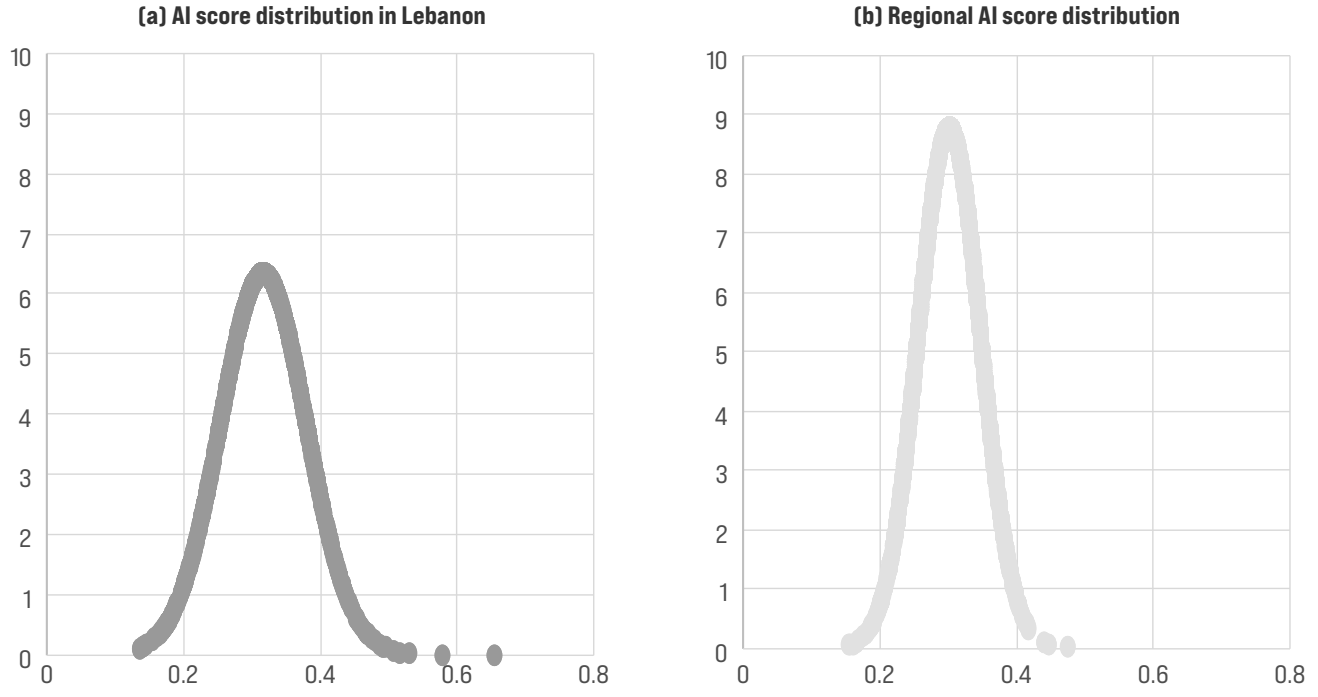
However, these opportunities exist alongside a broader decline in ICT and digital skills demand in the country. While certain roles show strong augmentation potential, the moderation in ICT sector activity and reduced investment in technology may constrain the pace of AI adoption at scale. Persistent infrastructure challenges, including unreliable electricity and Internet quality, further constrain AI integration in business operations.

Overall, skill demand in Lebanon reveals an evolving pattern: the emergence of certain high-tech and AI-related skills coexists with a broader decline in ICT capabilities and a shift towards traditional service sector roles. This divergence underscores structural constraints in the Lebanese online labour market and signals the need for targeted policies and investment to rebuild ICT capacity, enhance digital infrastructure, and support a more resilient and technologically enabled workforce.

The ESM also provides some insight related to gender preference, seniority preference and work modality. These metrics are essential to understanding how inclusive the Lebanese labour market is in terms of young people, women and seniority biases. Almost 28 per cent of the Lebanese labour market seem to demand female employees while 3 per cent of job advertisements request male employees, and the rest (69 per cent) do not specify. Although these aggregate figures may initially suggest a lower prevalence of economy-wide gender bias, a closer look at the gender-specified postings reveals clear occupational segmentation in employer demand.

