

EXPLORING ECONOMIC EFFECTS OF WORK OUT OF COMPANY OFFICE BASED ON BIBLIOMETRIC ANALYSIS

Monica Aureliana PETCU , Irina Daniela CIȘMAȘU *

*Department of Financial and Economic Analysis and Valuation,
Bucharest University of Economic Studies, Bucharest, Romania*

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Abstract. Increasing the incidence of work out of company office (WOCO) by transforming it from a more limited and circumstantial practice into a predominant work option requires a special attention of social partners and political decision-makers in order to harmonize economic and social performances. The aim of this research is to evaluate the effects of WOCO from the economic perspective – resources allocation and performance, developing the previous studies through the approach of the broad area of WOCO, extending the analysis at the microeconomic and macroeconomic level, in order to harmonize the objectives of sustainable economic growth. Using bibliometric techniques, the 289 scientific publications from the Web of Science platform were analysed, highlighting the conceptual and intellectual structure of the research, in the field. The research themes related to economic topic consist of: the degree of employment, technology and digital infrastructure development, economic performance and productivity, and carrying out economic activities from the perspective of WOCO. The results of this broad-spectrum research reveal a holistic view of the network, constituting a relevant reference to develop a comprehensive understanding of the impact of WOCO, useful to researchers, managers, and regulatory bodies, and identifying the potential research gaps and future research direction.

Keywords: telework, remote work, work from home, economic, remote job, bibliometric analysis.

JEL Classification: M54, E24, L20.

Introduction

In recent years, technological progress, as the main cause, digitalization of the human resources processes as well as the COVID-19 pandemic have generated a significant increase in WOCO and in research in this field. The management of corporate performance implies a constructive management of human resources, as capital that ensures the effective and creative valorization of all other resources. Under the conditions of rapid

*Corresponding author. E-mail: irina.cismasu@cig.ase.ro

and complex changes in the environment in which they operate, companies operationalize structural contingency theory, seeking to optimize their structure by individualizing based on specific factors. A form of efficiency from the perspective of this theory is the implementation of WOCO, changing work patterns in space and time.

Scholars' interest in researching the literature on WOCO has materialized in bibliometric analyses, which through their synthetic character allow the identification of knowledge structures. Considering how work is organized, bibliometric analyzes focused on remote work (Arunprasad et al., 2022; Mirakyan & Berezka, 2022), or teleworking (Herrera et al., 2022), or work-for-home (Dogra & Parrey, 2022). One of the themes addressed primarily in the bibliometric analyzes concerned management, identifying as relevant factors: orientation towards technology, leadership, HRM practices, external processes and organizational culture (Arunprasad et al., 2022); decision making, communication, conflict, organizational culture, leadership and motivation (Mirakyan & Berezka, 2022). Herrera et al. (2022) analysed the worker–employer–family conflict, work–life balance and flexibility policies in the context of telework. Dogra and Parrey (2022) identified ten areas of interest in the case of work-from-home: leadership, mental health, technology, crisis management, gender, challenges, well-being and work-life balance.

The identified gaps in previous studies consist in limiting the research to one or another form of work out of company office, not including the broad area of WOCO. Furthermore, the most existing current research insufficiently covers its economic perspective, addressing managerial issues at the corporate level, or synthesizes cumulative complex aspects, of a social, economic and health nature. Also, the interest at the macroeconomic level for this form of work is not delimited.

With reference to these considerations, this study introduces the term of WOCO and analyzes the relevance of WOCO from the economic perspective. The proposed objectives of research are addressed by formulating three research questions (RQ): (1) what is the current status of research on the economic effects of WOCO? (2) what are the main themes and research areas on the economic effects of WOCO and (3) what are the potential research gaps and future research direction for WOCO?

The results of the study are of interest to scholars, by identifying the issue of WOCO and its economic effects in order to establish the causes and effects generated, the proposal of future research directions, to managers to increase labor productivity, reduce expenses, make human resource management more efficient, and to policy makers to ensure the legislative framework necessary to ensure the optimization of economic performance objectives with those of social protection, maintaining employability, reducing environmental protection costs, fair bearing by employer and employee of WOCO related expenses.

The rest of the paper is structured as follows. The next section addresses the concept of WOCO, followed by the second part which presents the materials and methods. In the third part we unveil and discuss the results, finally discussing them, drawing conclusions and highlighting limitations, and future research directions.

1. Literature review

1.1. The concept of WOCO

“Telework”, “remote work”, “work from home”, “remote job”, “distance work” and “mobile work” represent sintagms that circumscribe alternative work arrangement, out of company office.

