July 2021

Advanced Technologies for Industry – Report

Using LinkedIn data to shed light on industrial ecosystems, skills and inter-sectoral mobility during the Covid-19 period

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Section 1

1. Introduction

This report has been developed in the framework of the Advanced Technologies for Industry (ATI) project, initiated by the European Commission's Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW), and the European Innovation Council and Small and Medium-sized Enterprises Executive Agency (EISMEA).

This particular report aims at harnessing the LinkedIn data source to reflect about the employment of professionals with specific skillsets such as advanced technologies, green or digital skills within twelve industries belonging to the industrial ecosystem framework of the European Commission, where data were available. The first Annual Single Market Report[1] identified fourteen industrial ecosystems important for the European economy and recovery. Out of these fourteen the following industries are covered in this analysis: Agri-food, Aerospace, Automotive, Chemicals, Construction, Creative and cultural industries, Healthcare, Electronics, Renewable Energy, Retail, Textiles, Tourism.

The report includes an analysis of professionals employed in the industries in focus based on data from the self-reported skills of professionals in LinkedIn, a widely used and accepted online job platform. LinkedIn provides a unique opportunity to enrich our understanding of the supply of skills with a level of granularity that is not available in any of the traditional data sources. The number of advanced technology skilled professionals employed across different industries and economic sectors can also give some indication about the level of technology uptake in industry. To harvest the data from LinkedIn, keywords capturing skills by advanced technology have been defined. Queries have subsequently been constructed to filter the database by location and industry. It has to be noted that the results have to put into a broader context. Industrial and skills trends can be well understood only through a multidisciplinary approach informed by both quantitative and qualitative methods.

[1] European Commission (2021). SWD/2021/351 final

Section 2

2. Methodology

This section reiterates the findings of the ATI methodological report[2] that explored extensively the representativeness, the use and limitations of the LinkedIn datasource for analysis of technology-skilled professionals[3].

2.1 Harnessing LinkedIn data to capture professionals with advanced technology skills

LinkedIn is the largest professional network platform with rich information like profile summary, job title, job description and field of study, which can be used for the identification of skilled professionals in advanced technologies. **It represents the single most comprehensive source currently available for analysing specific sectors and industries with insights for technology-specific skills and trends**.

Compared to highly resource intensive alternatives such as surveys LinkedIn represents the most cost effective alternative considering not just the cost of running the analysis once but also the potential to run the analysis at regular intervals and on demand (e.g. during and after the Covid-19 crisis). The use of LinkedIn gives practitioners the flexibility not only to define any combination of skills but to do so at the national, regional or even local level. Nevertheless, LinkedIn has also its limitations that needs to be accounted for before drawing conclusions based on the data.

LinkedIn is a voluntary professional networking platform. This implies that registered users have chosen to sign up, leading to self-selection into the sample. Hence, the LinkedIn sample is not a random sample. Secondly, the self-selection of LinkedIn users implies that they chose to join based on rational arguments, and only those who find utility in joining will do so. This is likely to create bias as not everyone has the same utility of joining LinkedIn depending on various factors such as geographical location, sector of activity and plausibly level of education. This is supported by the data, as one can easily observe differences in popularity of LinkedIn between countries and sectors. Hence, self-selection of LinkedIn users justifies the expected lack of representativeness of the active population.

Using the LinkedIn tool to harvest data is very powerful and provides practitioners the flexibility to monitor skills supply in a way that has not been possible using traditional data sources. It is based on the algorithm developed by LinkedIn. Access to the raw data for an extended verification of the results is not possible but it is possible to manually check the profiles returned by queries to assure the good performance of the queries. It should also be noted that for instance when looking for the share of population with specific skills, it is not possible to assess the level of the skill, nor to distinguish between academic knowledge and industry knowledge. However, skills supply in a specific industry is possible to isolate by selecting a sector which results in only professionals currently employed in the sector in focus to be returned by the query. Furthermore, the database is constructed based on the information provided by the users on their profiles. Users basically have the opportunity to claim what they want, although it would be unlikely that someone would claim a skill not at all relevant for the employment profile he/she is working in. Data is therefore dependent on users' honesty, self-assessment (what skills do I consider having?), willingness to share information and involvement in the network (how exhaustive is my profile?). This characteristic may leave room for non-accuracy of information but that would have been the same in the case of surveys.

When trying to assess the representativeness of certain industries, it is difficult to link the LinkedIn database to data retrieved from Eurostat since there there are important mismatches between the definition used in each source.

Approach to test the representativeness of LinkedIn

To perform the test of representativeness of LinkedIn we proceeded in two stages. First, the two datasets notably LinkedIn and Eurostat (active population) have been compared based on key statistics. These descriptive statistics show if the two populations behave similarly regarding different key aspects: entire workforce, educational attainment, gender and the science sector. Similar behaviors and figures

[2] https://ati.ec.europa.eu/reports/eu-reports/advanced-technologies-industry-methodological-report

[3] Herewith, this author thanks for the support of Paresa Markianidou and Hannah Bernard (Technopolis Group) whose work should be acknowledged.

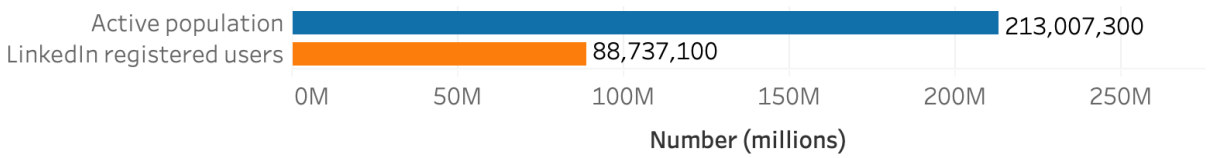
tend to indicate that the sample represents well the population. Second, the representativeness of LinkedIn has been statistically tested on the same aspects through X-squared tests. These tests allow to check whether the difference in the behavior of the two populations is statistically significant or not, and therefore whether the sample fail to represent the population, or not.

Descriptive statistics comparing Eurostat data and LinkedIn aggregates

Workforce

The comparison of the EU27 workforce and the number of EU27 LinkedIn users in terms of absolute numbers shows that the active population of the EU27 is 213 million while 88.7 million Europeans are registered on LinkedIn. In other words, 41.6% of the active population is registered on the professional networking platform.

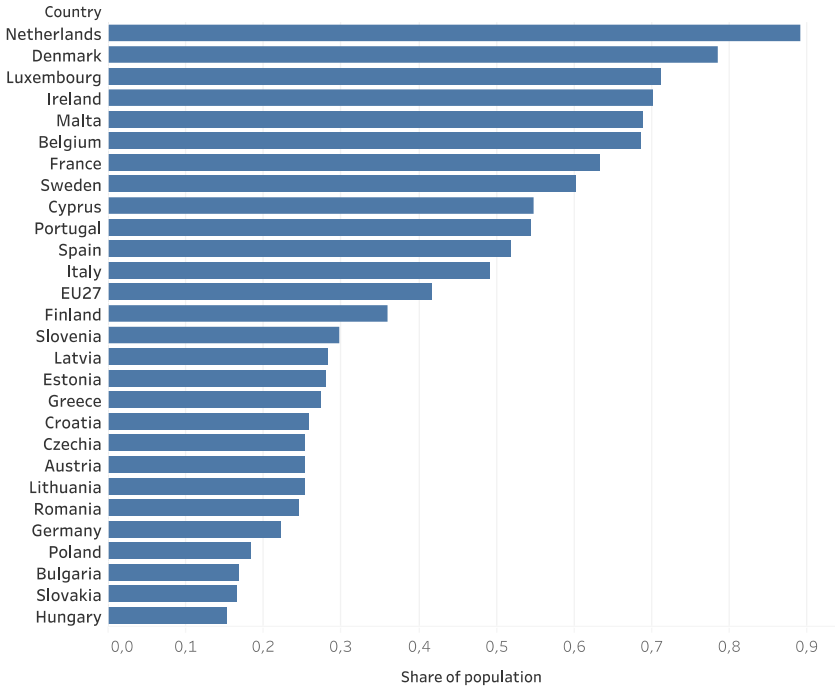
Figure 1: EU27 active population vs EU27 LinkedIn registered users



Source: LinkedIn and Eurostat (Active population by sex, age and educational attainment [lfsa_agaed] - All ISCED 2011 levels; 15 to 74 years old; 2018)

Behind the aggregated figure at the EU27 level, there is an important heterogeneity in the national use of LinkedIn among EU Member States, as indicated by the next figure. Indeed, in some EU countries, the number of LinkedIn users is marginal, while it is widely spread in others. In particular, Hungary, Slovakia, Bulgaria and Poland display the lowest use of LinkedIn, with less than 20% of the population registered on the platform. On the other hand, Netherlands and Denmark are the countries where LinkedIn is the most popular, with more than 75% of the active population registered (see Figure below).

