

# Analysis of the social and economic effects of COVID-19 on the labour market

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**Abstract.** Contemporary trends in the labour market development are manifested in the context of the COVID-19 epidemic, which has become a trigger for new processes in almost all areas of life around the world. On that basis, the purpose of the work is to identify modern socio-economic effects in the context of a pandemic crisis, to reveal in action the ‘structural effect of wage differentiation’. The methodological basis of the research is the methods of structural and statistical analysis, systematic, comparative and interdisciplinary approaches, graphic modelling. The article highlights the ‘shocks’ of supply and demand, which increase structural imbalances in the labour market in the pandemic. Specific socio-economic effects are identified (the structural effect of wage differentiation, the effect of hybrid jobs, the effect of washing out generations, the effect of the collapse of professions, the effect of staff burnout, the effect of dissatisfaction with personnel, the effect of profession change mobility and effect of gender inequality), which in synergy lead to an increasing imbalance in the labour market. Based on statistical data for 2019-2021, presented is an assessment of the ‘structural effect of wage differentiation’, which indicates a faster decrease in the pace of working hours compared to the reduction in the total wage bill due to rising unemployment in the economy during the pandemic.

**Keywords:** unemployment, employment, labor market, structural shifts.

## 1 Introduction

The Covid-19 pandemic has been a completely unprecedented event, that has significantly affected the labour market in every country and in the world as a whole, accelerated the implementation of established trends and changed their forms of manifestation. First of all, this impact is caused by the restrictive measures and actions of state governments in the development and implementation of plans to combat the pandemic. In this regard, the impact of supply and demand shocks in the labour market on employment, the dynamics of working hours and wage size become relevant. In this context, special focus should be put on the analysis of socio-economic effects, which, due to synergy, led to the emergence of new structural shifts and strengthening of the labour market disproportions already known.

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Various aspects of changes in the labour market associated with the pandemic are being actively studied by scientists, politicians and economists. Some researchers consider the impact of the COVID-19 epidemic on the labour market in the context of informatisation and note the importance of the active use of digital technologies and artificial intelligence in overcoming the crisis [1-3]. Another group of authors focuses on the relationship between the working time dynamics and labour productivity in the context of digitalisation [4]. However, there is an opinion that artificial intelligence cannot fully mitigate the consequences of the pandemic due to the lack of adequate data and limited implementation [5].

The work of Louis-Philippe Béland, Abel Brodeur and Taylor Wright is focused on the issues of increased risks among workers in the fields of healthcare, education, culture and sports due to active interaction with a lot of people and the need to compensate them in the form of wage increases [6].

It should be noted that most of the works on the issues under consideration are devoted to changes in working conditions and employment in the economy. As noted by Y. Lott and H. Chung, a more flexible work schedule and work at home lead to an increase in workload and require special regulation [7-9].

Gender issues figure large in studying the impact of the pandemic on the labour market. So, N. Sarrasanti, F. Kwabena Donkor, C. Santos, M. Tsagkari and C. Wannous analyse in detail the problems of women's adaptation to the new conditions of the pandemic. Many women were forced to become unemployed, since teaching and caring for children at home in the conditions of self-distancing and caring for elderly relatives significantly hampered the women's ability to perform their professional duties [10, 11].

The key problem of the research is to identify qualitatively new social and economic effects as a result of the emerging primary and cascading supply and demand shocks in the labour market in the context of Covid-19, which determines the novelty of this work.

As part of the research, a hypothesis to confirm the 'structural effects of wage differentiation' in the context of the Covid-19 pandemic, which consists in an increase in unemployment, primarily among low-skilled workers and an increase in the average wage of those remaining employed, was put forward. At the same time, the rate of reduction in working hours due to the reduction in the number of people employed in the economy overtakes the rate of reduction in the total wage bill.

## 2 Materials and methods

The research is aimed at identifying contemporary socio-economic effects in the context of a pandemic crisis to reveal the influence of the 'structural wage differentiation effects'.