The elements that must be considered in the definition of telework aim at: technology, location, contractual arrangements and time (Haddon & Brynin, 2005). “Technology is a crucial element in the distinction between telework and other forms of decentralized work” (Sullivan, 2003, p. 159). The use of information technology is necessary both in the execution of work tasks and to keep in touch with the team, management and those outside the organization. Telework involves a variety of locations, with an emphasis on remoteness, considering as an essential condition working away from the main place of work (Gareis, 2002). From the point of view of contractual arrangements, telework includes both self-employed and employees (Sullivan, 2003; Gareis, 2002). According to the intensity related to time, telework can be performed supplementary, alternating and permanent (Gareis, 2002). The research published by Santana and Cobo (2020) represents a scientific mapping analysis of future of work (FOW), using bibliographic networks, for the period 1998–2019, and identifies telework as an emerging theme in the period 1998–2008 and a motor theme in the periods 2009–2014 and 2015–2019.

Remote work eliminates in-person communication, referring “to organizational work that is performed outside of the normal organizational confines of space and time” (Olson, 1983, p. 182). Remote working is a flexible working arrangement imposed both for technical advances and for cultural changes (Hunter, 2019).

Concerning work from home, Yang et al. (2023) distinguish between working at home during working hours and working at home after working hours as an extension of the activities carried out at work. As a result of the significant increase in the use of WOCO during the COVID-19 pandemic, this distinction based on the use of work time has faded.

Telecommuting is an alternative to the term such as “telework”, “remote work”, and “distance work” (Gupta et al., 1995). Assessing employees’ telecommuting status consider the capability to perform tasks while working from remote locations such as home during regular office hours, satellite offices/telework centers (Gajendran et al., 2015).

Mobile work is defined as “work requiring physical movement from one place to another and/or temporary activity outside a fixed workplace” (Yuan et al., 2010, p. 125). The concept of mobile work is associated with mobility, but also with the use of mobile devices in activity, with the aim of achieving communication and collaboration, especially as a result of the territorial dispersion of workplaces (Stephens, 2023).

In their study on labor productivity when using WOCO, Choudhury et al. (2021) define the concept of work-from-anywhere as “an emerging form of remote work, where workers are awarded geographic flexibility, that is, the flexibility to choose where to live” (Choudhury et al., 2021, p. 655).

The literature, as well as the practice on the labor market, have constantly developed this form of materialization of the employee-employer relationship, which has also generated the

diversification of the terminology used. In the present study, we consider all the previously valences and we generically use the term “work outside the company office”.

1.2. Economic perspective of WOCO in literature

The most relevant and most cited five articles on WOS in the field of WOCO and its economic effects are presented.

Aleem et al. (2023), considering the effects generated by the COVID-19 pandemic, identified eight research themes: effect on employees at a personal level; effect on employees' careers; family life and gender roles; health, wellbeing, and safety; labor market dynamics; economic implications; remote work management; organizational remote work strategies. The social distancing measures imposed during the COVID-19 pandemic had a significant impact on labor markets, both in developed and emerging economies. Telework and ICI-based mobile work require the development of digital skills in order to ensure the resilience of labor markets during the pandemic and post-pandemic period (Zamfir & Aldea, 2020). Remote work during the pandemic involves specific structural conditions, respectively digital infrastructure as well as the structure of the economy, which may generate an unequal distribution of remote work and may influence the relationship between informality and remote work opportunities. Remote work preferences depend on the technology used, as well as on the sociodemographic and occupational attributes. Cultural aspects can constitute factors of resistance to the adoption of remote work (Schulz et al., 2023). The heterogeneity of the jobs (in standard premises, telework, home-based work, work performed in special facility, in open air facilities or transportation/delivery service) implies different employment and working conditions, work safety and working time commuting, potentially contributing to social stratification, influencing the distribution of economic benefits, generating health risks and, therefore, constituting a source of inequality on the labor market (Monusova, 2021). Neoliberal approach to the practice adopted by political decision-makers through the absence of legislation to regulate telework, leaves available to employers the discretionary stability of telework schemes and working conditions at home, losing itself from the contribution as an economic, social and environmental tool of sustainability (Hynes, 2014).

WOCO has a significant economic impact on work and labor market. The social distancing restrictions imposed during the COVID-19 period have generated new concerns regarding the work organization. Dingel and Neiman (2020) classified the feasibility of working at home for all occupations and combined this classification with the number of occupational employment, finding differences in the share of jobs that can be performed entirely at home, with significant variations between cities, industries, and countries. A lower share of jobs that can be done at home is observed in economies with lower incomes. In addition, wages related to these jobs are higher.

Belzunegui-Eraso and Erro-Garcés (2020) approached telework during the COVID-19 pandemic from the perspective of a safety practice adopted by companies, as well as by state institutions, to ensure the continuity of current activities protecting the health of employment. The study concludes with a challenge to deepen research on telework in the post-pandemic period, to determine whether the health crisis ensured the generalization of the

use of telework or was only a temporary solution, without continuing in the long term.

del Rio-Chanona et al. (2020) analyzed the supply and demand shock for the economy in the context of the COVID-19 pandemic. To assess the supply shock, a telework index that measures the ability of different occupations to work from home, structuring industries as essential or non-essential, was proposed. In terms of demand shocks, the effect of a severe epidemic on the GDP, jobs, and wage income was considered. The shocks are particularly felt at the industry level, delimiting sectors sensitive to demand shocks (transport), to supply shocks (those relating to manufacturing, mining, and services), and to both categories of shocks (entertainment, restaurants, and tourism). These shocks affect low-wage occupations to a greater extent, while high-wage occupations are relatively immune.