Figure 2: Share of active population registered on LinkedIn by country

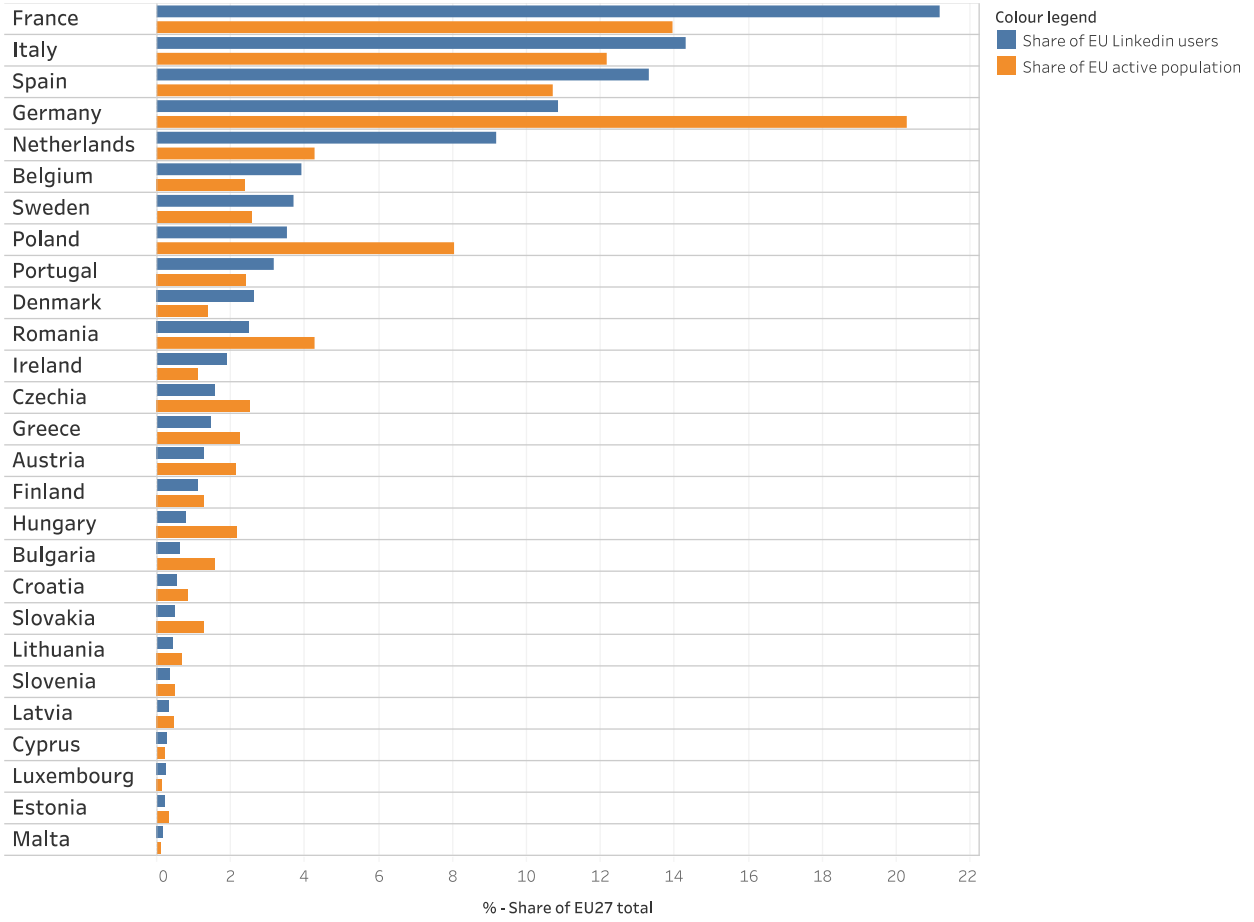


Source: LinkedIn and Eurostat (Active population by sex, age and educational attainment [lfsa_agaed] - All ISCED 2011 levels; 15 to 74 years old; 2018)

As a result of the heterogeneity in the use of LinkedIn between EU Member States, the LinkedIn population does not reflect the EU population. Indeed, the countries where the use of LinkedIn is rare are underrepresented on the platform, while the countries where the use of LinkedIn is widespread are overrepresented. Figure 3 compares the share of the EU workforce and of the EU LinkedIn population

of each country, and highlights the mismatch between them. For example, while the active population of Poland and Romania accounts for 8.03% and 4.25% of the total EU active population respectively, they only represent 3.53% and 2.5% of the EU LinkedIn users. On the contrary, Netherlands and Denmark represent 9.16% and 2.64% of the LinkedIn users although they only account for 4.28% and 1.4% of the EU active population. In total, 15 countries are underrepresented on LinkedIn (e.g. Germany) and 12 are overrepresented (e.g. France).

Figure 3: Share of total EU 27 active population vs share of total EU LinkedIn users by country



Source: LinkedIn and Eurostat (Active population by sex, age and educational attainment [lfsa_agaed] - All ISCED 2011 levels; 15 to 74 years old; 2018)

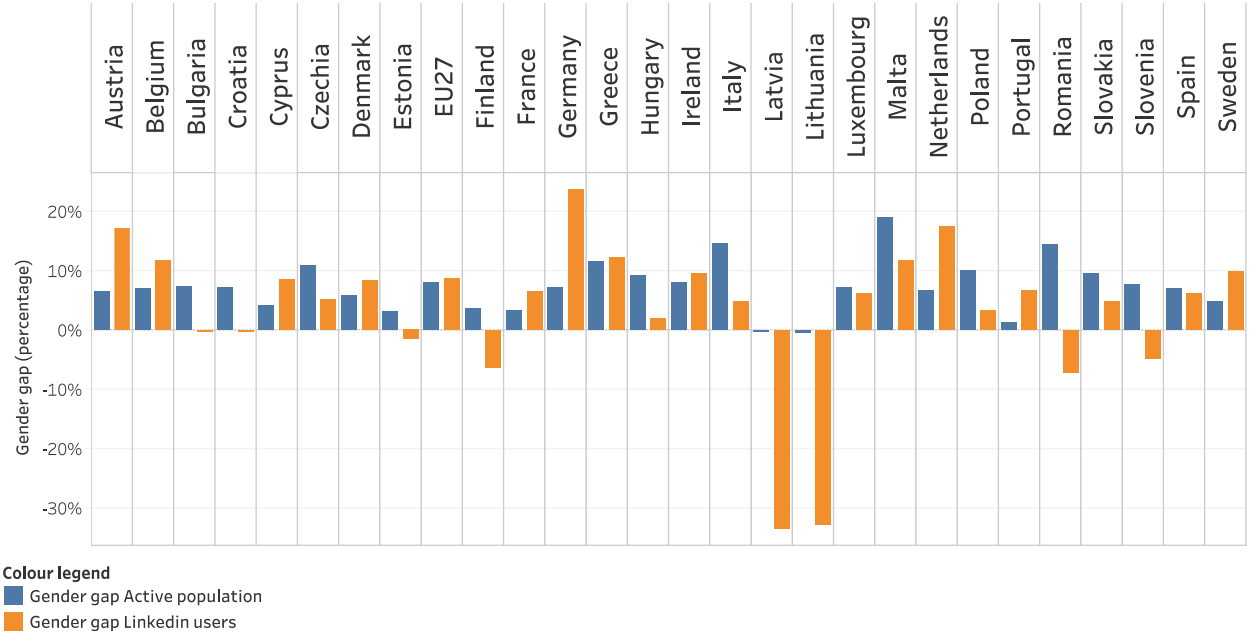
Gender

In order to assess the representativeness of the LinkedIn population in terms of gender proportions, we use the gender gap.[4] Figure 4 illustrates the gender gap that takes place in the active population and among the LinkedIn registered users. At the EU level, the gender gap on LinkedIn is comparable to the gender gap in the active population, with respective values of 8.62% and 7.95%. Regarding gender proportions, the LinkedIn population is therefore representative of the active population at the European level. However, among EU Member States, heterogeneity is observed.

Some countries display higher gender gaps on LinkedIn than in the active population. In particular, Austria, Germany and Netherlands display the most important gender gap on LinkedIn despite a limited gender gap in the active population. On the contrary, there are countries where the gender gap is reduced on LinkedIn compared to the active population, or even of opposite sign. Indeed, Estonia, Finland, Slovenia and Romania have a negative gender gap on LinkedIn (more women than men) but a positive one in the active population. This indicates a high propensity of women to register on LinkedIn. The same trend occurs in Lithuania and Latvia where the gender gap is negative both among the LinkedIn users and the active population, but is more pronounced on LinkedIn.