Achieving this goal is associated with the need to address some issues, such as comparing unemployment, employment, wages, lost working time based on data from countries in which the 'structural wage differentiation effects' are most pronounced.

The research uses a graphical method to visualise the relationships in the labour market and demonstrate the quantitative characteristics of the manifestation of the 'structural wage differentiation effects'.

Based on a systematic and interdisciplinary approach, the socio-economic essence of the presented effects is comprehended. Comparative approach and statistical evaluation method were used in the analysis of indicators by countries. The statistical data of international organisations ILO, OECD and EU provided the empirical basis for the research.

### 3 Results

Before the pandemic, starting from the second half of the 20th century, in developed countries, there was an objective trend of reducing working hours in the production sector (from 23% to 61% over the past 50 years) due to redistribution from the manufacturing sector to the service sector [12]. At the same time, the reduction in labour costs in industry ensured the growth of labour productivity of workers, which made it possible to obtain the positive effects of such a pattern.

In the context of the pandemic, the overall reduction in working hours is not caused by an increase in production efficiency and a decrease in labour intensity but a decrease in the total number of people employed in the economy as a whole (Table 1).

**Table 1.** Labour market indicator dynamics during the pandemic in the world as a whole

Indicator	2020	2021 (as of Quarter 3)
World-wide labour hours loss, %	8.9	4.3
Lost working time in the number of jobs at a 40-hour work week, thou.	310,242.622	15,0901.8
Unemployment rate, %	6.5	6.3
Change in the number of those employed, thou. people	-11,4151.8	+99,881.8
Level of labour participation in the global economy, %	-	59.7

*Source:* Compiled by the authors based on data [13].

In the context of a pandemic, direct and cascading supply and demand shocks operate in the labour market, and rapid structural shifts accelerated by the synergy of circumstances take place. In 2020, the global GDP contraction rate was a record 3.6%. According to OECD economists, by the end of 2021, the total damage to the global economy due to the pandemic will make up \$7 trillion [14].

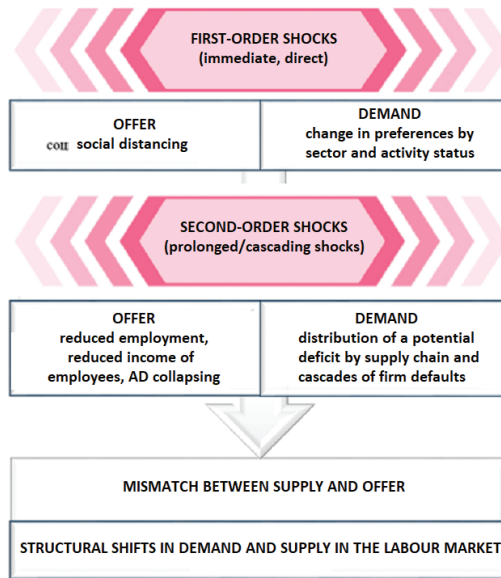
The impact of shocks on the labour market is shown in Figure 1. Structural shifts in supply and demand in the labour market are demonstrated in high unemployment in some industries and labour shortages in others. There was a sharp shortage of personnel among medical and pharmaceutical personnel, developers of financial services and cloud solutions, drivers, warehouse workers, and couriers. At the same time, there was a release of workers in tourism, restaurants, hotels. There is an overabundance of low-skilled labour due to rapidly growing high technology and replacement by automated systems.

As a result of supply and demand shocks, the following socio-economic effects have established in the labour market (Figure 2).

