

Bibliometric analysis of Indonesia's labor dynamics: Future works, digital transformations, and contemporary employment landscape shifts

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ABSTRACT

This study conducts a comprehensive literature review to understand the direction and trends in contemporary labor studies, emphasizing significant global issues attracting scientific attention. Employing a scientometric approach, recent research data is explored using bibliometric analysis. The research adopts a mixed-methods approach, utilizing National Labor Statistics and conducting Focus Group Discussions (FGD) for nuanced insights into labor conditions in Indonesia. A bibliometric analysis of Scientific Labor Research Articles in Scopus (2020-2022) identifies trends and classifies global labor-related topics. Results highlight challenges in the labor landscape, driven by technological advancements and globalization, impacting job security, creating skill gaps, and raising concerns about the Fourth Industrial Revolution. The informal sector, particularly pronounced in Indonesia, poses challenges related to poverty, inequality, and the gig economy. Emerging issues like informal care for the elderly, social capital, and informal learning call for nuanced policy approaches. Indonesia's aging population adds complexity, requiring sustainable support mechanisms for healthcare and social services. The digital landscape, specifically Fintech, plays a significant role, yet research gaps persist. Bridging the digital talent gap is crucial for effective digital transformation, necessitating collaboration between government, educational institutions, and industry players. Challenges in Fintech development highlight the importance of initiatives promoting digital literacy, ethical practices, and regulatory frameworks. In conclusion, a holistic and collaborative approach is essential for navigating complexities and fostering sustainable economic growth.

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1. Introduction

The Russian invasion of Ukraine has affected commodity markets, supply chains, inflation, and exacerbated the slowdown in global economic growth (Guenette et al., 2022; Alam et al., 2022; Maurya et al., 2023). High global inflation coupled with weak growth echoes the stagflation of the 1970s, prompting a sharp tightening of monetary policies in developed countries and potentially causing financial pressures in developing countries (Ha et al., 2022). Strong and comprehensive policy responses are needed to promote growth, strengthen the macroeconomic framework, reduce financial vulnerabilities, and support vulnerable groups. The growth in the world's three largest economies—United States, China, and the European Union—has weakened, with significant implications for other nations. This global economic slowdown will undoubtedly have widespread impacts. The surge in food and energy prices is feared to erode real incomes, triggering a global cost-of-living crisis, especially for the most vulnerable groups, including in developed nations (Neal, 2022; Broadbent et al., 2023). At the same time, the rise in government borrowing costs and significant capital outflows exacerbate fiscal pressures and balance of payments in many developing countries (Gaspar et al., 2023). Against this backdrop, the global economy is now projected to

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grow between 2.5 and 2.8 percent in 2022. Although the baseline forecast for 2023 is highly uncertain, some indicators suggest further slowing in global growth. The economic outlook for 2023 is filled with uncertainty. There is a possibility that one in four global growth rates will fall below 2% in 2023, and 10% to 15% will fall below 1% (Nugraha, 2022).