[4] The gender gap is calculated as the difference between the percentage of the labour market constituted of men and the percentage of the labour market constituted of women. The classification in function of the gender gap is therefore the same as the presence of women on the labour market.

Figure 4: Gender gap in active population vs LinkedIn users

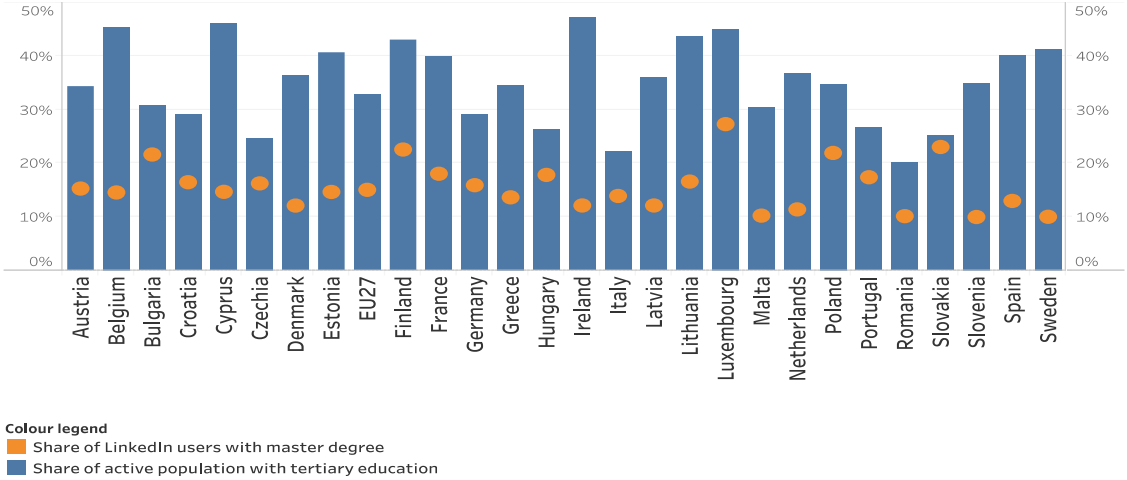


Source: LinkedIn and Eurostat (Active population by sex, age and educational attainment [lfsa_agaed] - All ISCED 2011 levels; Females and Males; 15 to 74 years old; 2018)

Educational attainment

Regarding the educational attainment, we first analysed the highest educated share of population both in LinkedIn and in Eurostat data. When comparing the share of LinkedIn users with master's degree and the share of active population with tertiary education, one can observe that the share of population with tertiary education is smaller for the LinkedIn users than for the active population in all countries. The first straightforward explanation is the underrepresentation of the population with a master's degree among LinkedIn users. However, more plausibly, the low shares of tertiary educated workers on LinkedIn might as well be explained by the non-systematic registration of educational attainment on LinkedIn. Since the information on the educational attainment is missing for 68.7% of the LinkedIn sample, the share of those who are registered as having a master on the total users is low. Additionally, only the LinkedIn users having a master's degree are accounted for in the LinkedIn ratio, while tertiary education includes other forms of higher education in the active population ratio.

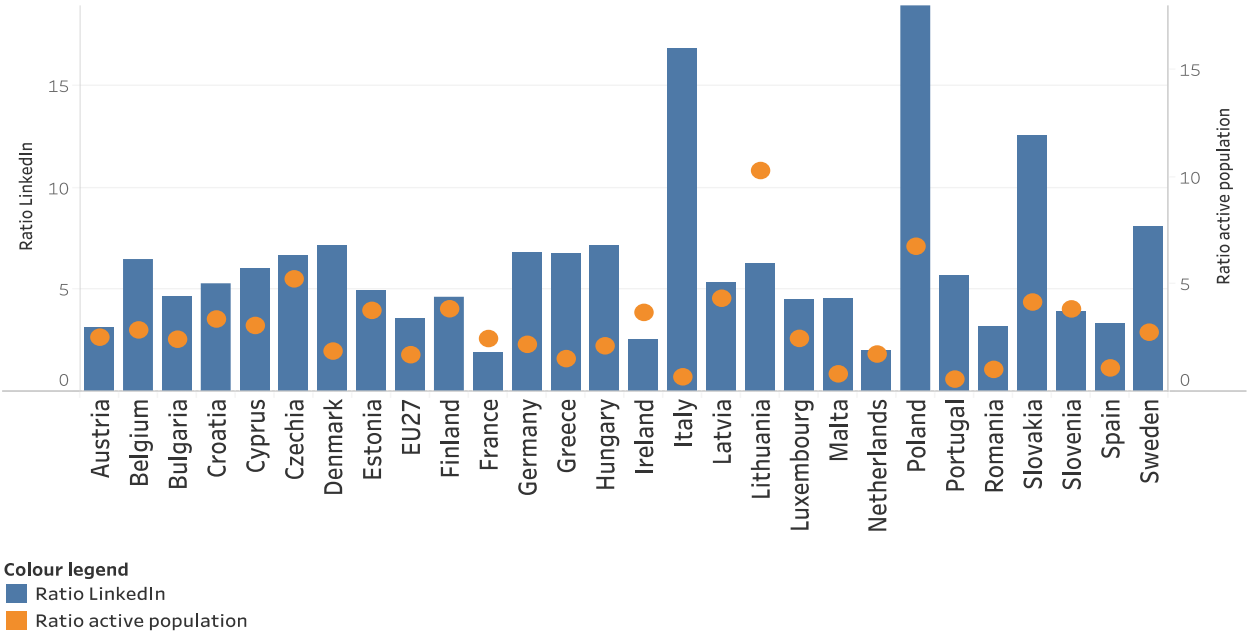
Figure 5: Share of highest educated among LinkedIn users vs active population



Source: LinkedIn and Eurostat (Active population by sex, age and educational attainment [lfsa_agaed] – ISCED 2011 Levels 5-8; 15 to 74 years old; 2018)

From the Figure below one can observe that in most countries (19 EU Member States, and EU27 average), the ratio of the highest educated on the lowest educated is higher among LinkedIn users than in the active population. In other words, among the LinkedIn users for whom the educational attainment is available, the highly educated (master's degree) are overrepresented. This is particularly true for Italy, Portugal and Poland where the difference between the LinkedIn ratio and the active population ratio is the largest.

Figure 6: Educational attainment ratio among LinkedIn users vs in active population



Source: LinkedIn and Eurostat (Active population by sex, age and educational attainment [lfsa_agaed] – ISCED 2011 Levels 0-2 & 5-8; 15 to 74 years old; 2018)

There are few cases where the active population ratio is more important than the LinkedIn ratio, but the difference is generally quite small (<1.5). The only exception is Lithuania, where the difference of ratio therefore indicates that on LinkedIn the lowest educated are overrepresented and/or the highest educated underrepresented.

In general, the lowest educated are underrepresented and/or the highest educated are overrepresented in most of the EU Member States (including EU27 average). In terms of educational attainment, the LinkedIn population is not representative of the active population.

