

# How Can Digital Sharing Economy Reduce Unemployment?

*Iveta Fodranová<sup>1\*</sup>, Mária Antalová<sup>2</sup>*

**Abstract:** The primary prerequisite for the development of a collaborative economy is the rapid growth of information technologies. A new way of communication, together with online platforms, created Internet marketplaces, which enabled the meeting of supply and demand in the virtual space. However, such a conversion of the economy is necessarily accompanied by extensive transformations on the labor market. We investigated the impact of digitalization on the labor market via the correlation between Internet users and unemployment on the European market. Based on data set we identified statistically significant effects. However, the value of the correlation coefficient could be increased not only by accelerating digitalization but also by investing in overcoming the language barrier in a multicultural Europe.

**Keywords:** Digitalization, labour market, collaborative economy, unemployment rate, internet user

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## Introduction

While in the past the labor market was determined mainly by demographic development, now the decisive driver of its further development can be clearly considered digitalization and deployment of fourth industrial revolution technologies, which fundamentally not only affect the performance of organizations but change traditional ways and processes that allow involvement in the work process. The COVID pandemic has had a major impact on structural changes in the economy, which have been under way for a long time. It is primarily a matter of digitizing the economy, which is significantly accelerating structural changes on the labor market. These processes will clearly accelerate the transition of traditional economies to a collaborative type of economy based on the intelligent use of digital data through which value is created. It is data and data processing capacities that are considered to be a key competitive advantage (United Nations, 2019), as changes in the current economy are no longer based on industrialization, but on platforms that affect society, markets and companies. It is clear that software platforms have improved the productivity and contributed to innovation in many industries and the creation of new enterprises. On the other hand, they disrupted or destroyed other enterprises that were not prepared for such a change. One of the results of this process is a sharp change in the demand for workforce.

In addition to an extensive literature review, 40 interviews were conducted for this study. The goal of conducting interviews was to find out how students looked at the use of smartphones in the classroom (Monib & Amr, 2020).

## Digitalization as a driver of collaborative economy

The sharp change in public attitudes towards consumption has been reflected in the growing interest in climate change issues and the need for permanent participation in economic, cultural and social life. This process became more pronounced during the economic recession, when in 2008, together with the financial crisis, the rate of registered

and real unemployment increased and consumers, whose financial situation did not allow them to buy new consumer goods, began to consider alternative market relations. Lending goods and services through modern Internet technologies, which evoked the emergence of a new, virtual market based on the trust and recommendations of market participants, proved to be an ideal option. Such a way of providing cost-effective, temporary access to products or services without the need to own the means of production has become so popular that there has been talk of the phenomenon of a sharing economy.

The theoretical basis for a collaborative economy is the existence of many concepts and definitions that intersect across the observed issues. However, the absence of uniform terminology to describe an economic model responsive to population growth, urbanization, resource constraints and high technology growth by prioritizing access to ownership leads to the use of a number of terms to describe it, such as collaborative economy, sharing economy, gig economy, digital economy, peer-to-peer economy, platform economy. The primary prerequisite for the development of a collaborative economy is the rapid growth of information technologies (web 2.0), which has enabled, in addition to passive reception of information, also active participation in the creation of site content through social media. A new way of communication, together with online platforms, created Internet marketplaces, which enabled the meeting of supply and demand in the virtual space. However, such a conversion of the economy is necessarily accompanied by extensive transformations on the labor market.

One of the main engines of technological changes that lead to significant changes on the labor market is digitalization (Gridneva, 2019). According to European Economic and Social Committee (2017), the digitalization of the economy or the fourth industrial revolution has serious consequences for job creation (new industries, new products, new services) and, on the other hand, for job destruction (robotization, automatization). According to Degryse (2016), "new technologies can really bring about a radical change in the economy, create jobs, but also unemployment in less or moderately skilled

<sup>1</sup>Department of Service and Tourism, Faculty of Commerce, Economic University in Bratislava, Slovak Republic

<sup>2</sup>Department of Social Development and Labour, Faculty of National Economy, Economic University in Bratislava Slovak Republic

\*Corresponding author: iveta.fodranova@euba.sk

occupations, which can be replaced by algorithms and robots.” However, it should be emphasized that it is a natural feature of any development in every sphere of development to create new opportunities and eliminate old ones. In the same way, new technologies create new jobs (and within them they also create new requirements for the structure and qualification of the workforce). However, the benefit of current technologies is the unprecedented acquisition of information about new jobs and requirements for their filling thanks to seamless public access to information: “one of the main impacts of digitalization is growing flexibility via Internet access which influences how workers and employers interact and communicate with each other. The extension of information and communication technologies to economic activity is changing the labor market in an important way.