Among the postings that explicitly specify a gender preference, the overwhelming majority indicate a preference for female candidates (figure 11). Across the top 20 occupations with sufficient observations, more than 85 per cent of gender-specified advertisements request female candidates. This pattern is especially visible in clerical

Figure 10. AI score distribution in Lebanon and the Arab region

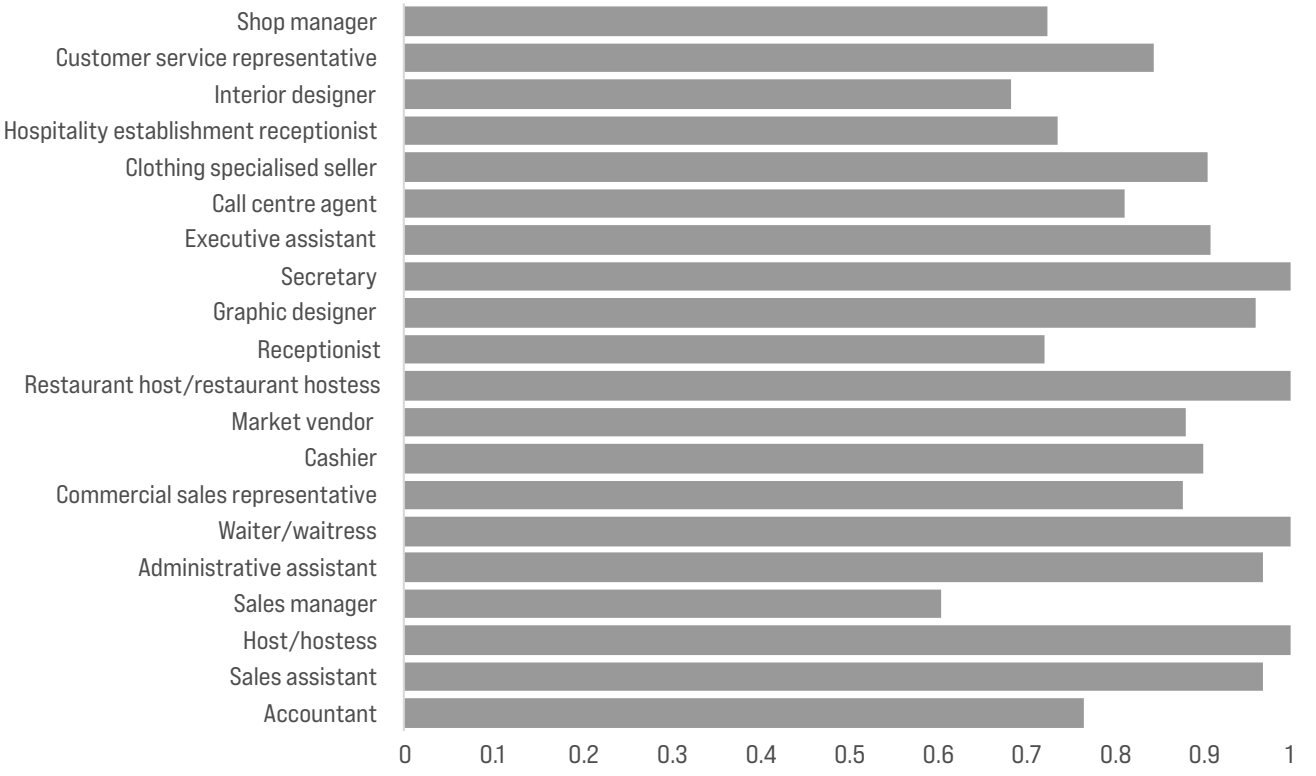


Source: ESCWA Skills Monitor and Qatar Computing Research Institute.

and customer-facing occupations, such as administrative assistants, sales assistants, cashiers, hostesses and receptionists. Conversely, few occupations exhibit male-specific demand, and even roles traditionally considered male-dominated, such as warehouse positions or technical occupations, display low male preference when gender is explicitly mentioned. These results show that employer gender preferences in the Lebanese online job market remain largely concentrated in specific occupations, reinforcing occupational segmentation rather than broad gender equality. Such segmentation limits the size of the potential talent pool for certain roles by effectively restricting opportunities to one gender.

In terms of work modality, only 2.5 per cent of job ads specify remote or hybrid work modality, while the rest require office presence. In comparison to similarly structured economies such as Jordan and Tunisia, which recorded 4.3 and 3.1 per cent of job ads specifying remote or hybrid work, respectively, the adoption of deliverable-based remote work in Lebanon appears somewhat lower than in comparable countries. In terms of seniority, the ESM records a demand of 59 per cent for entry level jobs in Lebanon, while junior to mid-level positions occupy 35 per cent and senior positions a meagre 6 per cent. With youth unemployment being a major hurdle in Lebanon and the region, these figures indicate an ability for the market to absorb young people into the labour market, provided they meet the skill level requirements.