The assessment of the impact of COVID-19 on the labor market was carried out by Forsythe et al. (2020) through the correlated analysis of job vacancies, initial unemployment claims, and more traditional employment data. The reduction in job vacancies was recorded independently of the imposition of stay-at-home measures. The increase in unemployment insurance claims and the decrease in employment were manifested in almost all industries and occupations, with different amplitudes depending on their essential and non-essential character and the ability to work at home. It is suggested that this evolution in the labor market is not solely caused by stay-at-home restrictions and, as a result, the probability of a return by removing the restrictions is reduced.

Bartsch et al. (2020) investigated the effectiveness of leadership on the work performance of employees who work predominantly in virtual environments mediated by tension, autonomy and group cohesion, as well as digital maturity. A management oriented towards tasks and relationships ensures the maintenance of performance, under the conditions of individual autonomy at the workplace of employees and team cohesion, the tension related to work being a neutral factor.

2. Materials and methods

The scientific publications included in the analysis were selected from the Web of Science (Clarivate Analytics, n.d.) platform, using the following keywords: “economic”, “remote work”, “work from home”, “remote job”, “distance work”, “mobile work”. The sample consists of 289 address the economic impact of WOCO, involving a number of 904 authors.

In a first stage, a descriptive bibliometric analysis was performed, revealing the trends of publications, the authors productivity and the countries contribution, the most cited meso topics and the main subject areas.

In the next stage, a bibliometric analysis based on network analysis was conducted. The data were processed with VOSviewer software tool. To understand the complexity of the interrelationship of scientific research, the co-word analysis techniques were conducted. Proposed by Callon et al. (1983), co-word analysis studies the structure of scientific publications contents with regard to nature and strength of linkages between pairs of words (Bhattacharya & Basu, 1998). Using the binary counting technique, the term co-occurrence analysis was performed by taking into consideration 10 as the minimum number of the occurrence of a term in titles and abstracts of the articles. A relevance score was determined for each of these

terms. Based on this, the most relevant terms were selected. Correspondingly, we developed the co-occurrence analysis at the level of keywords, considering 5 as the minimum number of occurrences of a keyword. For those that meet the threshold, the total strength of the co-occurrence links with other keywords was calculated. The keywords with the greatest total link strength were selected. By considering the relevant terms and keywords, which capture the essence of the subject of a scientific paper, a specific network of themes and their relationships was built.

“The co-author clusters appeared to be meaningful, with respect to the identification of research groups, the relations within these groups, as well as to relations between these groups and changes in time” (Peters & Van Raan, 1991, p. 235). A co-authorship analysis by documents was carried out. The threshold was 2, as the minimum number of documents of an author. For each of the document which meet the threshold, the total strength of the co-authorship links with other authors was determined, being selected those with the greatest total link strength.

Two publications are bibliographically coupled if they cite an item of reference used by both (Kessler, 1963). A bibliographic coupling analysis by documents was conducted. The thresh-old was 5, as the minimum number of a document. For each of the document who meet the threshold, the total strength of the bibliographic coupling links with other documents was determined, being selected those with the greatest total link strength.

The analysis process is presented in the Figure 1.

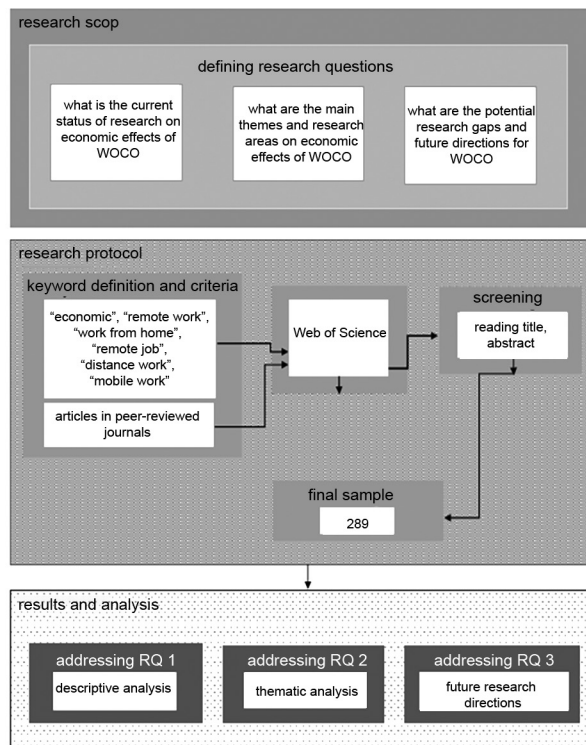


Figure 1. The analysis process

3. Results

3.1. Descriptive analysis

The issue regarding WOCO and its impact has presented a similar evolution to that of the implementation of this work regime in the practice of employers. The first research in economic topic was conducted by Olson (1983) which analyzed the changes that the implementation of office technology generates in the individual work patterns, management control and organizational structure. In the period 1991–2019, the interest in this field was relatively low, unsteady, with a significant increase starting with the year 2020 (Figure 2). In the context of the crisis caused by COVID-19 pandemic, the need for social distancing imposed WOCO as an option, the measure supported by the level of development of information and communication technologies. In order to respond to the requirements of the business environment and political decision-makers, the scholars included the issue in their research.