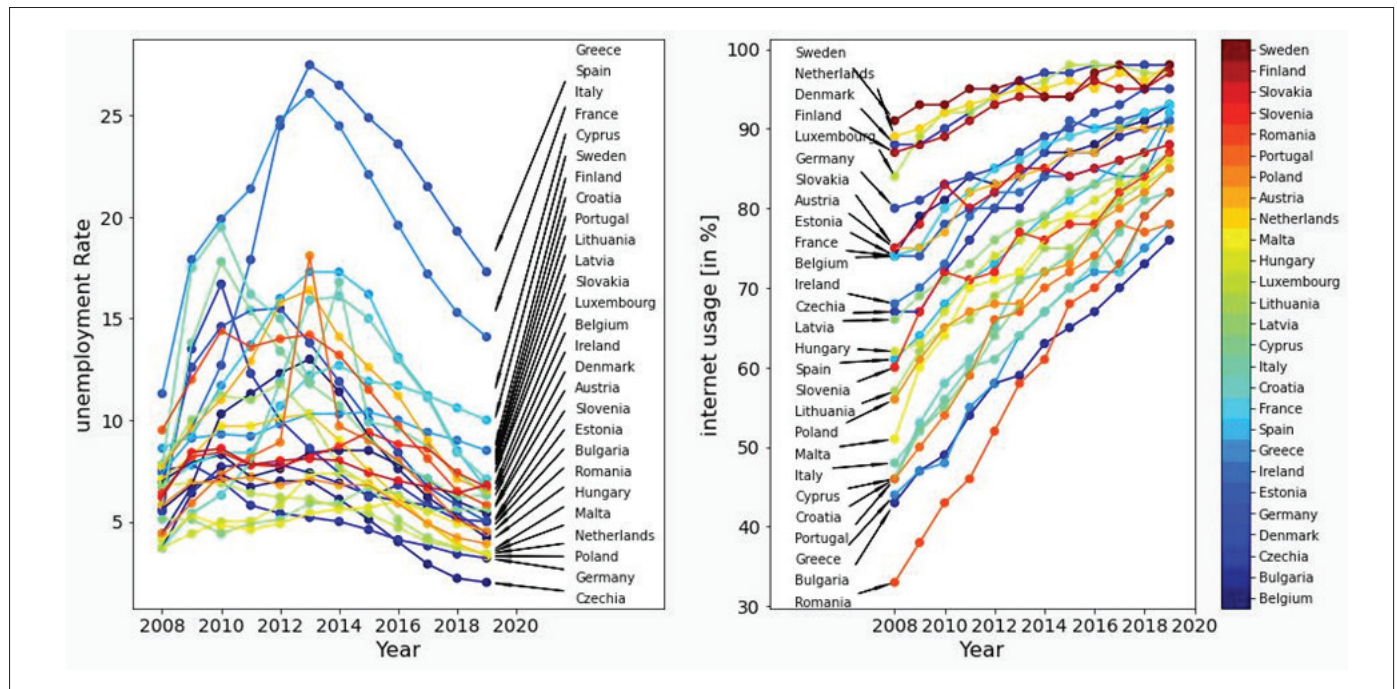
Among them, Internet job platforms are providing new ways to match demand and supply for labor services. Over the last few years, Internet platforms have emerged as major actors in the digital economy, providing digital marketplaces for information, goods and services. Among them, Internet job platforms are providing new ways

to match demand and supply for labor services. From this aspect, the digitalization is a key point not only for the point with unemployment but also for the smooth transition to a collaborative type of economy based on the intelligent use of digital data. In the context of this issue, the aim of our research was to estimate the impact of digitalization on the labor market via the correlation between Internet users and unemployment on the European market.