Figure 11. Gender-specified job demand in Lebanon (Top 20 occupations)



Source: ESCWA Skills Monitor (August 2025 extraction).

Conclusion

Big-data tools, particularly online job postings and skill taxonomies, offer timely granular insights into labour-market dynamics, especially in data-constrained environments such as Lebanon. Despite significant gaps in traditional labour statistics, these sources allowed us to identify shifts in skills demand, changes in employment composition and sectoral vulnerabilities with far greater precision. Leveraging such tools strengthens evidence-based policymaking and helps anticipate structural changes earlier and more accurately.

Examining Lebanese labour-market dynamics provides important insights into the challenges facing the country's economy and workforce. Macroeconomic indicators reveal a series of interlinked crises that have significantly affected the country's growth and employment prospects. Unemployment rates peaked at nearly 30 per cent in 2020, around three times higher than the Arab regional average, with particularly alarming levels among young people. This was accompanied by a sharp rise in informal employment, which expanded by 9 percentage points from pre-crisis levels to reach 64 per cent by 2022, reflecting a shift towards unregulated jobs as the economy contracted. Over the same period, the labour force declined by about 5 per cent, while female participation remained well below regional averages. As a result, the labour market capacity has been reduced, undermining prospects for recovery and sustainable growth. By 2022, most jobs remained concentrated in traditional sectors, such as construction, basic manufacturing and public administration, with limited transition towards more technology-driven activities. This reality has contributed to a prolonged period of low growth that threatens long-term recovery and stability.

Against this backdrop, the changing dynamics of skills demand reveal the labour market's potential in making a rebound. The Lebanese online job market appears to be catching up with Fourth Industrial Revolution trends, as the share of tech-related skills in job postings is catching up to the regional average. Although the core of Lebanese online labour demand remains concentrated in traditional occupations, conventional business and service roles, such as accounting, finance, hospitality and sales, the labour market is still experiencing growth in tech skills. Slightly less than half of the emerging skills measured by relative growth in demand pertain to digital and ICT skills, while around 55 per cent remain dominated by service-oriented fields, mirroring the continued dominance of these sectors in the Lebanese economy.

Conversely, decaying skills (those showing the sharpest decline) are taken over by tech skills, which indicates that they peaked in the first half of the five-year period and then dropped in the second half for various reasons. As mentioned earlier, tech skills experience sharper fluctuations in demand as they reflect the speed through which different technologies are growing and shifting to replace others or compete with them. These high-value demanded tech skills are deemed to produce a more efficient and productive workforce that must be supported and leveraged through training and continuous learning. The country's vibrant digital and tech skills in demand can play a central role in elevating the private sector's ability to rebound, grow and retain more business regionally and globally, especially as Lebanon became a more cost-effective option with the deterioration of the currency peg between 2020 and 2023, making the country relatively more competitive. This comparative advantage became clearer when looking at the country's AI score in comparison with the region, which signals that it can operate at a slightly higher efficiency and productivity than others if this demand was met with the appropriate supply.

The ability of Lebanon to adapt to various socioeconomic shocks and a rapidly changing economy over the past six years has come at a high cost, reflected in a sharp decline in economic growth and soaring unemployment and inflation. The adaptability of its labour market has come under pressure with higher levels of emigration, continued outflow of skilled talent and business closures. The market, however, through its skilled labour and regional and global positioning, may still be resilient enough to rebound. Leveraging this resilience through appropriate policies and initiatives is key to the country's economic recovery.

Policy recommendations

Building on the findings of the present paper, which highlight the growing demand for ICT and Fourth Industrial Revolution skills, supported by international evidence demonstrating their central role in driving productivity, policy action must be carefully sequenced and grounded in economic reality. Given the multifaceted socioeconomic turbulence Lebanon has experienced over the past six years, achieving foundational economic stabilization is an important prerequisite for any successful labour market intervention. Without it, job creation is likely to remain subdued, investment virtually absent, and the outflow of skilled talent may continue. Lebanon should prioritize the implementation of a credible reform agenda encompassing fiscal and monetary stabilization, public debt restructuring, infrastructure development and governance reforms, to strengthen confidence and support economic recovery. Alongside these reforms, prioritizing public and private investment in critical infrastructure, particularly reliable electricity and high-speed Internet, is essential. Such investment is directly linked to creating an enabling environment in which technology and Fourth Industrial Revolution sectors can operate and grow sustainably. Establishing a comprehensive national ICT and digital sector strategy is therefore important to capitalize on the emerging demand for digital and Fourth Industrial Revolution skills identified in the present paper, and to translate this potential into sustained productivity gains and long-term economic growth.

