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**COVID-19 Pandemic and the Fourth Industrial Revolution:
Opportunities to Shape a New Labour Market?**

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Abstract

Today, COVID-19 and the Fourth Industrial Revolution have caused a double disruption to global jobs. The global unemployment rate increased by 20.48% in 2020 compared to 2019. The World Bank draws the conclusion that the increase in unemployment was mainly due to the emergence of the health crisis that affected the economy of countries around the world. The paper provides an overview of the most relevant changes in the actual labour market in the framework of COVID-19 and the Fourth Industrial Revolution challenges. According to the World Economic Forum, 50% of currently employed workers will need reskilling by 2025 to adapt to changes in the labour market. Furthermore, by 2025, 85 million jobs will disappear from the labour market because of the confrontation between human capital and machines, while 97 million new jobs will emerge. These jobs will emerge through a hybrid between human capital, machines, and algorithms. Examples of such jobs are DevOps engineers, Artificial Intelligence Specialist, and Digital Marketing Managers. The COVID-19 restrictions have led to numerous changes in the labour market, since a large part of the employed workforce had to work from home and learn to use digitalization. The global labour market has not recovered from this health crisis. A challenge for governments is to find solutions that can help economies anticipate skills gaps, manage pressures on workers, and map a path for a more innovative and resilient economy in the future. Governments, companies, and societies should cooperate in reskilling and upskilling the employed workers to provide modern education skills and proper jobs.

Keywords: COVID-19 pandemic, the fourth industrial revolution, new labour market.

JEL Classification: I15, I18, O14, O15, O33.

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1. Introduction

It is generally accepted that the flexibility of the labour market can be greatly influenced by many rigidities. Consequently, the future of the labour market is attracting considerable interest due to the current implications of the COVID-19 pandemic and the Fourth Industrial Revolution.

Moreover, it is widely considered today that the Coronavirus pandemic and the Fourth Industrial Revolution will cause multiple key changes to the labour market. The health crisis caused an increase in the unemployment rate, high disparities between people who worked from home and people whose jobs did not permit that, and income losses to companies and workers. In addition, companies have started to redesign their infrastructure and introduce a hybrid system at work.

When it comes to the Fourth Industrial Revolution or Industry 4.0, as it is otherwise called, the labour market is continuously adopting new innovative technologies. The Coronavirus pandemic accentuated the process of digitalization and automation due to the need to work from home during lockdowns. However, disruptions caused by both the health crisis and Industry 4.0 may cause in the future the disappearance of a large number of jobs. For this reason, the State's involvement is essential in reskilling and upskilling the existing workforce. A new perspective for a balanced future of work would be cooperation between policymakers, companies, and people.

This paper examines the impact of COVID-19 and the Fourth Industrial Revolution on the future of the labour market. Actual challenges could develop and redesign the world of work and shape a more competitive global labour market. Given these points, this study is expected to highlight the major implications of the current health crisis and Industry 4.0 on the field of work.

2. Problem Statement

The global labour market was severely affected by the outbreak of the COVID-19 pandemic that resulted in a global health crisis. The health crisis affected both the lives of people and the global economy. For this reason, more and more researchers began to investigate the future of the labour market, considering that COVID-19 and the Fourth Industrial Revolution could create new opportunities for the world of work.

The global unemployment rate increased by 20.48% in 2020 compared to the previous year (The World Bank, 2021). Furthermore, the highest global unemployment rate from 1991 to 2020 was recorded in 2020. Evidence shows that decreasing unemployment rates were caused by lockdowns and restrictions imposed in every country in the world during the health crisis (The World Bank, 2021). Moreover, a large number of workers have become unemployed or have temporarily entered into a non-paid period of inactivity. As a consequence, governments around the world attempted to overcome the socioeconomic impact of the Coronavirus pandemic and supported both businesses and employees through stimulus packages and policy measures (Ilsoe, Larsen, 2020; OECD, 2022).

The evolution of unemployment in the European Union between 1991 and 2020 highlights low unemployment rates during the periods 1993-1997 and 2009-2015. Following the course of economic history, the European labour market was heavily hit at the beginning of the 1990s by the industrial restructuring caused by the collapse of the Soviet Union, generating an increase in unemployment. In response to these challenges, employment became the first priority of the European Union, as mentioned in the Commission's white paper on 'Growth, competitiveness, and employment' (European Parliament, 2020). Unemployment also increased when the EU's economy was hardly hit by the global financial crisis of 2008. European statistics show that the outbreak of COVID-19 caused a reduction in overall employment (The World Bank, 2021). The highest unemployment rate from 1991 to 2020 was recorded in 2020. In September 2020, Spain, France, and Italy recorded the highest number of unemployed, compared to other EU countries. Spain is a European country that experiences long-term structural unemployment caused by a low share of industry in the national economy. The Spanish economy is mainly based on tourism and construction. In the case of France, the high number of unemployed persons is explained by an increased number of low-skilled persons and high unemployment among young and elderly people. Similarly, the large number of unemployed persons in Italy was primarily caused by high unemployment rates amongst young people and women.