**Methods**

We used official Eurostat statistics for percentage of the internet users aged 16 to 74 and the unemployment rate from 2008 to 2019 from 27 European union countries. An unemployed person is defined by Eurostat, according to the guidelines of the International Labour Organization (OECD, 2018), as: (1) someone aged 15 to 74 (in Italy, Spain, the United Kingdom, Iceland, Norway: 16 to 74 years); (2) without work during the reference week; (3) available to start work within the next two weeks (or has already found a job to start within the next three months); (4) actively having sought employment at some time during the last four weeks.

**Figure 1:** Rate of unemployment and Internet used by individuals in % (Author, 2021)



The employment rate is the percentage of employed persons in relation to the comparable total population. For the overall employment rate, the comparison is made with the population of working-age; but employment rates can also be calculated for a particular age group and/or gender in a specific geographical area (for example the males of age 15-24 employed versus total in one European Union (EU) Member State (Eurostat, 2021).

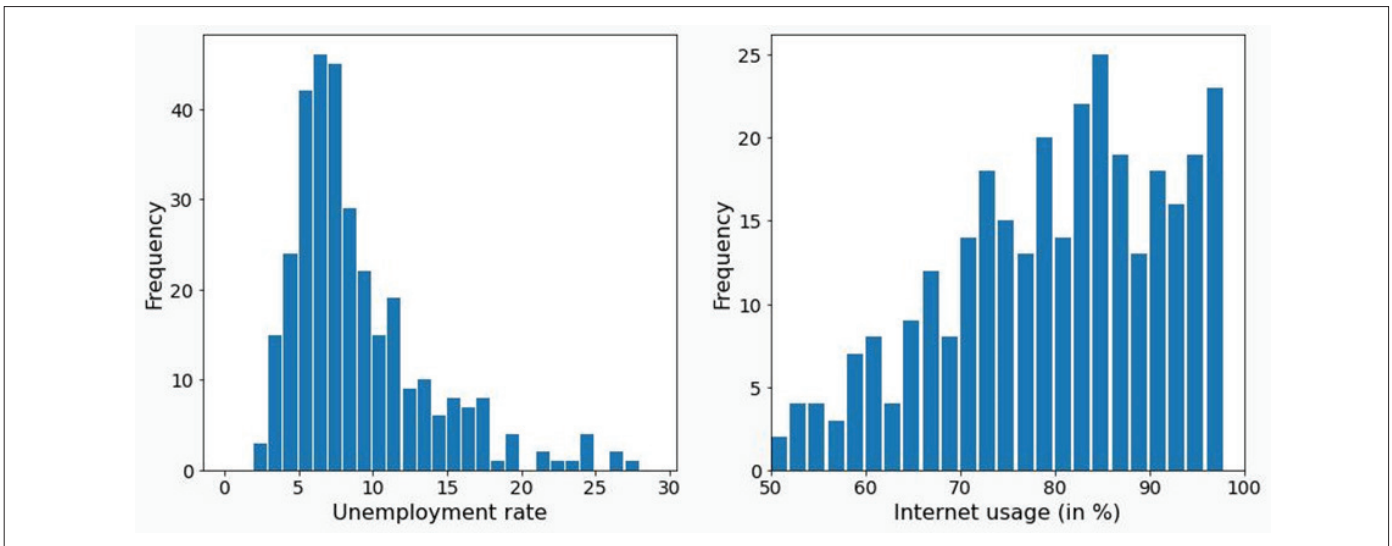
Internet users are defined as persons who accessed the Internet in the last 12 months from any device, including mobile phones. Percentage is the percentage of a country’s population that are Internet users. Estimates are derived either from household surveys or from Internet subscription data Key ICT indicators for developed and developing countries and the world (totals and percentage rates), International Telecommunication Union (OECD iLibrary, 2021).