Section 3

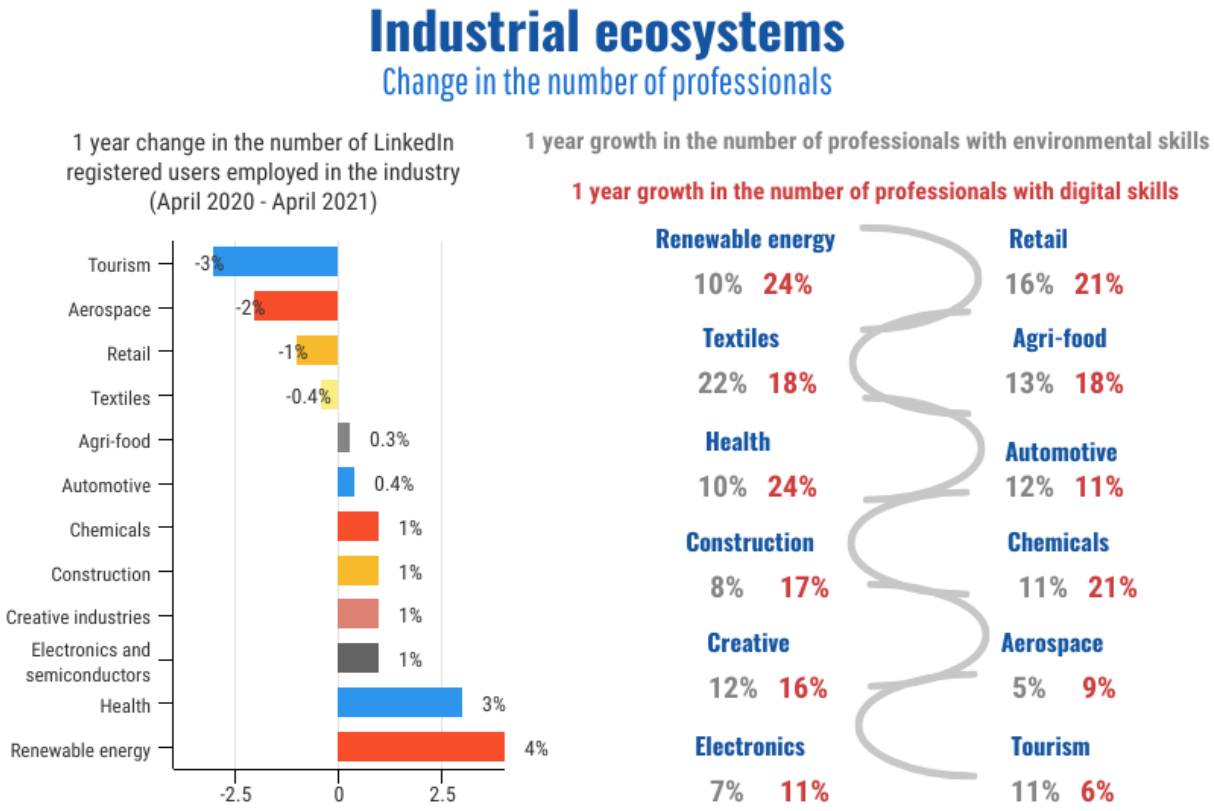
3. Technology talent in industrial ecosystems

3.1 Change in professionals with advanced technology skills

LinkedIn can capture the change over time in the number of professionals with different skillsets employed in specific manufacturing and services industries, hence it can reflect the ongoing dynamics within industrial ecosystems in the period before and since the Covid crisis. The results have to be interpreted with caution, keeping in mind that LinkedIn cannot fully represent the behavior of all industry employees and there is a bias towards the higher educated professionals as presented above in the Section of the methodology.

The results confirm what would be expected notably that the overall number of professionals employed in the Tourism, Aerospace, Retail and Textiles industries has decreased over the period of the pandemic, however it started to catch up again since Spring 2021. Other industries such as Agri-food and Automotive managed to stay stable, while the number has slightly increased in Chemicals, Construction, Creative industries (driven in particular by computer games) and Electronics. Industries that witnessed an increase include Health (pharmaceuticals, medical devices and healthcare) and Renewable energy. This confirms other analysis pointing out that industries were hit to a different extent by the Covid crisis with Tourism as one of the biggest victim[5]. It also points out to a certain resilience in the cases of Automotive, Construction or Chemicals industries or even of the Creative industries where activities could be continued in the digital sphere.

Figure 7: Change in the number of professionals (period of analysis: April 2020 – April 2021)

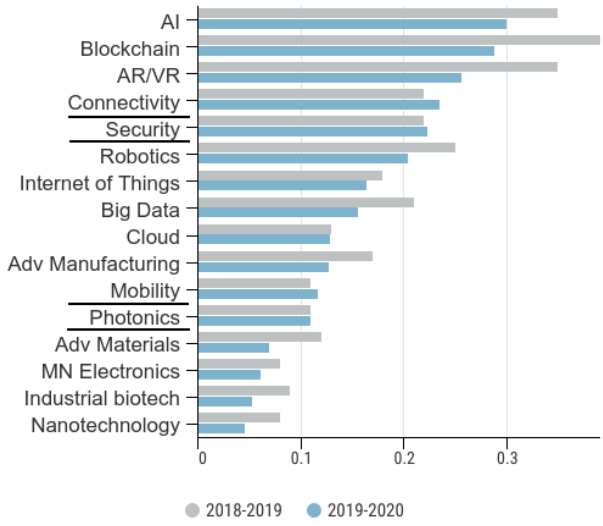


Source: Technopolis Group based on analysing LinkedIn data, 2021

[5] European Commission (2021). COM(2021) 350 final

What is more interesting is the change in the technology skilled professionals. The number of professionals who indicate in their profile possessing skills related to advanced technologies (all 16 monitored as part of the ATI project[6]) has increased across all industries. This confirms the increasing importance of advanced technologies. Nevertheless, the rate of growth dropped in the period of 2019-2020 (overlapping with the period of the Covid outbreak) compared to 2018-2019 (see Figure 8). This finding shows that the Covid period has affected also trends in technological skills development. Industries that had the highest increase in the number of professionals with advanced technology skills (although one has to keep in mind the original lower values) over the period of April 2020 to April 2021 include **Renewable energy, Retail, Textiles and Agri-food**.

Figure 8: 1-year growth in terms of professionals with advanced technology skills registered on LinkedIn in the EU27



Source: Technopolis Group based on analysing LinkedIn data, 2020

LinkedIn data allows us to look at specific skills profiles such as professionals with digital or environmental skills[7]. Zooming into the more specific group of **environmental (green, circular industry) skills**, the analysis found the **highest growth in the number of professionals in the cases of Textiles, Retail and Health** (pharmaceuticals, medical devices and healthcare) (please see the infographics in Figure 7 above).

Digital skills witnessed the highest increase in Renewable energy, Retail, Health and Chemicals. The indicated percentages represent change compared to one year ago (April 2020-April 2021), but do not reflect overall strength in terms of the existing number of professionals with such skills. For instance, Automotive and Electronics are relatively strong in digitally skilled employees but the growth naturally is lower. The Chemicals industry is also in strong need of professionals with environmental skills as the job posts analysis will show in the following sections.

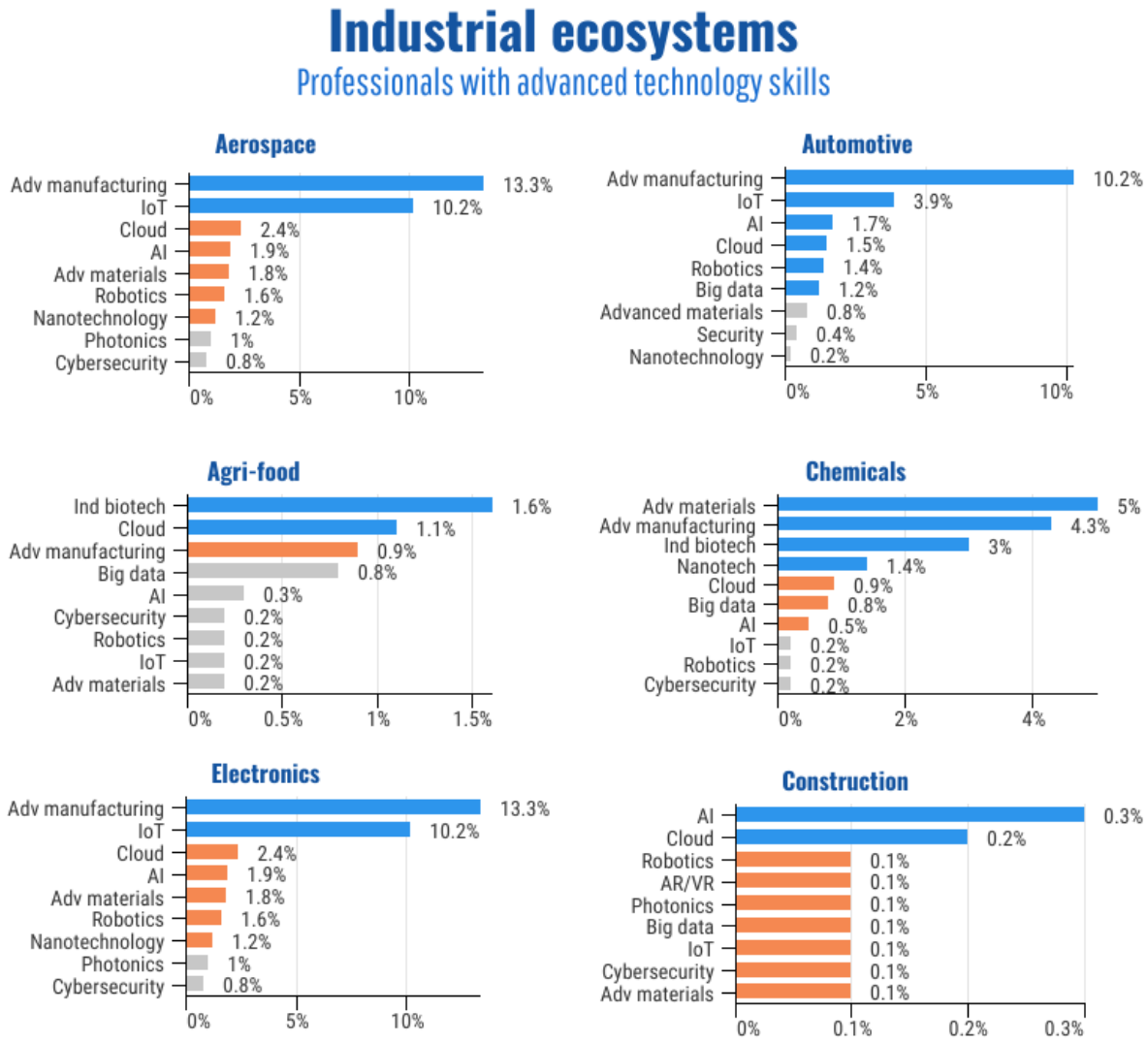
The next Figure displays the share of professionals with specific advanced technology related skills employed across the industries in scope. It shows that industries such as Automotive, Aeospace, Electronics employ in general a higher share of advanced technology skilled professionals. The findings also shed light on the most relevant advanced technologies in terms of professionals employed in the