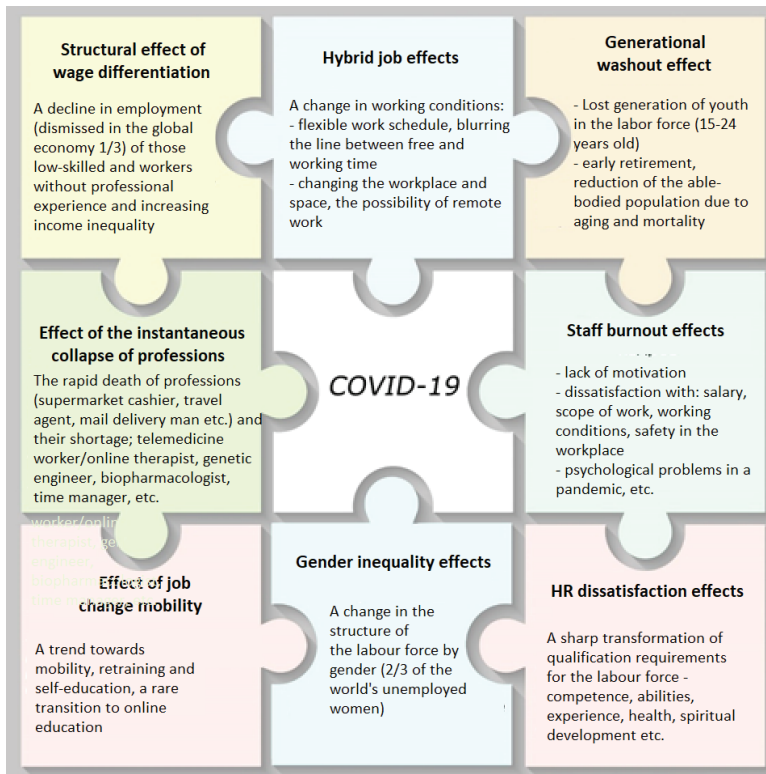
The considered effects in synergy increase the disproportions in the labour market; there are elements of a new economy, desocialised, sparsely populated and contactless. Let us analyse in more detail the 'structural effects of wage differentiation' which arises from the fact that the majority of those, who have lost their jobs, belong to low-paid professions, and how the average wage of the remaining workers changes as a result.

Despite huge efforts to protect employment and support enterprises undertaken in most countries of the world, unemployment was growing rapidly, incomes of economic actors were declining, and poverty was growing. The reduction in working hours during the pandemic also led to changes in the size of the wage fund and the real wages of workers. In order to preserve jobs in the spring of 2020, governments in many countries have taken measures to prohibit mass layoffs of workers. As a result, in industries, that have suspended their activities, wages for Quarter 1 of 2020 decreased among 35% of workers in the US, 30% in the UK and 20% in Germany. For the first half of 2020, the fall in wages in

Argentina was 25%, in Uruguay – 20%, in Ethiopia – 6%, in India – 3.6%, and in the informal sector – 22.6%. In Chile, the share of enterprises temporarily practicing wage cuts in order to save jobs was 8.4%, and in some industries, it exceeded 15% [15].



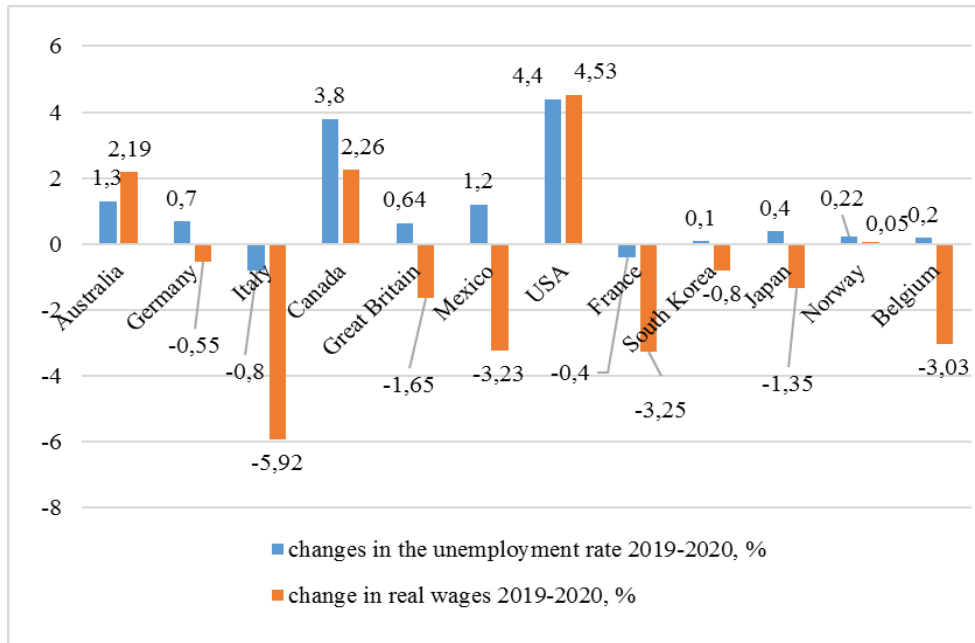
**Fig. 1.** Structural shifts in the labour market as a result of supply and demand shocks due to Covid-19. *Source:* Compiled by the authors.