**Table 1.** Descriptive Statistics

	Internet used by individuals	Unemployed rate
Mean	78,2346	9,0383
Median	80	7,7
Mode	84,00a	6,80a
Skewness	-0,725	1,524
Std. Error of Skewness	0,135	0,135
Kurtosis	0,077	2,487
Std. Error of Kurtosis	0,27	0,27
Sum	25348	2928,4

Note. N=324

**Figure 2:** Histogram of data set (Author, 2021)



The properties and the basic statistics of the data distribution were determined by the SPSS software and are shown in Tab.1. The distributions are plotted on Fig.2. The median of the distribution Internet used by individuals is greater than the mean on. The difference means that the data are “skewed to the left”, with a long tail of low scores pulling the mean down more than the median. The distribution Internet used by individuals exhibits very low kurtosis

(0.077) almost as a normal distribution. The median of the variable Unemployed rate is smaller than the mean, what means that the data are “skewed to the right”. The value kurtosis (2.487) is very high in comparison to kurtosis of the normal distribution (0). The properties of both distributions are implying that the data are not normally distributed. To quantitatively test the normality of the distributions we used Kolmogorov-Smirnov and Shapiro-Wilk tests.

**Table 2.** Test of normality

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Internet used by individuals	0,088	324	0	0,953	324	0
Unemployed rate	0,155	324	0	0,867	324	0

A Kolmogorov-Smirnov test indicates that the distribution Internet used by individual do not follow a normal distribution,  $D(324) = 0$ ,  $p = 0.005$ . A Kolmogorov-Smirnov test indicates also that the distribution Unemployment rate do not follow a normal distribution,  $D(324) = 0$ ,  $p = 0.005$ .

Because the data do not follow the normal distribution. we used nonparametric methods of detecting associations between two variables: Kendall’s Tau coefficient ( $\tau_b$ ) and Spearman’s rank correlation coefficient.

## Results

The results are presented in Table 3, in a matrix format such that, the correlations are replicated. The table presents Kendall's tau-b correlation, its significance value, and the sample size.

**Table 3** Kendall's and Spearman's correlation

			Internet used by individuals in %	Unemployed rate %
<b>Kendall's tau b</b>	Internet used by individuals in %	Correlation Coefficient	1	-,268**
		Sig. (2-tailed)	0	0
		N	324	324
	Unemployed rate	Correlation Coefficient		1
		Sig. (2-tailed)	0	0
		N	324	324
<b>Spearman's rho</b>	Internet used by individuals in %	Correlation Coefficient	1	-,402**
		Sig. (2-tailed)	0	0
		N	324	324
	Unemployed rate	Correlation Coefficient	-,402**	1
		Sig. (2-tailed)	0	0
		N	324	324

\*\*Correlation is significant at the 0,05 level (2-tailed).

We can see that Kendall's tau-b correlation coefficient ( $\tau_b$ ) is -0.268 which according to Table 4 and Table 5 is implying weak negative relationship. The guidelines in Table 4 are generally in agreement with Cohen's (Cohen, 1988) recommended guidelines in Table 5. The p-value was lower than 0 which means that the correlation is statistically significant. Similar result was obtained with the Spearman's correlation. The correlation coefficient was -0.402 with p-value below 0.05. In this case, the data are moderately correlated.

According to Newton & Rudestam, (1999) for many studies involving sociological, educational, and psychological data, the following guidelines are appropriate (Newton & Rudestam, 1999).

**Table 4.** Interpretation of Linear Relationship

r-value	Interpretation of Linear Relationship
0.8	Strong positive
0.5	Moderate positive
0.2	Weak positive
0.0	No relationship
-0.2	Weak negative
-0.5	Moderate negative
-0.8	Strong negative

**Table 5.** Cohen's recommended guidelines for interpreting of Linear Relationship (Cohen, 1988)

Strength of Associative	Coefficient	
	Positive	Negative
Small	.1 to .3	-0,1 to -0,3
Medium	.3 to .5	-0,3 to -0,5
Large	.5 to 1.0	-0,5 to -1,0

We investigated the impact of digitalization and collaborative economy on the labor market via the correlation between Internet users and unemployment on the European market (Table 3). A Kendall's tau-b correlation was run to determine the relationship between internet used by individuals in % and unemployed rate. Based on data set we provided evidence that significant effect Kendall tau ( $\tau_b$ ), the value of which was -0.268,  $p=0$  at the level of statistical significance  $\alpha = 0.05$ ; which indicates the upper value of a small linear negative dependence, i.e. increasing the possibility of access to the Internet decreases the unemployment rate. A significant association between internet used by individuals by calculating Spearman's rank correlation coefficient ( $r_s$ ) is indicated by the value -0,403 which indicates moderate negative associative. However, the value of Spearman's rho is significantly higher -0.402,  $p=0$  and because the data set does not contain extreme values, we can consider it as a reliable data of the measured dependence, which represents the mean dependence.