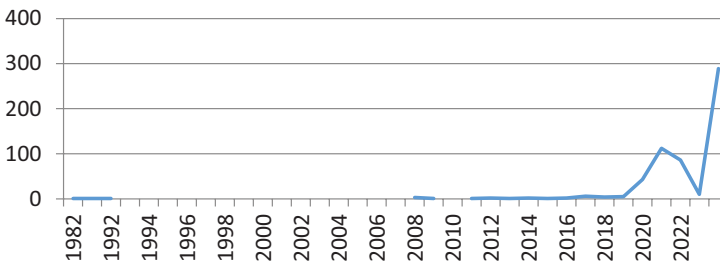


Figure 2. Scientific publications trend

The most productive countries in researching the WOCO from an economic perspective, according to WOS, are USA ($n = 69$), Canada ($n = 24$) and England ($n = 22$).

904 authors conducted 289 scientific papers, presenting an average productivity of 0.32. According to WOS, the most prolific authors in the analysis of the economic impact of WOCO are: Shearmur (2021), Zenktele et al. (2021). The publication of several articles in the field ensures a high quality of the research and relevant results.

The Gender and Sexuality Studies ($n = 58$) is the most cited meso topics in the case of the economic effects of WOCO, highlighting the complexity of the issue from a gender perspective. WOCO generates opportunities for ensuring gender equality and eliminating structural barriers through a higher degree of inclusion of women in the labor market and a high flexibility in the organization of working time, with impact on work-life balance. Capitalizing the differences in perception regarding autonomy in organizing and carrying out activities, exercising control over them, feeling work-intensity as a result of WOCO by women and men, implementing appropriate procedures, creating relational support, a proactive work-support through a high-performance management are factors in ensuring higher productivity and employee health. Economics is of interest, circumscribing the analyzed topic ($n = 27$). Thus, Management ($n = 17$) is another highly cited meso topics. The issue is addressed primarily in the context of the COVID-19 pandemic, which implies Virology-General ($n = 25$).

The main subject areas addressed in scientific papers regarding economic of WOCO are: Economics ($n = 58$), Management ($n = 29$), Environmental Sciences ($n = 26$), Business

on the degree of employment. Particularities during the COVID-19 pandemic; ii) technology and digital infrastructure development, basic conditions in the practice of companies that implement WOCO; iii) economic performance and productivity under the WOCO circumstance; iv) carrying out economic activities from the perspective of WOCO application.

Research theme 1: The impact of WOCO on the degree of employment. Particularities during the COVID-19 pandemic

The health crisis triggered in 2020 had a significant impact on the labor market (Bieszk-Stolorz & Markowicz, 2022). The economic activity at the level of each state and each entity part of the labor market experienced a great challenge, implementing WOCO systems rapidly, or in some cases suddenly. An increase in the number of people working from home in the household is associated with an increase in subjective job insecurity (Nappo et al., 2022). The impact of COVID-19 on the labor market was very serious, many employees losing their jobs during this period. Unemployment affected almost all industries and occupations, with differences in the degree of damage, depending on their character (essential/non-essential) and the possibility of WOCO (Forsythe et al., 2020). The risk of transition to unemployment was higher in the case of people who are not able to carry out WOCO (Cetrulo et al., 2022). Handwerker et al. (2020) inventoried the studies on the reduction of jobs as a result of the pandemic, with the aim of identifying solutions for the reintegration of human resources laid off. As a result of massive layoffs, in an economy in lockdown, unemployment increased rapidly, so identifying the role of WOCO as a positive factor in progress towards recovery has provided solutions for both organizations and employees. Complementary, the involvement of governments in solving the problems generated by the intensification of unemployment during the COVID-19 materialized through the adoption of different fiscal policies at the level of each state, the efficiency of them differing from one country to another as a result of political regimes (Salazar, 2021).