Initially, the recovery of the labour market depended on vaccination coverage. Furthermore, the International Labour Organization (2021) pointed out in a recent report on COVID-19 and the world of work that fourteen vaccinated people were the equivalent of a newly created job. The alarming situation regarding the spread of COVID-19 is stable now since the countries increased the vaccination rate. However, many people consider the vaccination rate as a passport to freely circulate and travel throughout the world in the current period, since the situation caused by the Coronavirus pandemic has become more and more established.

The COVID-19 restrictions imposed by governments have transformed the labour market: work from home has become a better opportunity for people from different industries, traditional jobs were replaced with technology and artificial intelligence, and remote work paved the way for new job opportunities. Therefore, the COVID-19 pandemic and technological advancements can lead in the near future to the so-called 'jobs of tomorrow'. The World Economic Forum (2020) describes "jobs of tomorrow" as jobs created in new fields, with new occupations, or just the revolution of the existing occupations.

The flexibility of the labour market is particularly significant during global crises. If the labour market is flexible and not rigid, it increases the capacity of the country's economy to absorb shocks triggered by an economic or social crisis (Şerban, 2015). The rigidity of the labour market was a threat to most countries during the COVID-19 pandemic. Trends in the labour market during the health crisis highlight that worldwide companies and workforces experienced major challenges, such as digitalization or the transition process from classical work to a new type of work, work from home (Piroșcă et al., 2021; Scutariu et al., 2021; Zamfir, Aldea, 2020).

In the opinion of Vyas (2022), the COVID-19 pandemic accelerated significant changes in the labour market, such as increasing trends in digital transformation, diversification of hybrid work, return to office work, business changes related to infrastructure and labour mobility, the disappearance of traditional jobs with a low-skilled workforce and the rise of 'jobs of tomorrow', and the reinterpretation of work-life balance. However, a part of these variables existed before the outbreak of the Coronavirus pandemic. For example, the era of digital transformation has already been present in global markets. Countries that experienced high levels of digital skills attracted more companies interested in investing in the national business environment (Piroșcă et al., 2021).

Sanitary, economic, and technological disturbances shape the current labour market. According to Harari (2018), the current technological revolution will create new jobs in the future, based on artificial intelligence, machine learning, and big data. The situation is similar to the first industrial revolution, when the emergence of machine tools left many workers without a job and created new ones. The Israeli author also states that in more than twenty years the labour market could be characterised by the cooperation between artificial intelligence and the human brain.

The future labour market will inevitably include new models of businesses and new types of jobs. In the opinion of Briciu & Briciu (2020), in addition to new jobs, specialists should also focus their studies on the skills necessary for the new jobs. New skills are correlated with emotional, computational, and social intelligence, virtual working, design mentality, and media education. Consequently, existing skills will not be sufficient in the future, and people will have to have modern skills. This case will be difficult for the elderly since many of them do not have digital skills and do not understand the meaning of the Internet of Things.

The Coronavirus pandemic developed the e-commerce and automation sectors and accelerated the decisions of entrepreneurs to upgrade their businesses over the Internet. Additionally, remote work has become an opportunity for many workers to work from home and for companies to reshape their organizational management.

People and companies around the world will suffer or benefit from the transformation of the labour market due to changes caused by the COVID-19 pandemic and the Fourth Industrial Revolution. In this perspective, policymakers must support the transition process to a new labour market. People should accumulate new skills and prepare for new occupations, and companies should protect their current workforce.

3. Research Questions

The purpose of this work is to investigate the impact of the COVID-19 pandemic and the Fourth Industrial Revolution on the future labour market in order to have an overview of the current challenges occurring in the international markets. The research questions underline the changes that occur in the current labour market:

Q1. Will the COVID-19 pandemic create new jobs in the global labour market?

Q2. Has the COVID-19 pandemic accelerated the expansion of digital skills?

Q3. Has the Coronavirus pandemic reshaped remote work (RW)?

Q4. Will the Industry 4.0 will change future jobs?

4. Research Methods

This paper aims to examine the relevant theoretical background related to current challenges in the labour market and to perform an analysis of developments occurring in the labour market in the framework of COVID-19 and the challenges of the Fourth Industrial Revolution. In the second part of the work, future jobs, digitalization, and remote work were included in the analysis of the current labour market. For this purpose, the study used official statistics and databases from several institutions specialized in issues related to the labour market and Industry 4.0, such as the International Labour Organization, World Economic Forum, McKinsey Global Institute, European Commission, OECD, UNCTAD, and Statista.