Despite the measured values, we assumed the measurement of a higher value of the dependence. Today, online job portals are used to look for work, which publish the offers of companies from various industries in one place. All you have to do is monitor these portals regularly, know how to filter suitable offers and respond correctly to the selected advertisement. Searching for jobs via the Internet offers several advantages: (1) speed; (2) filtering, keyword usage; (2): temporal independence; (3) timeliness; (4) exclusivity; (5) information space. These parameters seem to be sufficient for job-seekers to find a job offer that suits them. However, the language barrier can be a problem. Europe has a significant number of migrants. As stated by UNHCR (2017) "In 2017, continental Europe hosted 2.6 million refugees and nearly 1 million asylum-seekers. Eurostat estimates 16.9 million

European Union (EU) citizens live in another EU country, and the number of non-EU citizens in the EU at 21.6 million, with the number of foreign permanent residents varying greatly from one country to the other.” Respondents reporting a language other than English as their first language at home provide information on whether they have experienced any difficulties in finding or keeping a job (Reino, 2020). “This large group of people needs a job on the labor market and has access to the Internet, but rather than looking for jobs, they use it to communicate on social networks due to the language barrier. “Similarly, social media platforms have been widely used among migrants in order to maintain contacts with family members and friends in their country of origin (Elias & Lemish, 2009; Komito, 2011; Sawyer & Chen, 2012). However, fewer than half of refugee participants mentioned that they use social media for acquiring information about employment (Alencar, 2018). Limited language ability has been associated with lower wage earnings for migrants (Zhen, 2013; Batalova & Fix, 2014). Studies in crisis communication have shown that not all segments of society understand official languages of countries in spoken and/or written forms (Lha, 2020; O’Brien and Cadwell, 2018). These factors thus realistically reduce the effectiveness of the effects of platforms aimed at eliminating unemployment through job portals.

## Discussion

In the 1990s most discussion of the Internet and IT focused on the dot.coms and e-commerce, with little attention given to the fact that the Internet and IT technologies were changing the labor market and labor organization. Even in 2014, Kuhn (2014) stated that „Until recently there has been little evidence that any Internet-based tool has had a measurable effect on job search or recruitment outcomes. From this point of view, the Internet and IT technologies have proven to be a disruptive process innovation, resulting in drastically changing labor markets.

Software platforms in the function of information intermediaries have thus greatly contributed to changes on the labor market. „New forms of work in the platform economy, and increased rates of self-employment, may represent greater flexibility and lower entry barriers for people with disabilities seeking employment. The Internet is progressively becoming the critical infrastructure of the economy (European Economic and Social Committee, 2017). Internet job boards are a rich source of information on the number and characteristics both of vacant jobs and of those looking for jobs, and sometimes the results of the matching process between searchers and jobs (Kuhn, 2014). The cost of looking for work and recruiting workers online is very low compared with traditional job search and recruiting methods (Kuhn, 2014). Internet job search and recruitment offers three potential efficiency gains to the economy: reduced transactions costs; speedier clearing of the job market; and better matching between workers and vacancies (Freeman, 2002). Digitalization is thus fundamentally changing markets, not only in the number of available jobs, but also in the process of acquiring job positions (Raj-Reichert et al., 2021; Vasilescu et al., 2020). Digitalization is drastically changing labor markets and some studies (Xanthidis & Nikolaidis, 2015; Knights & Latham, 2019) suggest that people with disabilities could be primary beneficiaries. Location and mobility are less relevant. For

people with disabilities, technology makes things easier. Although many traditional jobs are being lost and digital competence requirements are increasing, new forms of work, such as online work from home, platform work, will bring people with disabilities to the work process, for whom daily arrival at work has been an insurmountable obstacle. On the other hand, when looking for a job, there was a significant barrier in the form of insufficient language skills, especially in the group of migrants, which hinders online communication with a potential employer.