Research theme 2: Technology and digital infrastructure development, basic conditions in the practice of companies that implement WOCO

The development of digital technologies, as well as the expansion of WOCO practices, have a direct impact on the transformation of the labor market (Dubrovskaya & Kosonogova, 2021). The telework and ICI'-based mobile work will support labor market resilience during and after the corona-virus outbreak. In this context, digital skills will become more important (Zamfir & Aldea, 2020). The possibility of implementing WOCO, in times of crisis, such as COVID-19, can be appreciated as a necessity both for business continuity, as well as for survival (Urbaniec et al., 2022). From a managerial perspective, the main benefits and barriers to remote work are the company's previous experience, the support provided to employees by company, the monitoring of the effects of remote work and the implementing of new IT technologies (Urbaniec et al., 2022). The inequality in the implementation of telework as well as the relationship between informality and remote work opportunities are determined by the structure of the economy and digital infrastructure (Schulz et al., 2023). The multiplier effect of digital infrastructure development encompasses both direct and indirect job creation through the expansion of telework, as well as the incidence of the accumulation of virtual human capital and distance learning. The jobs and economic transformations involves investments in infrastructure, as well as complementary investments in human capital, generating

the reduction of poverty and inequalities through more and better formal employment (del Carpio et al., 2022).

Research theme 3: Economic performance and productivity under the WOCO circumstance

Investigating the employees' performance and productivity in WOCO, through a review of literature, Anakpo et al. (2023) recommended forming and strengthening capabilities in the field of technology and information technology (IT) of those on WOCO as a measure of improving performance even after the pandemic (Anakpo et al., 2023). One of the most important indicators for a company is the efficiency of remote work (Belostecinic et al., 2021). The level of expected productivity can be achieved only by developing appropriate telecommuting strategies (Nayak & Pandit, 2021). The flexibility to choose where to live for those workers moving from working from home to working from anywhere influences labor productivity (Choudhury et al., 2021). The size of the company is a factor to consider when it is measured the performance of an activity under the conditions of using WOCO, both during the pandemic period, as well as after, since calling for this measure allowed small firms to perform under the conditions of major changes in the economy, and can have a permanent impact on the industrial structure and people's working life (Zhang et al., 2022).

Research theme 4: Carrying out economic activities from the perspective of WOCO application

Monusova (2021) inventoried the types of work in direct correlation with the actual places of activity and identified the heterogeneity of these, manifested by employment, different working conditions, work safety, as well as the duration of travel to/from the workplace, with direct effects on the distribution of economic benefits and on health, accentuating inequalities of treatment on the labor market. The WOCO review addressed sustainability issues, increased rates of remote work representing an important opportunity to improve sustainability outcomes (Moglia et al., 2021), but also the study of the reaction of the unemployed to adapt to the situation and/or to quickly make decisions to accept an offered job, regardless of the place of activity, the schedule or the conditions offered.

3.3. Keywords co-occurrence

Of the 1368 keywords from scientific papers that address economic issues in the context of WOCO, 69 meet the threshold.

In the construction of knowledge in this topic, the nodes with the highest total link strength identified in this research are: COVID-19 (278), those included in WOCO (especially in telework – 156, remote work – 78, work from home – 49), employment (78), performance (58), mobility (41), flexibility (39) satisfaction (37) and productivity (35), contributing to the most frequent co-occurrence links in the co-occurrence network of the keywords. The link between COVID-19 and WOCO nodes, telework predominating, is the most prominent co-occurrence link, relevant to the expansion of the use of this type of work in the pandemic context as a solution to maintaining social distance in order to prevent the spread of the virus. The co-occurred nodes COVID-19 and unemployment highlight the concern in ensuring employment, considering the changes in the labor market in the

demand and supply of jobs, as well as the concerns of political decision-makers in terms of social protection. Other important co-occurrence links are between COVID-19 and performance, respectively productivity, as well as between telework and performance, respectively productivity, corresponding to the concerns of ensuring an efficient use of the workforce in the new configuration of working conditions. Also, complementary to concerns regarding the results of the economic activity, significant co-occurrence links are those between work and flexibility, respectively mobility, time, distance, highlighting the main problems related to the work organization. The flexibility of the work schedule and mobility generate a higher degree of satisfaction, and the improvement of performance and productivity.

3.4. Co-authorship

Of the 904 authors who researched the economic-WOCO topic, 25 meet the thresholds, those with the greatest strength of the co-authorship links with other authors being selected.

The largest set of connected items consists of 5 items (Figure 4): Khan,S.I.–Kouzani, A.Z.–Mahmud,M.A.P.–Munawar,H.S.–Qadir,Z. (Munawar et al., 2021a, 2021b), who studied the impact of measures to prevent the spread of the virus (lockdown, quarantine, social distancing) on transport and the changes in the mobility patterns, respectively transport preferences. The collaborative networks are ensured by the institutional affiliation and national belonging.

3.5. Bibliographic coupling

Of the 289 documents, 111 meet the thresholds, the largest set of connected items consisting of 96. As a novelty, 9 clusters were identified, corresponding to the issue of interest (Figure 4).