**Fig. 2.** Socio-economic effects in the labour market as a result of supply and demand shocks due to Covid-19. *Source:* Compiled by the authors.

The reduction in the payroll during the pandemic is caused by the loss of jobs and reduced working hours. Due to mass layoffs in European countries, the wage bill has decreased, according to ILO estimates, by 11.4%. However, in countries, where timely decisions were made to preserve jobs and wage subsidy systems were introduced, it has been possible to compensate for the decline in the wage bill caused by the reduction in working hours and, accordingly, to contain the rate of decline in the total wage bill. Thus, in Croatia, Luxembourg, the Netherlands and Sweden, the wage bill decreased by 3%, while on average for European countries this figure is noticeably higher and reaches 10% [15].

Overall, two-thirds of countries have seen wage growth decline or slow since the start of the pandemic, with a slight increase or even decline in unemployment rates. However, in some countries, the average wage unexpectedly jumped in 2021, while the unemployment rate also rose significantly (Figure 3).



**Fig. 3.** Structural effects in the labour markets of some countries during the pandemic. *Source:* Calculated by the authors based on [13].

For example, in Australia, Canada and the USA, with a significant reduction in jobs, the average wage increased. Thus, in the United States, the employment rate in October 2021 increased by 2.44% compared to the beginning of the current year. More significant growth is recorded in Canada, and from January to October 2021, it amounted to +4.1% [13]. In countries, where the unemployment rate has decreased slightly or even decreased (for example, the UK, Italy, Mexico, South Korea, Japan, France, Belgium, Iceland and Chile), there is a sharp decline in average wages. In some EU countries, there is an increase in average real wages (in Hungary (+3.83%), Latvia (+4.3%), Lithuania (+7.12%)), with a slight increase in unemployment. These dynamics of the unemployment rate and the average wage can be explained by the 'structural wage differentiation effects' which consist in an increase in unemployment due to the reduction of low-paid jobs and an increase in the average wage of the remaining employed.

## 4 Discussion

The calculations showed that the pandemic, by raising the unemployment rate and reducing working hours, had a noticeable impact on the total wage bill. This refutes the conclusions of a number of researchers that COVID-19 did not have a significant impact on wages [6]. The hypothesis put forward earlier about a faster reduction in working hours compared to the decrease in the total wage fund was confirmed. In turn, this made it possible to substantiate the presence of a structural effect of wage differentiation in the economy. In further studies, the authors plan a detailed study of all the presented effects, also in conjunction with the state regulation system in the direction of their mitigation.

## 5 Conclusion

Based on the research results, it was possible to obtain a number of theoretical and practical results and conclusions.

1. A theoretical research identified primary and cascading shocks in the labour market and their consequences (social distancing, remote work, changing demand, declining employment, falling incomes, disruption of supply chains between firms and industries, a cascade of bankruptcies and shortages). These shocks have been proven to accelerate structural shifts in the labour market.