The development of digital infrastructure is a key precondition to a deeper integration of digital technologies. Technological progress is not the only factor that has recently reshaped Europe’s labor markets. The COVID pandemic, the impacts of collaborative economy, globalization, demographic developments, and climate change are factors that fundamentally determine labor market developments. People will have to deal with changing working conditions more often, which presupposes a retreat from a lifelong working career with only one employer. The labor market reflects the dynamics of the existence of companies in the macro environment, which will have to face fundamental changes in the macro environment in which companies exist. In the context of the expected changes, states should therefore strengthen the building of the digital economy, while increasing public spending on education. However, despite calls from the European institutions to prioritize public spending to support the growth of education, there is evidence that savings are being made at the expense of investment in education. However, if the education and skills of the workforce are not in line with digital skills requirements, the problems and obstacles related to job mobility, which will return to economies in the form of rising long-term unemployment, will also be exacerbated.

## Conflict of Interest Statement

The authors declare that there is no conflict of interest.

## References

- Alencar, A. (2018). Refugee integration and social media: a local and experiential perspective, *Information, Communication & Society*, 21:11, 1588-1603, DOI: 10.1080/1369118X.2017.1340500. <https://doi.org/10.1080/1369118X.2017.1340500>
- Batalova, J. & Fix, M. (2014). *What does PIAAC tell us about the skills and competencies of immigrant adults in the United States?* Retrieved from the PIAAC Gateway website: [http://static1.squarespace.com/static/51bb74b8e4b0139570ddf020/t/54da7824e4b026d7c8ca7c/1423603748680/Batalova\\_Fix\\_PIAAC.pdf](http://static1.squarespace.com/static/51bb74b8e4b0139570ddf020/t/54da7824e4b026d7c8ca7c/1423603748680/Batalova_Fix_PIAAC.pdf) 4.
- Cohen J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Hillsdale, NJ, Lawrence Erlbaum, 1988.
- Degryse, Ch. (2016). Digitalisation of the Economy and its Impact on Labour Markets (February 10, 2016). *ETUI Research Paper - Working Paper 2016.02*, Available at SSRN: <https://ssrn.com/abstract=2730550> or <http://dx.doi.org/10.2139/ssrn.2730550>. <https://doi.org/10.2139/ssrn.2730550>.