[6] Technology definitions are available here https://ati.ec.europa.eu/reports/eu-reports/technology-definitions and also in the ATI methodological report: https://ati.ec.europa.eu/reports/eu-reports/advanced-technologies-industry-methodological-report

[7] Digital skills have been defined according to the definition of digital techbnologies including Artificial Intelligence, Augmented and Virtual Reality, Big Data, Blockchain, Cloud technologies, Connectivity, Cybersecurity, the Internet of Things. Environmental skills have been captured with keywords including: Green Technology, Green Building, Green Infrastructure, Biodegradable Polymers, Cleantech, Sustainability, Sustainable Design, Energy Efficiency, Smart Grid, Reuse, Maintenance &Repair, Clean Energy Technologies, Renewable Energy, Photovoltaics, Solar Energy, Sustainable Agriculture, Precision Agriculture, Waste Management, Waste Reduction, E-Waste, Recycling, Water Treatment, Water Resource Management, Water Purification, Green Printing, Carbon Footprinting, Climate Change, Environmental Biotechnology, Environmental Engineering, Environmental Management Systems, Pollution Prevention, Wastewater Treatment, Biodegradation, Circular Economy

various industries: skills related to Advanced Manufacturing, the Internet of Things and Artificial Intelligence appear to be the most transformative.

Figure 9: Share of advanced technology skilled professionals within industry, LinkedIn, 2020-2021



Source: Technopolis Group based on analysing LinkedIn data, 2021

Note: colour legend highlights the most relevant advanced technologies per industry

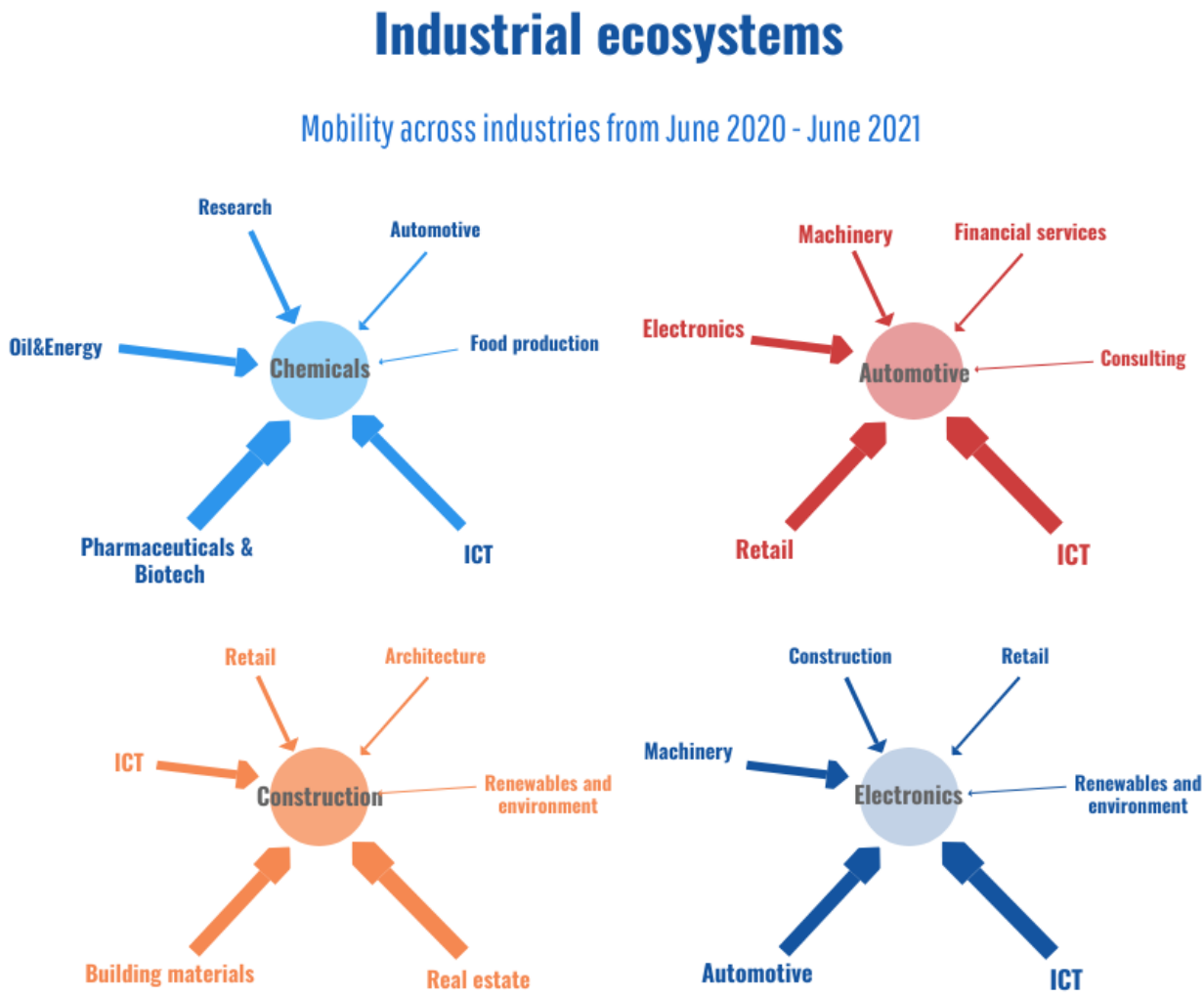
3.2 Mobility patterns of professionals across industries

LinkedIn data allow us to monitor the movement of skilled professionals across industries and it can also reveal how professionals that had to leave one industry have found employment elsewhere during the pandemic period. The gained talent captures the total number of professionals who moved into the selected industry from each of the industries listed in the following diagrams over the past 12 months. Lost talent captures the number of professionals who moved out of the selected industry into each of the other industries listed over the past 12 months.

First, we provide an overview about the most relevant movements into a selected number of industries and then about the mobility of professionals that left the most disadvantages industries of the pandemic.

The findings reveal interesting patterns. Industries that managed to stay stable overall after one year of the pandemic such as Automotive, Chemicals, Construction and Electronics have gained talent from various other industries. Automotive has been strongly linked to ICT, Retail, Electronics and Machinery. Chemicals gained talent from Pharmaceuticals/Biotech, but also ICT which reflects the ongoing trends in digitalisation. Oil&Energy is on the third place. Construction gained talent (excluding civil engineering and mechanical engineering) from Real estate and Building materials. Electronics was connected most to ICT, Automotive and Machinery.