In addition to these essential national-level reforms, targeted efforts should be undertaken to better support and develop talent within the labour market, as well as within the firms that employ it. This is critical, as both serve as primary drivers of economic growth. Our analysis shows a vibrant but rapidly changing demand for tech skills, with new skills like generative AI emerging while demand for others rapidly declines. Although ESM data provide relative trends, the volume of such demand should be measured accurately through surveys, and policymakers should partner with the private sector, including academic and training institutions, to develop targeted short-term skilling, reskilling and upskilling programmes focused on high-demand digital and Fourth Industrial Revolution skills identified by ESM. This should be coordinated under a national skills council that aligns training programmes with real-time market needs, like SkillsFuture Singapore, which provides citizens with credits for modular industry-vetted courses to ensure lifelong learning.

With an average AI augmentation potential of 32 per cent, the Lebanese job market is set to be complemented, not replaced, by artificial intelligence. It is important to equip the workforce with the skills needed to use these new AI tools effectively. Education policy should mandate the integration of AI literacy, data analytics and practical tool usage (such as prompt engineering) across all levels of education, with a particular focus on professions with high augmentation potential like accounting and data analysis. This mirrors the Finnish Elements of AI initiative, which successfully raised AI awareness and competency across its entire population. Embedding these skills into both formal education and lifelong learning pathways would ensure that the Lebanese workforce remains adaptable to technological change.

The Lebanese market currently shows scope for further development in globally critical soft skills such as flexibility, creative thinking and self-learning, as well as in the adoption of remote work (only 2.5 per cent of online job ads). Policymakers should promote regulatory frameworks that enable remote and hybrid work models, while simultaneously working with educators to embed human-centric skills, which are less susceptible to automation, into all training programmes. This approach reflects a global trend seen in countries like Estonia, which has built a digital-first economy and actively promotes a flexible and agile work culture through e-governance. Moreover, expanding remote and flexible work arrangements can help individuals who are more productive when working remotely, while also creating opportunities to take on jobs with international employers, making Lebanon a more attractive hub for global and diaspora talent.

To help retain skilled talent and leverage this advantage, the Government should actively support the creation of tech hubs and tech business incubators. This strategy follows the successful Startup India initiative, which utilizes tax incentives, simplified regulations, suitable infrastructure and dedicated innovation zones to nurture a thriving tech ecosystem and retain high-skilled talent. These hubs could also serve as spaces for collaboration between local firms, universities and remote international companies, thereby anchoring talent within the country. Lastly, sustained progress in skills development and labour-market alignment requires institutionalized data systems and continuous feedback between policymakers, education providers and employers. Lebanon should therefore build a national skills intelligence platform, integrating university graduate data, online job vacancies and training programme outcomes, building on ESM. This platform should also track mid-career upskilling and reskilling initiatives to ensure workers can adapt to evolving labour-market needs. A public skills dashboard could make this information accessible to students, educators and policymakers alike, mirroring the CEDEFOP Skills Intelligence Platform of the European Union. Such an initiative would not only improve policy targeting but also enhance transparency, coordination and accountability in the labour-market reform process.

Lebanon stands at an important juncture where macroeconomic stabilization and human capital renewal must go hand in hand. Restoring fiscal and monetary credibility, rebuilding infrastructure and investing in digital connectivity are not isolated goals; they form the foundation for a resilient labour market and a modern, inclusive economy. Without this stability, labour market interventions are likely to have more limited impact.

At the same time, the educated and globally competitive Lebanese workforce is one of its strongest assets. By fostering continuous learning, promoting flexible and remote work and building robust skills intelligence systems, the country can position itself as a regional hub for digital talent and innovation. Coordinated public-private partnerships, anchored in credible reforms and data-driven policymaking, can transform current challenges into an opportunity for sustainable knowledge-based growth.