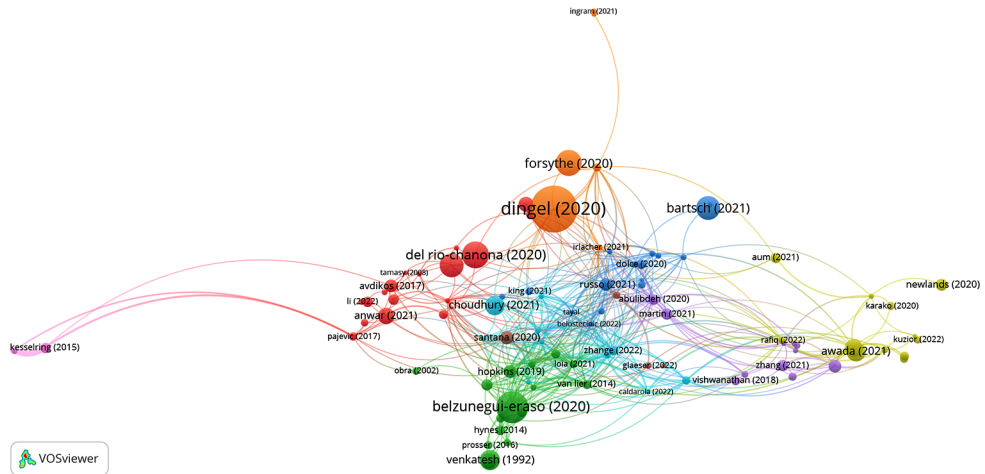


Figure 4. The network of bibliographic coupling by documents.

Cluster 1: Working conditions

Communication technologies and digital platforms have changed the configuration of work. The expansion of work beyond the traditional space, especially through digital mediation, determines an increase in jobs, a change in working conditions in terms of location,

working time, and remuneration, with economic and on the subjective well-being incidents. Anwar and Graham (2021) highlighted that in areas characterized by low incomes and high unemployment rates, remote work improves living conditions from the perspective of freedom, flexibility, precariousness and vulnerability. The restrictions imposed during the COVID-19 pandemic imposed new challenges in the organization of work, del Rio-Chanona et al. (2020) stating the dependence on the characteristics of the industries (essential, respectively non-essential) and the extent to which certain activities can be performed remotely. Also, they showed that in the case of remote work, high-wage occupations were relatively immune to negative labor market supply and demand shocks, while low-wage occupations were much more vulnerable.

Cluster 2: Work design

Belzunegui-Eraso and Erro-Garcés (2020) pointed out that the use of WOCO, as a measure of stability and continuity of work processes in the conditions of the pandemic crisis of COVID-19, required the application of new regulations regarding labor contracts, as they provided for certain clauses, circumscribed to a specific context, not that of crisis. WOCO had consequences on the unequal involvement of the members of the same household in activities, with a significant increase in those performed especially by women with children, compared to men (Yaish et al., 2021). Venkatesh and Vitalari (1992) studied the additional work performed at home, as a continuity of work within the organization (primary form of WOCO), considering its contribution to the modification of the organizational design and the employer-employee relationship, being characteristic of professionals and managers, with high degree of involvement in professional issues. The place of occupational activities is of particular importance in the quality of the work, with consequences on performance. Different models of work, including WOCO, have contributed to economic development, generating changes in homes and communities, opening new horizons in the planning and design of residential communities (Gurstein, 1996).

Cluster 3: New managerial perspectives for WOCO

WOCO, in the conditions of COVID-19, imposed specific management methods, adapted to the new challenges. Bartsch et al. (2020) highlighted that the behavior of the managers assumed changes, in the sense of better organization, by determining and tracking precise, well-defined tasks for subordinates, correlated with the establishing clear functional relationships, to ensure the maintenance of performance at the collective level, as well as the preservation of team cohesion, aiming to smooth out the effects of autonomy and diversification as a result of working from outside. Shipman et al. (2021) revealed that employee productivity can be increased through a constructive management of conflicts, their effective resolution contributing to the growth of individual and organizational performance. In the case of small companies, effective management based on best practices and support given to those working remotely is the way to success. Analyzing the importance of communication quality, Russo et al. (2021) consider the importance of the support provided by line managers, as predictors of well-being and productivity during the COVID-19 pandemic.

Cluster 4: The sustainable issues in the context of WOCO

According to Awada et al. (2021), WOCO also had consequences on sustainability issues, since what represents a negative effect on the health of employees from the perspective of lack

of comfort and well-being, economically materialized in a cost of “sick buildings” was found in the concerns for the design of sustainable buildings. Kuzior et al. (2021) pointed out that digitization and outsourcing of activities have contributed to diminish in CO₂ emissions, by reducing travel/commuting, plastic waste and energy consumption, all of which being targets for sustainable economic growth.

Cluster 5: WOCO and the transport sector

Zhang and Zhang (2021) consider that promoting remote work, online shopping and sustainable public transport ensures strong decarbonisation of the transport sector in the post-COVID world. Vishwanathan et al. (2018) mentioned that changing behavior through substituting demand in transport by expanding telecommuting will reduce CO₂ emissions.