Figure 10: Mobility of talent to Automotive, Chemicals, Construction and Electronics industries from other industries

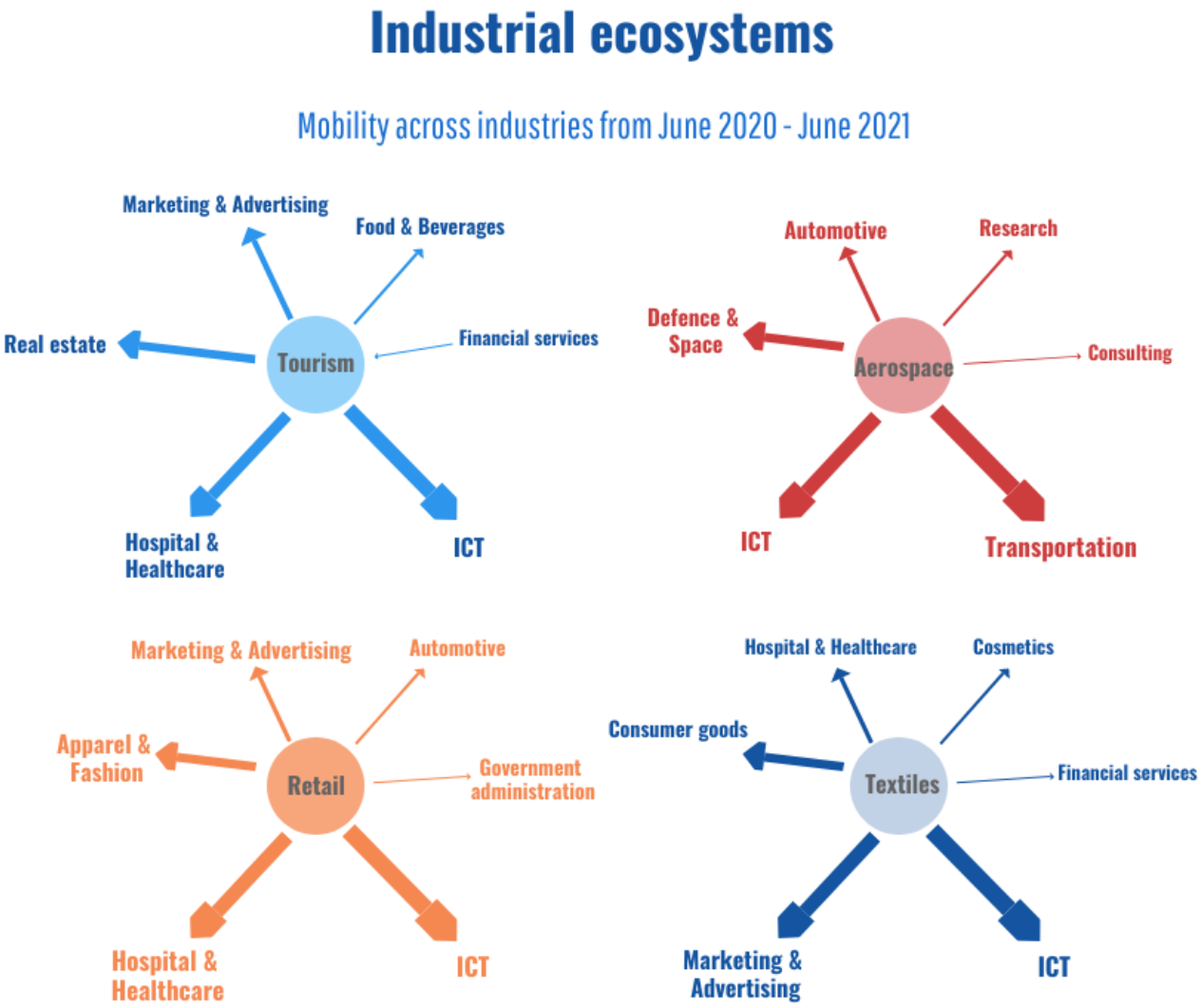


Source: Technopolis Group based on analysing LinkedIn data, 2021

The net positive change (the number of gained talent minus lost talent), however has been the strongest among the following industries:

- Automotive gaining the highest number of net talent from Retail, Tourism and Aerospace and losing talent most to ICT, Electronics and Renewables
- Chemicals gaining the highest number of net talent from Oil & Energy, Automotive and Research and losing talent most to Pharmaceuticals, Medical devices and Building materials
- Construction gaining net talent from Retail, Automotive and Machinery and losing towards Government administration and Real Estate.
- Electronics gaining net talent from Automotive, Retail and Machinery and losing talent towards Renewables, ICT and Medical devices.

Figure 11: Mobility of talent from Tourism, Aerospace, Retail and Textiles industries towards other industries



Source: Technopolis Group based on analysing LinkedIn data, 2021

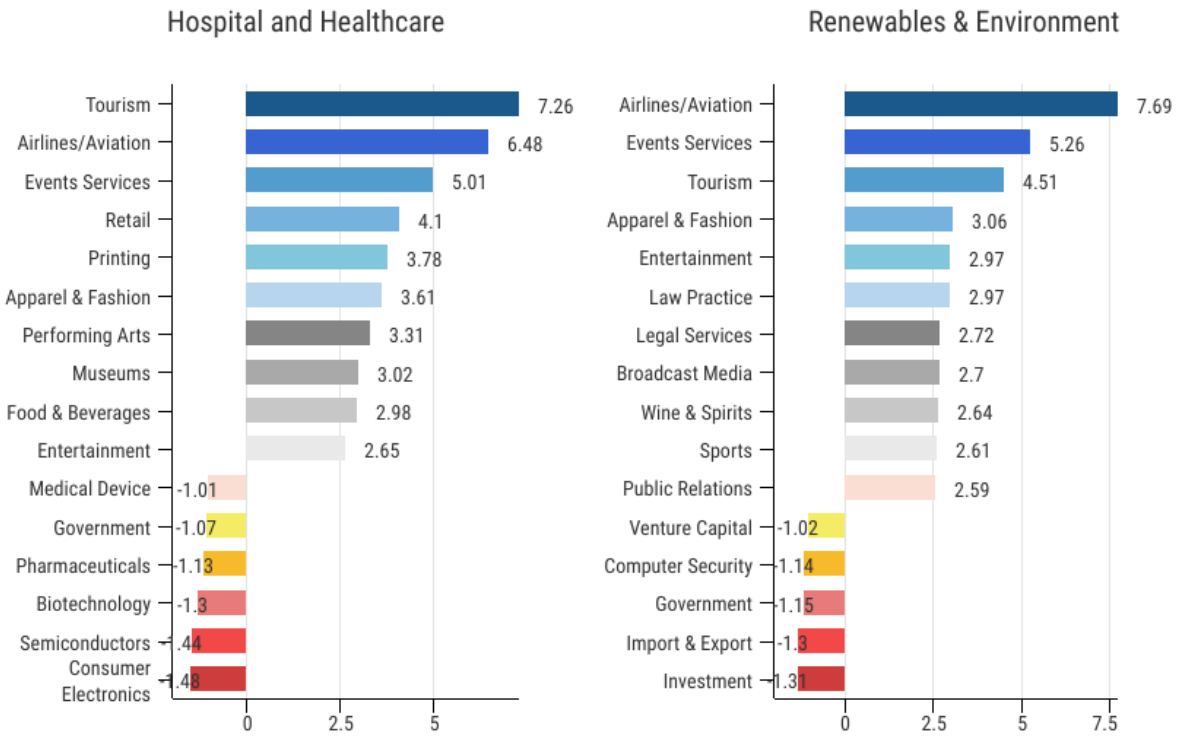
The net positive change (the number of gained talent minus lost talent), however has been the strongest among the following industries:

- Tourism gaining the highest number of net talent from Airlines & aviation, and losing talent most to ICT, Hospital&Healthcare and Real estate
- Aerospace gaining the highest number of net talent from Oil & Energy, Automotive and Research and losing talent most to Pharmaceuticals, Medical devices and Building materials
- Retail gaining net talent from Tourism and Apparel&Fashion and losing towards Hospital & Healthcare and Government administration.
- Textiles gaining net talent from Retail and Tourism and losing talent towards ICT, Hospital & Healthcare and Real estate.

Hospital&Healthcare has been one of the industries that have attracted the most professionals during the pandemic. It has also managed to absorb a few professionals from other industries usually not much connected with in terms of employee mobility. For instance, during the period from June 2020 – June 2021 the ratio comparing the number of professionals gained compared to professionals lost by hospital&healthcare has been the highest - 7.26 for tourism and 6.48 for airlines/aviation. Even if professionals in these sectors do not immediately have the adequate qualifications and the overall

number stays low, an increase can be observed in terms of intersectoral mobility. Similarly, Renewables&Environment has witnessed an increased mobility of professionals arriving from Airlines, Events services or the Tourism industries. Hospital&Healthcare lost the most talent towards the Medical devices, Government, Pharmaceuticals and Electronics industries, while Renewables&Environment towards Investment management and Government industries. The Figure below displays only the top positive and negative ratios in order to reflect trends and highlight new patterns besides the usual links among industries.