Endnotes

1. International Labour Organization (ILO), The feasibility of using big data in anticipating and matching skills needs, 2020.
2. World Economic Forum (WEF), The Future of Jobs Report, 2025.
3. WEF, The Future of Jobs Report, 2023.
4. World Development Report, The Changing Nature of Work, 2019.
5. Using data from 43 million online job postings to assess digital skills demand.
6. OECD, Skills for the Digital Transition, 2022.
7. ILO, Lebanon Follow-up Labour Force Survey January 2022, 2022.
8. ILO, The feasibility of using big data in anticipating and matching skills needs, 2020.
9. Ibid, figure 1.8.
10. Ibid.
11. Ibid.
12. The 20 countries are Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, the State of Palestine, Qatar, Saudi Arabia, Somalia, the Sudan, the Syrian Arab Republic, Tunisia, the United Arab Emirates and Yemen.
13. Data extracted in August 2025.
14. Cleaned for duplicates and special characters.
15. This is necessary because similar jobs may be advertised under different names. For instance, without grouping data analysts and time series analysts into the same category, the data cannot effectively identify their similarity.
16. ISCO-08 normalizes occupations into a four-level hierarchy. ESCO uses the same four-level hierarchy as ISCO-08 and further defines fifth-level normalized titles within the ISCO taxonomy.
17. For this, ESCWA uses a set of slightly different NLP algorithms to tackle the mapping problem, with the technical focus switched to the name entity recognition (NER) methodology. Technical details are also omitted here.
18. World Bank, World Development Indicators (GDP, constant 2015 US$), accessed October 2025, https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.
19. Calculations based on World Bank, World Development Indicators (GDP, constant 2015 US$).
20. Calculations based on World Bank data.
21. World Bank, Lebanon: Normalization of Crisis is No Road to Stabilization, 2023.
22. International Monetary Fund (IMF), General government gross debt (% of GDP) – Lebanon (accessed October 2025).
23. World Bank, Lebanon: Poverty more than triples over the last decade reaching 44% under a protracted crisis, 2024.
24. BDL, Macroeconomic Review, June 2025, Issue No. 1, Beirut.
25. World Bank, Lebanon: Rapid Damage and Needs Assessment (RDNA), March 2025.
26. World Bank, World Development Indicators (Population and demographic structure) (accessed October 2025).
27. Central Administration of Statistics (CAS), Labour Force Survey 2018–2019 and Labour Force and Household Living Conditions Survey 2022 (Beirut, 2023).
28. ILOSTAT, Statistics in Arab States (accessed October 2025).
29. CAS, Labour Force Survey 2018–2019 and Labour Force and Household Living Conditions Survey 2022 (Beirut, 2023).

30. Ibid.

31. ILOSTAT, Statistics in Arab States (accessed October 2025).

32. Miguel Mendelek, The Lebanese Trend of Emigration: A New Peak Since 2019?, 2022.

33. Indeed data are published in HR News, The top 20 hard and soft skills jobseekers should showcase to get an interview, 2023; Lightcast data are published in WEF, The Future of Jobs Report, 2025; and LinkedIn data are published in Mercer, 2024 Global Talent Trends, 2024.

34. To calculate the weights of linkages between each node, each node was first treated as a point in a N-dimensional Euclidean space, where the dimension of the space is determined by skills observed. Then a slightly revised version of Jaccard metric was used to calculate the skill-based distance between each node.

35. WIPO, Lebanon Ranking in the Global Innovation Index 2025.

36. OECD, Measuring the Digital Transformation, 2019.

The present paper analyses the Lebanese labour market and evolving skills demand after six years of compounded economic, social and geopolitical crises, using big data from online job advertisements processed through the ESCWA Skills Monitor. In the context of severe economic contraction, rising unemployment, informality and accelerated outflow of skilled talent, the paper provides a data-driven assessment of how skill requirements have shifted between 2020 and 2025.

The analysis reveals a labour market still dominated by traditional service and business occupations, alongside the emergence of selected digital, information and communication technology (ICT), and artificial intelligence-related skills linked to Fourth Industrial Revolution technologies. However, it also identifies a structural decline in overall ICT skill demand and digital-sector momentum, reflecting the country's constrained investment climate and infrastructure limitations. By combining macroeconomic context with granular skills intelligence, the present paper demonstrates how big data can compensate for constrained statistical systems and support evidence-based policymaking. It concludes that recovery in Lebanon depends on aligning macroeconomic stabilization with human-capital development, targeted digital skills investment and institutionalized skills intelligence systems to rebuild a resilient, inclusive and future-ready labour market.

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