2. The socio-economic effects are identified, which in synergy lead to an increasing imbalance in the labour market, and the features of their manifestation in the context of overcoming the pandemic crisis are discovered.

3. The results of the empirical study confirmed the hypothesis of a faster decline in the pace of working hours compared to the reduction in the total wage bill in the context of the Covid-19 pandemic.

4. The conducted cross-country comparisons of unemployment rates and real wage growth rates confirmed that the structural wage differentiation effects arise as a result of rising unemployment among low-skilled people and an increase in the average wage growth rate among other workers. For most countries, where the unemployment rate has declined only slightly, there has been a sharp decline in average wages.

## References

1. X. Wang, Y. Li, T. Stafford, D. Xin, The IT labor market in pandemic conditions (2020). <http://dx.doi.org/10.2139/ssrn.3773981>
2. M. Dey, M.A. Loewenstein, *Monthly Labor Rev.*, 1-19 (April, 2020).
3. W. Naudé, *AI & Society* **35(1)**, 761-765 (2020). <https://doi.org/10.1007/s00146-020-00978-0>
4. A.V. Zolotov, T.N. Demicheva, M.V. Shilov M.V. Zolotova, I.P. Denisova, *Lect.Notes Networks Sys.*, **129**, 792-798 (2020). [https://doi.org/10.1007/978-3-030-47945-9\\_84](https://doi.org/10.1007/978-3-030-47945-9_84)
5. D. Coldeway, AI and big data won't work miracles in the fight against coronavirus. *Techcrunch* (2020). Accessed on: November 21, 2021. [Online]. Available: <https://techcrunch.com/2020/03/26/ai-and-big-data-wont-work-miracles-in-the-fight-against-coronavirus>
6. L.-P. Béland, A. Brodeur, T. Wright, The short-term economic consequences of Covid-19: Exposure to Disease, Remote Work and Government Response. *IZA Discussion Paper No. 13159* (2020). <http://dx.doi.org/10.2139/ssrn.3584922>
7. Y. Lott, *Soc. Indic. Res.*, **151**, 471-494 (2020). <https://doi.org/10.1007/s11205-018-2031-z>
8. H. Chung, T. van der Lippe, *Soc. Indic. Res.*, **151**, 365-381 (2020). <https://doi.org/10.1007/s11205-018-2025-x>
9. S. Greenstein, *IEEE Micro* **41(3)**, 110-112 (2021). <https://doi.org/10.1109/MM.2021.3073433>
10. N. Sarrasanti, F.K. Donkor, C. Santos, M. Tsagkari, C. Wannous, *IEEE Eng. Manag. Rev.*, **48(4)**, 37-45 (2020). <https://doi.org/10.1109/EMR.2020.3031313>
11. The inequality virus. Accessed on: November 20, 2021. [Online]. Available: <https://oxfamilibrary.openrepository.com/bitstream/handle/10546/621149/bp-the-inequality-virus-250121-en.pdf> or <https://doi.org/10.21201/2021.6409>

12. E.V. Lyadova, I.N. Polushkina, N.A. Udalova, *Bul. Belgorod Univ. Cooper., Econ. Law*, **5(84)**, 163-173 (2020). <https://doi.org/10.21295/2223-5639-2020-5-163-173>
13. International Labour Organization. Accessed on: November 15, 2021. [Online]. Available: <https://ilostat.ilo.org>
14. Official website OECD. Accessed on: November 15, 2021. Accessed on: November 16, 2021. [Online]. Available: <https://stats.oecd.org>
15. Global Wage Report 2020-21. Wages and minimum wages in the time of COVID-19 (2021). Accessed on: November 15, 2021. [Online]. Available: [https://www.ilo.org/global/publications/books/WCMS\\_762534/lang--en/index.htm](https://www.ilo.org/global/publications/books/WCMS_762534/lang--en/index.htm)