Figure 12: Hospital&Healthcare and Renewables&Environment top gains from and top losts towards other industries, June 2020-June 2021



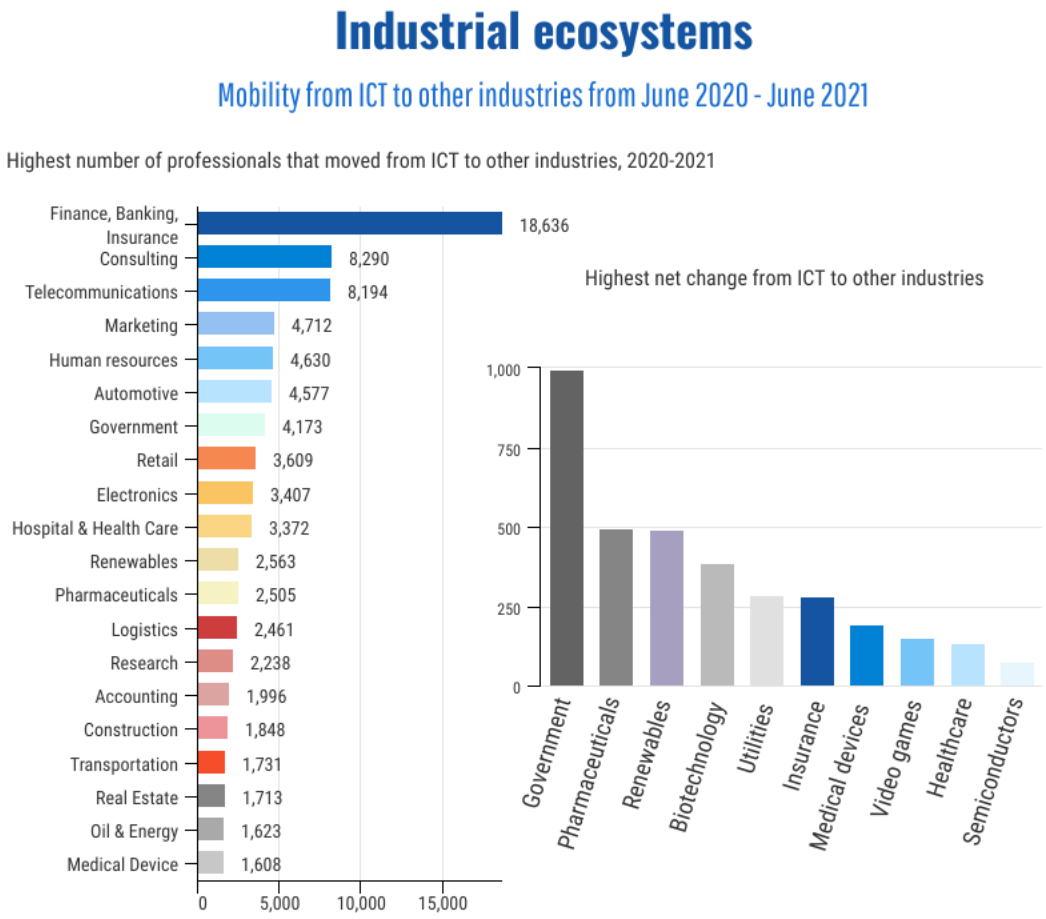
Source: Technopolis Group based on analysing LinkedIn data, 2021

As an overall trend, one can observe the increased intersectoral mobility between the ICT and other industries, which has accelerated during the pandemic period. The analysis of LinkedIn data shows that **the highest number of professionals moved from ICT to Finance, Banking and Insurance**, which confirms the important trend of digitalisation of financial services sector. This is followed by **Management Consulting, Telecommunications and Marketing&Advertising**. Links are also relevant with Human resources, Automotive and also Government.

In the period from June 2020 to June 2021, the highest **net change happened with Government, Pharmaceuticals and Renewables&Environment** that reflects a new demand for professionals with digital skills in these industries.

Other manufacturing industries such as Chemicals, Textiles or Food are at the bottom of the list that confirms the lower level of digitalisation of these industries, although there are also positive trends to be observed as highlighted above.

Figure 13: Inter-industry mobility from ICT to other industries



Source: Technopolis Group based on analysing LinkedIn data, 2021

3.3 Changes in skills demand across industries

Each industry employs people with a specific skillset that is particular for the activities carried out and the related competences required.

Companies registered on LinkedIn and belonging to a specific industry publish job posts/vacancies online and indicate the skills those posts require. The analysis of these skills over the period from June 2020 to June 2021 shows some common patterns across industries notably the growing demand for skills such as analytics, programming, creativity skills and customer relationship management.

In the case of Automotive and Electronics, **automation and embedded systems (notably IoT)** are among the fastest growing skills demanded.

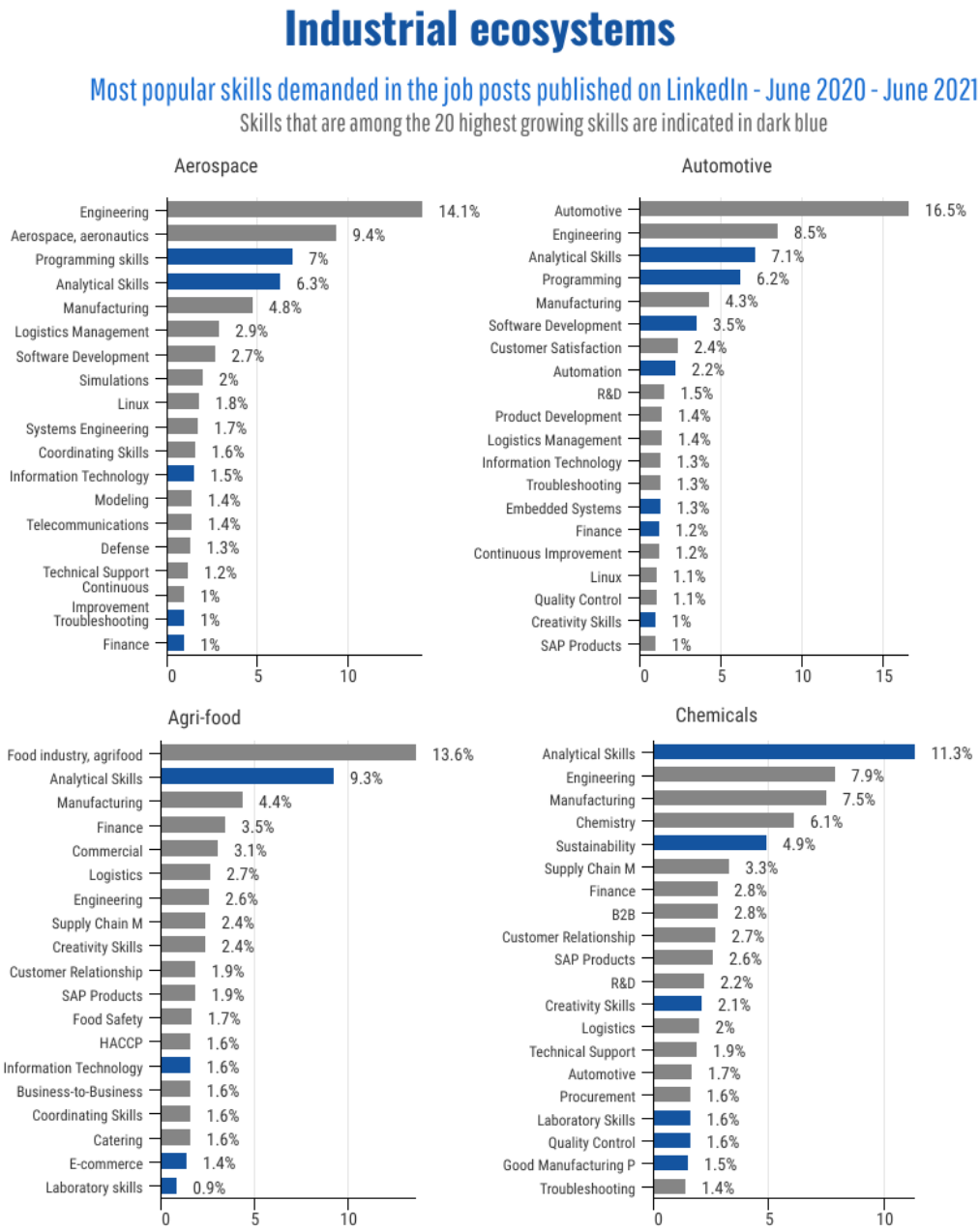
In the case of the Aerospace industry, although it has been hit hard by the pandemic and subsequent lockdowns and had a reduced number of job posts, the skills demanded include various **analytical and programming** skills besides engineering and manufacturing that is standard. Another skillset that has been growing fast is **Simulation and Simulink**. Simulink is a MATLAB-based graphical programming environment that supports the modelling and simulation of product development.