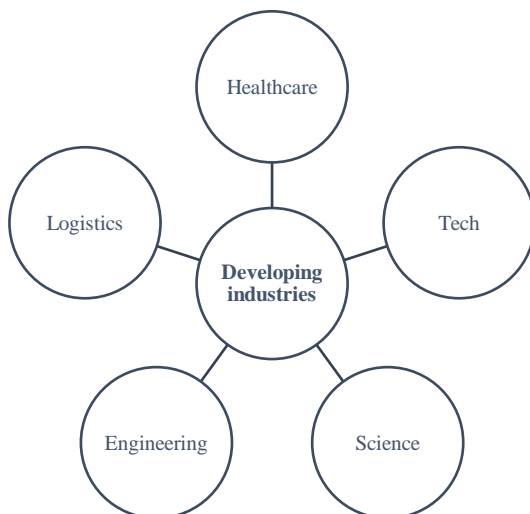
5. Findings

Q1. Will the COVID-19 pandemic create new jobs in the global labour market?

The future of work after COVID-19 has started to be an exploration topic for recent conferences. Many researchers attempt to identify what the future labour market looks like and what types of jobs should people prepare for now.

Today, the global labour market is affected by the challenges created during the Coronavirus pandemic. The increasing use of digital technologies and digital learning may generate in the future the reskilling of the current workforce. According to McKinsey Global Institute (2021), people should now focus their skills on developing industries that will ensure them secure jobs in the future.

Figure 1. Developing industries in the post-Coronavirus pandemic scenario



Source: Author projection based on McKinsey Global Institute, 2021.

OECD (2022) outlined that the health crisis will transform the labour market into a social crisis, as many inequalities between workers were created. Low-wage

workers were the most affected by the health crisis compared to high-wage workers that have had the opportunity to work from home. Policymakers and companies are the main actors that can support workers to reskill and adapt to a new labour market.

According to the Global Entrepreneurship Monitor (2022), the COVID-19 pandemic created both challenges and opportunities for entrepreneurs and employees. Entrepreneurs create employment, and changes in entrepreneurial activity will also create changes in employment. During the COVID-19 pandemic, many of the employees have identified new business opportunities that have transformed them into current entrepreneurs. On the other hand, an increased number of jobs started to be threatened by the innovative technologies that companies have implemented as a result of the measures and restrictions imposed in every state in the world. Moreover, companies started to change their organizational infrastructure, since remote work opened new work opportunities.

Q2. Has the COVID-19 pandemic accelerated the expansion of digital skills?

The digital economy is of particular interest to the European Union, since digital technologies open in the current period numerous opportunities for people and companies. The COVID-19 crisis has considerably increased the use of digital technologies because during the health crisis, worldwide workers had to work from home and young people attended online courses. Similarly, global Internet traffic exceeded Internet traffic in recent years (UNCTAD, 2021).

In terms of the worldwide digital population, approximately 65% of the global population are Internet users, according to Statista (2022b). In the post-Coronavirus scenario, the internet has become a key pillar in the transition process toward a digitalized economy. The highest number of internet users was recorded in China, India, and the USA.

In the United States, the digital economy recorded an increase in the last years, mainly during the Coronavirus pandemic (Bureau of Economic Analysis, 2022). Infrastructure, e-Commerce, and priced digital services are the main components included in the digital economy within the United States. Among these components, priced digital services register the highest gross output, and are followed by infrastructure and e-Commerce.

The digital economy in China has a long history, with the actual percentage of retail e-Commerce being more than 50% of total retail transactions (Wong, Wihardja, 2022). Moreover, China is the global leader in the Digital economy, particularly in the e-commerce field (McKinsey & Company, 2017). The COVID-19 pandemic increased digitalization in China and the level of economic growth (Frontiers in Public Health, 2022).

In the transition process toward a digital economy and society, the European Union integrated four variables to be fully fulfilled: (1) Digital skills (2) Digitalization of companies, (3) Sustainable digital infrastructure, and (4) Digitalization of public services (European Commission, 2021). According to the Digital Economy and Society Index of the European Commission (2021), the most digital four economies in the European Union are Denmark, Finland, Sweden,

and the Netherlands. The index included four dimensions related to human capital, connectivity, integration of digital technologies, and digital public services.

On the opposite side of the ranking were Romania, Bulgaria, Greece, and Poland. Statistics indicate significant discrepancies between European countries in terms of digital technologies and digital skills. Consequently, governments should make further investments in digitalization. Zamfir and Aldea (2020) pointed out in their study that a high level of digitalization depends on the educational level of individuals, and the more educated people are, the higher the level of the digital economy.