Cluster 6: The impact of WOCO on productivity

Zhang et al. (2022) highlighted that for small companies, the implementation of WOCO increases productivity, especially due to a better use of working time, through un-limited access to work. Complementarily, introducing the concept of work-from-anywhere, Choudhury et al. (2021) revealed that, due to spatial, temporal and geographical flexibility, this work arrangement can improve productivity.

Cluster 7: Inequality in WOCO circumstances

Assessing the possibilities of work organization in the WOCO system, a great inequality can be observed from an occupational and geographical perspective, as well as in terms of wages. According with Dingel and Neiman (2020) not all occupations can be carried out from a place other than the base one, the percentage differing from area to area, and industry to industry. The inequality of treatment is also reflected in pecuniary aspects, with employees in the WOCO system achieving higher incomes. At the macroeconomic level, it has been observed that countries with a lower degree of development, poorer states, can carry out work in the WOCO system in even lower percentages compared to rich countries.

Cluster 8: WOCO and changes in the structure of activities during COVID-19 pandemic

Althoff et al. (2022) noted that the involvement of employees in remote activities has generated important changes in the structure of activities and implicitly of jobs. As a result of the COVID-19 pandemic, many service activities have closed or turned to WOCO for their employees, which has significantly reduced consumption in certain areas, with direct consequences for the structure of work in other sectors as well.

Cluster 9: WOCO, mobility regimes and social change

Kesselring (2015) considers that WOCO automatically involves spatial mobility, which simultaneously generates the development of a modern society, but also new challenges regarding the control of mobile workers and social cohesion.

4. Discussions

The implications of this study are aimed at scholars, the bibliometric analysis highlighting the connections between scientific papers and researchers in the subject, identifying cumulative and correlative aspects considered relevant, the conditions and requirements within the phenomenon, confirming and conferring credibility to the results of previous research through consistent studies, with updating over time depending on the changes

that have taken place, allowing the outline of future research directions. The theoretical implications of the study consist in the conceptual and instrumental development of management, especially that regarding human resources, by proposing the WOCO concept, identifying the requirements regarding the development of technology and digital infrastructure, conditionalities on the employment rate and on economic performance and productivity under the WOCO circumstance. In practical terms, the bibliometric analysis is of interest both at the microeconomic level, for managers, in decisions-making regarding the efficiency of human resource management to increase labor productivity and performance, as well as at the macroeconomic level, for policy makers, to ensure the legislative framework necessary for the development of work in WOCO, with the harmonization of the objectives of economic growth and those of social protection, the optimal functioning of the labor market, the reduction of environmental protection costs, the fair bearing by the employer and the employee of the expenses related to WOCO. For employees, the study is of interest, providing information on the labor market, the demands and directions of the current work environment.

The economic effects of WOCO target multiple aspects. The WOCO has a significant impact on the degree of employment, with particularities during the COVID-19 pandemic. It can reduce frictional unemployment through the flexibility of the work schedule, prevent structural unemployment, through the awareness of the need for the permanent improvement of the skills of employees and reduce voluntary unemployment, through the improvement of work-life balance. In periods of economic crisis or recession, the labor market is significantly affected, with high rates of unemployment, conjunctural/cyclical, WOCO constituting a viable and sustainable solution for maintaining employability.

The implementation of WOCO requires technology and digital infrastructure development, respectively investments, and sources of financing, with direct impact on the transformation of the labor market, involving the development of skills, the diminish of informal phenomena, generating the reduction of poverty and inequalities.

WOCO determines the change of working conditions in terms of location, working time and remuneration, depending on the characteristics of industries and the extent to which certain activities can be carried out remotely. It also involves changing the organizational design and the employer-employee relationship, being effective in the case of people with a high degree of involvement. As such, WOCO imposes new managerial perspectives, by adapting methods, by assigning and monitoring precise, well-defined tasks for subordinates, in conjunction with the establishment of clear functional relationships, to ensure the maintenance of performance at the collective level and the preservation of team cohesion.

Investments in human capital and technology, psycho-social effects, optimization of costs, a constructive management, better use of working time, through un-limited access to work constitute premises for increasing economic performance and productivity under the WOCO circumstance.

Complementary to the new pattern at the level of corporations, there are changes in the structure of activities at the level of economies. Also, WOCO has consequences on sustainability issues, through sustainable buildings, diminish CO₂ emissions, by reducing plastic waste and energy consumption.