Chemicals industry has been one of the industries where **sustainability and environment related skills** are on the list of top skills required.

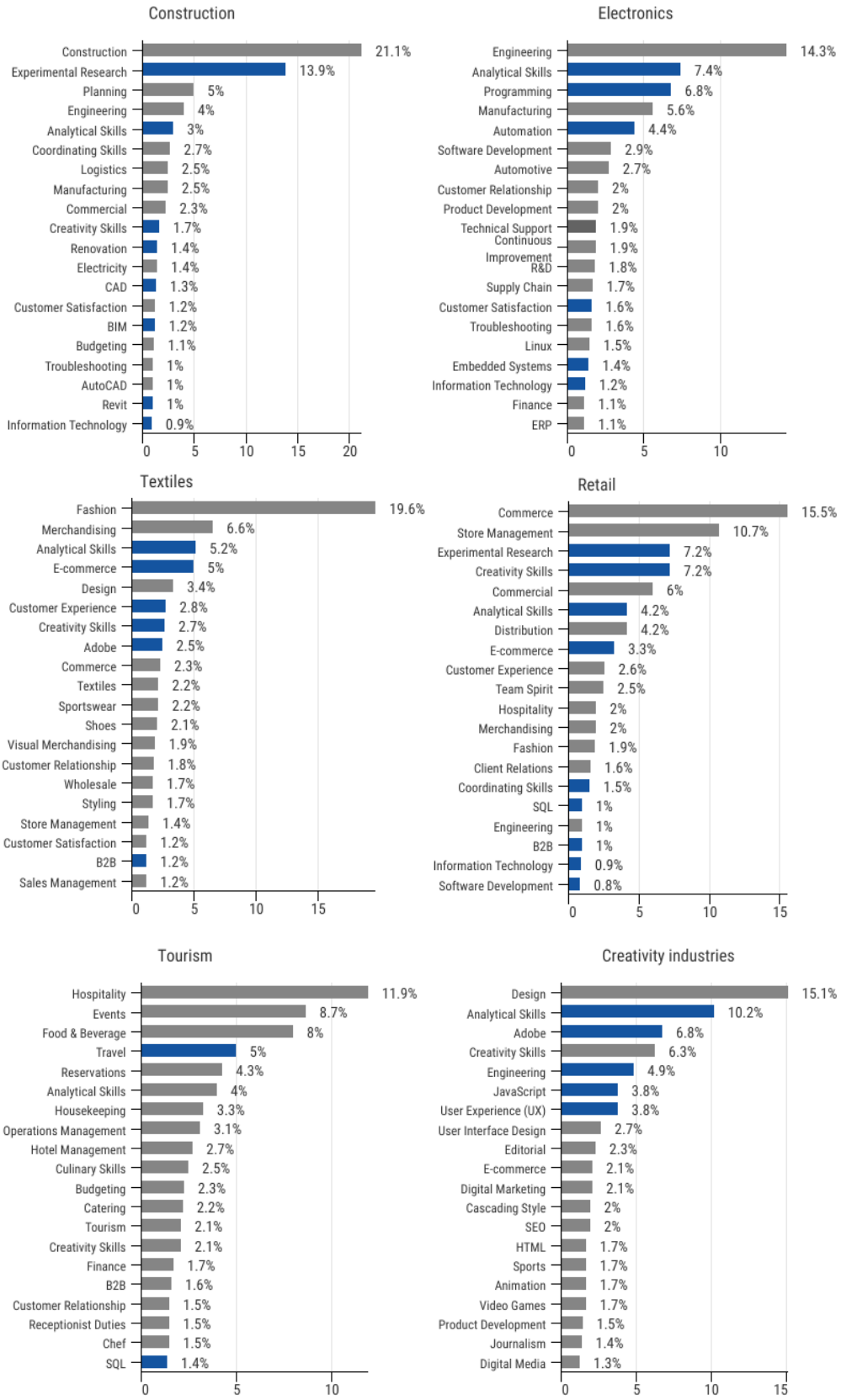
The Agri-food industry has also published a growing number of vacancies for **data analysts but also laboratory skills and quality control** have been on the list of top skills required.

The lack of job posts reflects also the difficult situation of the Tourism industry over the past year. The required skills include mostly traditional tourism related competences and the analysis of job posts do not reflect any digital or green transformation.

Figure 14: Most popular skills demanded in the job posts published on LinkedIn by the various industries in the focus of this report over the period from June 2020 to June 2021



Source: Technopolis Group based on analysing LinkedIn data, 2021



Source: Technopolis Group based on analysing LinkedIn data, 2021

3.4 Conclusions

Industrial ecosystems across the EU27 have been affected by the Covid crisis to varying extents. They were hit not just in terms of production and turnover but also with regard to employment and the composition of their technology talent. Tourism, Aerospace, Retail and Textiles industries have witnessed the most drop in talent, while other industries such as Agri-food and Automotive managed to stay stable or even to further expand such as Chemicals, Construction, Creative industries (driven in particular by computer games) and Electronics.

Advanced technology talent has been distributed unevenly across industries in the EU27. Some industries attract far way more talent such as Automotive, Aeospace and Electronics. Previous analysis under ATI[8] found that Advanced Manufacturing skilled professionals have been concentrated in manufacturing industries such as Automotive, Electronics but also Construction. Artificial Intelligence skilled professionals have been employed most in Automotive while Augmented and Virtual reality in the Creative industries across the industrial ecosystems in the focus of this report.

The LinkedIn analysis suggests that the start of the Covid crisis has slowed down the growth in the number of advanced technology skilled professionals but despite the early halt the number of professionals with advanced technology skills kept on increasing across all industries. These trends confirm the importance of advanced technologies in the recovery of all industrial ecosystems.

Over the first year of the Covid crisis, the number of professionals with advanced technology skills increased the most compared to the status a year ago in Renewable energy, Retail, Textiles and Agri-food. Even if advanced technology skills (except for the Renewables sector) are not widespread in these industries, these results point at the fact that technological change is becoming a daily reality. Environmental (green, circular industry) skills witnessed the highest growth in the fields of Textiles, Retail and Health (pharmaceuticals, medical devices and healthcare), while digital skills in Renewable energy, Retail, Health and Chemicals.

The mobility of skilled professionals shows that industrial ecosystems are connected to each other in specific ways. Automotive has been strongly linked to ICT, Retail, Electronics and Machinery. Chemicals gained talent from Pharmaceuticals/Biotech, but also ICT which reflects the ongoing trends in digitalisation. Construction gained talent (excluding civil engineering and mechanical engineering) from Real estate and Building materials. Electronics was connected most to ICT, Automotive and Machinery.

The analysis showed that technologies that are becoming more relevant for the industries in the focus of the report include Advanced Manufacturing, the Internet of Things and Artificial Intelligence related skills. In the case of Automotive and Electronics, automation and embedded systems (notably IoT) are among the fastest growing skills demanded. In the case of the Aerospace industry, although it has been hit hard by the pandemic and subsequent lockdowns and had a reduced number of job posts, the skills demanded include various analytical and programming skills besides engineering and manufacturing. Chemicals industry has been one of the industries where sustainability and environment related skills are on the list of top skills required. The Agri-food industry has also published a growing number of vacancies for data analysts but also laboratory skills and quality control have been on the list of top skills required.

[8] https://ati.ec.europa.eu/reports/policy-briefs/meeting-sectoral-skills-challenge-advanced-technologies

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About the 'Advanced Technologies for Industry' project

The EU's industrial policy strategy promotes the creation of a competitive European industry. In order to properly support the implementation of policies and initiatives, a systematic monitoring of technological trends and reliable, up-to-date data on advanced technologies is needed. To this end, the Advanced Technologies for Industry (ATI) project has been set up. The project provides policymakers, industry representatives and academia with:

- Statistical data on the production and use of advanced technologies including enabling conditions such as skills, investment or entrepreneurship;
- Analytical reports such as on technological trends, sectoral insights and products;
- Analyses of policy measures and policy tools related to the uptake of advanced technologies;
- Analysis of technological trends in competing economies such as in the US, China or Japan;
- Access to technology centres and innovation hubs across EU countries.

You may find more information about the 16 technologies here: https://ati.ec.europa.eu.

The project is undertaken on behalf of the European Commission, Directorate General for Internal Market, Industry, Entrepreneurship and SMEs and the European Innovation Council and SMEs Executive Agency (EISMEA) by IDC, Technopolis Group, Capgemini, Fraunhofer, IDEA Consult and NESTA.

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