E-commerce has risen steeply during the health crisis due to distance restrictions and lockdowns all over the world. According to Statista (2022b), retail e-commerce increased by 47.35% in 2021 compared to 2019. Additionally, Statista's predictions reveal that retail e-Commerce will increase considerably by 2025.

Q3. Has the Coronavirus pandemic reshaped remote work (RW)?

The use of the Internet in the world allowed workers to carry out their jobs from home during the COVID-19 pandemic. In a post-COVID-19 pandemic scenario, will increase Internet usage significantly. The Internet transformed the labour market into a modern labour market and the situation was fostered by the health crisis. According to the Statista (2022) database, the highest number of Internet users is recorded in China, India, and the United States.

A large number of workers ended up working from home due to the social distancing measures introduced in all countries of the world (Eurostat, 2021). Moreover, the end of the health crisis raises questions concerning the number of jobs that can be performed from home. Dingel and Neiman (2020) stated that in the United States of America, approximately 37% of the jobs could be performed from home in 2020. In a post-COVID-19 pandemic scenario, Holgersen et al. (2021) highlight that 38% of the current jobs can be performed from home in Norway.

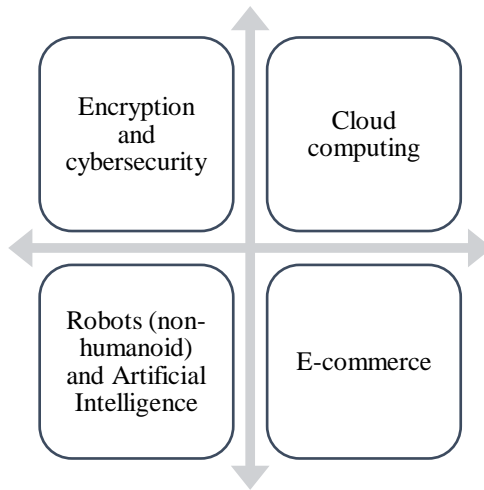
According to recent data concerning the US remote work trends (Statista, 2022a), before the COVID-19 pandemic, 17% of the workforce worked 5 days per week from home and 47% never worked from home. After the Coronavirus pandemic, 44% of the workforce started to work from home. In the European Union, 5.4% of workers used to work from home before the COVID-19 pandemic (European Commission, 2020). The most common industries where people worked from home were IT and communication services, business services, education, creative activities, and real estate.

The impact of the Coronavirus pandemic on the normal work-life balance of people can be noticed. Today, researchers attempt to design new models of hybrid work or remote work that will not decrease the productivity of the workers. However, governments and companies should implement measures that will optimize the transition process to productive work models.

Q4. Will the Industry 4.0 will change future jobs?

According to the World Economic Forum (2020), by 2025, 85 million jobs will disappear from the global labour market due to the conflict between human capital and machines, while 97 million new jobs will emerge. These jobs stand out through a hybrid between human capital, machines, and algorithms. For example, DevOps engineers, Artificial Intelligence specialists, and Digital Marketing managers are future jobs that people should prepare for. Engineering, cloud computing, data and artificial intelligence, and product development are innovative technologies that will be included in the future labour market.

Figure 2. Innovative technologies that companies will adopt by 2025



Source: Author projection based on the World Economic Forum, 2020.

During the COVID-19 crisis, e-Commerce began to be a major alternative that ensured the continuation of business activities in the online environment. Likewise, e-commerce created multiple opportunities for people to increase their online shopping activities. It follows from these circumstances the significance of the digital economy and digital skills. However, the evolution of e-Commerce is dependent on e-commerce policies (OECD, 2020).

McKinsey Global Institute (2021) noted that the COVID-19 pandemic accelerated the introduction of Artificial Intelligence and automation in worldwide companies as a result of COVID-19 restrictions related to workplace density. Companies will benefit from automated industrial processes, while workers will experience job losses caused by the fourth industrial revolution. The research also includes issues concerning future occupations in a post-Coronavirus scenario. According to their outcomes, occupations in the field of Internet, Artificial Intelligence, and health care will increase over the next ten years. Middle-wage occupations may slowly disappear in the future and be replaced by robots and revolutionary machines.

6. Conclusions

Overall, the results indicate that COVID-19 will create new jobs in the global labour market. Furthermore, the world's population will experience new jobs in innovative industries. Current employees could encounter the necessity of reskilling to survive in the future labour market. The COVID-19 pandemic accelerated the expansion of the digital economy within all countries of the world. Similarly, digital skills have become of great importance in the current period. The coronavirus pandemic increased the use of remote work in companies all over the world and could transform the future organization of businesses. Moreover, a large number of workers chose to work in the future from home or in a hybrid organization. The Fourth Industrial Revolution will change future jobs through new innovative industries that have increased in the last few years and during the COVID-19 pandemic. In conclusion, political players, international companies, and employees should cooperate to support the transition from traditional work to a new labour market.

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