- Elias, N. & Lemish, D. (2009). Spinning the web of identity: the roles of the internet in the lives of immigrant adolescents. Volume: 11 issue: 4, page(s): 533-551. <https://doi.org/10.1177/1461444809102959>
- European Economic and Social Committee, (2017). *Impact of digitalization and the on-demand economy on labour markets and the consequences for employment and industrial relations*.
- Eurostat (2021). *Statistics explained*. [https://ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment\\_statistics](https://ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment_statistics).
- Freeman, R. B. (2002). The labour market in the new information economy. *Working paper 9254* <http://www.nber.org/papers/w9254> National bureau of economic research 1050 Massachusetts avenue, Cambridge, MA 02138 october 2002. Retrieved from [https://www.nber.org/system/files/working\\_papers/w9254/w9254.pdf](https://www.nber.org/system/files/working_papers/w9254/w9254.pdf)
- George, D. & Mallery, P. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference*, 17.0 update (10a ed.) Boston: Pearson.
- Gridneva, B. (2019). Unemployment in the Conditions of Digitization of the Regional Economy. *Scientific Research and Development. Economics*. 7. 24-27. [10.12737/article\\_5d53b39979e199.11490453](https://doi.org/10.12737/article_5d53b39979e199.11490453). [https://doi.org/10.12737/article\\_5d53b39979e199.11490453](https://doi.org/10.12737/article_5d53b39979e199.11490453)
- Kenney, M. & Zysman, J. (2016). Rise of the Platform Economy. *Issues in science and technology*. Vol. XXXII, No. 3, Spring. <https://issues.org/the-rise-of-the-platform-economy/>.
- Knights, D. & Latham, Y. (2019). Disabled People and Digitalization: Disruptive documents in distributing digital devices. *Organization Studies*. Volume: 41 issue: 6, page(s): 855-872.
- Komito, L. (2011). *Social Media and Migration: Virtual Community* 2.0. JASIST. 62. 1075-1086. [10.1002/asi.21517](https://doi.org/10.1002/asi.21517). <https://doi.org/10.1002/asi.21517>
- Kuhn, P. & Mansour, H. (2014). Is Internet Job Search Still Ineffective? *The Economic Journal*, Vol. 124, Issue 581, 1213-1233. <https://doi.org/10.1111/econj.12119>
- Lha, Y. (2020). Fighting the coronavirus in local languages. *Language on the Move*. <https://www.languageonthemove.com/fighting-the-coronavirus-in-local-languages/> (accessed 7 July 2020). Search in Google Scholar 2020;
- Eurostat, (2019). *Migration and migrant population statistics - Statistics Explained*. [https://ec.europa.eu/eurostat/statistics-explained/index.php/Migration\\_and\\_migrant\\_population\\_statistics](https://ec.europa.eu/eurostat/statistics-explained/index.php/Migration_and_migrant_population_statistics)
- Newton, R. R, Rudestam, K. E. (1999): Your Statistical Consultant. Thousand Oaks, CA, Sage
- O'Brien, S. & Cadwell, P. (2018). Translation facilitates comprehension of health-related crisis information: Kenya as an example. *Journal of Specialized Translation* (28). 23-51.
- OECD, (2018). *Education at a Glance*. OECD iLibrary. Retrieved from [https://www.oecd-ilibrary.org/education/education-at-a-glance-2018\\_eag-2018-en](https://www.oecd-ilibrary.org/education/education-at-a-glance-2018_eag-2018-en)
- OECD (2018). *OECD Reviews of Digital Transformation: Going Digital in Sweden*. OECD Publishing, Paris, <https://doi.org/10.1787/9789264302259-7-en>
- OECD iLibrary (2021). [https://www.oecd-ilibrary.org/docserver/sti\\_scoreboard-2015-50-en.pdf?expires=1618211675&id=id&accname=guest&checksum=8A385BAF3ED51E9C0B7756E50DEADF35](https://www.oecd-ilibrary.org/docserver/sti_scoreboard-2015-50-en.pdf?expires=1618211675&id=id&accname=guest&checksum=8A385BAF3ED51E9C0B7756E50DEADF35)
- Raj-Reichert, G., Zajak, S., Helmerich, N. (2020). Introduction to special issue on digitalization, labour and global production. *Competition & Change Volume 25* Number 2021 <https://doi.org/10.1177/1024529420914478>
- Reino, M. F. (2020). *English language use and proficiency of migrants in the UK*. <https://migrationobservatory.ox.ac.uk/wp-content/uploads/2019/07/Briefing-English-language-use-and-proficiency-1.pdf>
- Sawyer, R. & Chen, G. M. (2012). The impact of Social Media on International Adaptation. *Intercultural Communication Studies*, vol.21, no.2, 2012, pp.151-169. Retrieved from <https://web.uri.edu/iaics/files/09RebeccaSawyerGuoMingChen.pdf>
- The migrant observatory (2019). *English language use and proficiency of migrants in the UK* <https://migrationobservatory.ox.ac.uk/resources/briefings/english-language-use-and-proficiency-of-migrants-in-the-uk/>
- UNHCR (2017). *Global trends forced displacement in 2017*. Geneva. <https://www.unhcr.org/globaltrends2017/>
- Vasilescu, M. D., Serban, A. C., Dimian, G. C., Aceleanu, M. I., Picatoste, X. (2020). Digital divide, skills and perceptions on digitalisation in the European Union-Towards a smart labour market. *PLoS ONE* 15(4): e0232032. <https://doi.org/10.1371/journal.pone.0232032><https://doi.org/10.1371/journal.pone.0232032>
- Xanthidis, D. & Nikolaidis, P. (2015). *People with disabilities in the digital era: a basic review of the policies and the technologies*.
- Zhen, Y. (2013). The effects of English proficiency on earnings of U.S. foreign-born immigrants: Does gender matter? *Journal of Finance & Economics*, 1(1), 27-41. doi:10.12735<https://doi.org/10.12735/jfe.v1i1p27>