Conclusions

The originality of the scientific approach lies in the topic addressed and the results obtained. The contributions of our research aim at multiple aspects, in accordance with the research questions. First of all, the results reveal that there is a high increase in the number of research papers published parallel to the expansion of WOCO. The most relevant papers concerning the economic effects of telework were highlighted, as well as the most cited, according to WOS. The most productive countries in researching the WOCO from an economic perspective are USA, Canada and England. Author productivity in the case of studying the economic effects of telework is 0.32, the most prolific authors being identified. The most cited meso topics is the Gender and Sexuality Studies, WOCO creating opportunities for ensuring gender equality and eliminating structural barriers through a higher degree of inclusion of women in the labor market and high flexibility in organizing working time. Economics and Management are highly cited meso topic, as Virology-General, issue being addressed primarily in the context of the COVID-19 pandemic. Secondly, the term co-occurrence analysis allowed structuring them in clusters, corresponding to the research themes: i) the impact of the WOCO on the degree of employment, aiming to reduce unemployment, through measures at the company level, but also through government policies; ii) technology and digital infrastructure development, basic conditions in the practice of companies that implement WOCO; iii) economic performance and productivity under the WOCO circumstance; iv) carrying out activities economic from the perspective of WOCO. The consistency of the approach was ensured by keywords co-occurrence analysis, which revealed the same main aspects. In the construction of knowledge in economic topic, the nodes with the highest total link strength are: COVID-19, those included in WOCO, especially in telework, remote work, work from home, employment, performance, mobility, flexibility, satisfaction and productivity, contributing to the most frequent co-occurrence links in the co-occurrence network of the keywords. The bibliographic coupling by documents has revealed the theoretical orientations in economic topic: working conditions, work design, new managerial perspectives for WOCO, the sustainable issues in the context of WOCO, WOCO and the transport sector, inequality in WOCO circumstances, WOCO and changes in the structure of activities during COVID-19 pandemic, WOCO, mobility regimes and social change. Thirdly, the span of opportunity for future research is vast. The analysis carried out allows the identification of potential research gaps and the formulation of future research directions, which aims at both qualitative and quantitative aspects, including:

- Promoting leadership in the implementation and use of WOCO: leadership is an essential performance condition through the shaping of an organizational culture based on mobilizing values, assumed by all those involved. The valorization of human creativity by converting potential into creative effectiveness is found in superior economic performance, in the development of social relationships that support the synergistic development of the entity and its members. Work satisfaction, regardless of the place where it takes place, ensures the employee's commitment to the company, increasing the productivity. Complementary to a greater degree of autonomy in the organization of the activity, WOCO assumes relationships and communication both with the other

- employees and with the managers. WOCO changes the paradigm of organizational culture, the organizational models, requiring leadership, which through vision and the art of employment, ensures the effective involvement of team members and the capitalization of opportunities;
- Reconsidering management by including individualized managerial practices: by re-locating responsibilities, WOCO involves an individual-level assumption of the decision-making process to a certain extent, according to the company's procedures. In this context, the conflict between manager and employee may appear in the performance of activities, mediated by the autonomy-control ratio promoted by the company;
 - The nature of inclusion in WOCO: considering the significant impact of psychological well-being is relevant in ensuring the success of WOCO. The mandatory imposition of this regime can determine a negative attitude, with losses in capitalizing on its advantages. Voluntary inclusion, in order to obtain superior temporal and spatial flexibility, to ensure work-life balance, to select a space that involves a pleasant, relaxed environment, can provide favorable effects both for the individual and company;
 - The analysis of the impact of WOCO on competences: staying behind information inflows by performing the activity out of the company's offices can affect competences and skills, with amplification over time, to the extent that social isolation degrades mental health;
 - The relationship between WOCO and informality: carrying out the activity outside the company's offices can have divergent incidents on the informal phenomenon involved in work, generating either the extension of the activity in an informal setting, to avoid the payment of contributions related to salaries, or the inclusion in formal processes of people from different areas, with lower salaries, but with appropriate skills in order to make the company profitable;
 - Measuring the economic effects of WOCO: considering the complex and divergent nature of the incidents generated by WOCO, their evaluation requires multifactorial models and the development of indexes, as aggregate sizes. From an economic point of view, the main indicators are those related to employment, the efficiency of the use of labor force, and salaries.

Inevitably, this study may have several limitations. A limitation of this analysis is its restriction to the relevant terms from titles and abstracts. The analysis was performed on the assumption that researchers include the most relevant words in these two parts. Furthermore, in order to ensure the consistency of the approach, complementary keywords occurrence analysis was conducted, considering that they capture the essence of the subject of a scientific paper, being relevant in identifying a specific network of themes and their relationships. Secondly, the bibliometric methodology is itself a limitation. The bibliometric methods are quantitative by nature, being used in formulating some qualitative aspects. Using words as the unit of analysis in bibliometric methodology has disadvantages; certain words are used in several contexts, so reading publications is necessary to understand the meaning of the relationships between the words. In addition, some words can be general and therefore it can be difficult to assign them to a topic group. Regarding the relevance of the research, a researcher can produce few units of academic research that are nevertheless fundamental for

a certain field. Standardized measures are irrelevant in these situations. On the other hand, large research teams can produce many research papers, each with a large number of authors, creating research and citation networks without having a significant impact on the field.

Author contributions

Conceptualization, MAP and IDC; methodology, MAP and IDC; resources, MAP and IDC; writing–original draft preparation, MAP and IDC; writing–review and editing, MAP and IDC. All authors have read and agreed to the published version of the manuscript.

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