The global recession's impact on Indonesia's trade is reflected in the decline in the demand for durable commodities such as automotive, textiles, garments, and furniture. According to the Indonesian Export Companies Association (GPEI), this decrease in demand is attributed to the extended lockdown policies in China, hindering the increase in Indonesia's import-export activities (around 30% of Indonesia's non-oil and gas imports originate from China). This situation is compounded by inflation and decreased purchasing power in the main export destinations in Europe and the United States, averaging around 30%. The Indonesian Footwear Association (Aprisindo) also notes a continual decline in export orders for the domestic footwear industry since July 2022 (order cancellations). Similar observations are conveyed by the Entrepreneurs of Textile Products in West Java Province (PPTPJB), indicating a decrease in production capacity and subsequent workforce reductions (layoffs). Although factories remain operational, the employee capacity has fallen below 50% compared to previous periods. In addition to reducing production capacity, some companies unable to sustain operations have been forced to cease their activities. PPTPJB data reveals that at least 18 garment factories have closed in West Java province. Despite the adverse economic shocks affecting many countries, inflation in Indonesia remains relatively controlled, and the economy is returning to pre-pandemic levels despite the looming global economic recession and ongoing geopolitical uncertainties posing threats to the economy. Indonesia benefits from the commodity boom, with the trade balance turning positive in the third quarter of 2021, particularly through increased fiscal government revenue, mainly from export taxes and non-tax revenue from natural resources (Wihardja & Wijaksana, 2022). According to the Central Statistics Agency (BPS), Indonesia's trade balance in October 2022 continues to show a positive record, with a surplus of USD 5.67 billion, higher than the previous month's surplus of USD 4.97 billion. This positive performance extends Indonesia's trade surplus trend since May 2020. With this development, Indonesia's trade balance for January-October 2022 overall recorded a surplus of USD 45.52 billion, significantly higher than the achievement for the same period in 2021, which was USD 30.90 billion. The surplus in the trade balance in October 2022 is attributed to an increased surplus in non-oil and gas trade and an improvement in the deficit in oil and gas trade. Similar sentiments are reflected in the global macroeconomic risk map, placing Indonesia in the "medium risk" category. Not only is recession a threat to all countries, but various other crisis-driving factors must not be overlooked, such as the ongoing pandemic, climate crisis, and potential natural disasters that could impact Indonesia, increasing the risk of livelihood and life loss. Trends in technological disruption, the Gig Economy, labor market informalization, and changes in work methods and relationships are also critical issues to be understood, especially in the context of labor protection and social guarantees. Therefore, this research will employ various relevant approaches to discern common threads amid economic and labor market uncertainties and anticipate future challenges.

In a paradigmatic sense, research on labor conditions in Indonesia must be situated within the inseparable context and relationships with the social, economic, and political dynamics occurring globally. Therefore, to commence this study, a literature review of existing scientific studies was conducted to ascertain (1) the direction and trends in contemporary labor studies and (2) the significant issues that concern or attract the attention of scientists worldwide. To obtain this overview, a scientometric approach was employed by exploring recent research data using bibliometric analysis. Once the trends and critical issues in labor studies were mapped, this research was narrowed down to the national context in Indonesia through an analysis of available secondary data, such as Sakernas data from BPS and survey data from the World Bank related to the economic and labor situation in Indonesia. The analysis of macroeconomic labor data will provide context and continuity to the global and national issues that need to be anticipated, especially in the context of social protection for laborers in Indonesia. The outcome of this study is presented in the form of the Indonesia Labor Outlook 2022. Furthermore, the research on labor conditions delves qualitatively into the phenomenon of labor market informalization or trends among informal workers. As we know, global trends indicate an increasing number of people entering the informal sector, parallel to the rise of the precariat, outsourcing trends, and the growing prevalence of non-permanent job opportunities. Research in this sector is still scarce, necessitating more studies to understand the dynamics of informal workers in Indonesia. As an output, this research attempts to construct a taxonomy of informal workers with a case study on the online worker community in Indonesia. For a more in-depth analysis of the taxonomy of online workers, this research will utilize a qualitative approach through in-depth interviews, focused discussions, and digital ethnography to complement various data and information needed to build the taxonomy of informal workers.

2. Method

Labor condition research employs a diverse array of methodologies to analyze data and construct a comprehensive understanding of the posed research inquiries. The central focus of this investigation into Indonesian labor conditions is to unravel the intricate relationship between the employment landscape, both at macro and micro levels, and the overarching dynamics of the global economy. Additionally, it seeks to explore how these dynamics intertwine with endeavors to enhance social protection measures for workers. The pivotal question guiding this research is: How does the employment situation in Indonesia intersect with the broader currents of the global economy, and what strategies can be implemented to expand social protections for workers?

Delving into more specific inquiries, the research aims to shed light on the overview of global economic conditions in the year 2022. It also seeks to provide insights into the national employment outlook for the same period, offering a comprehensive understanding of the trends and current situations surrounding emerging job sectors, particularly those involving future works and online workers, along with their anticipated challenges. Lastly, the research endeavors to explore strategies and initiatives for expanding social protection mechanisms, specifically addressing contemporary labor challenges that have become increasingly relevant in today's dynamic and evolving work landscape.

The research employs a mixed-methods approach to comprehensively investigate labor conditions in Indonesia. The first data source involves National Labor Statistics obtained from Sakernas (2018-2022) provided by the Central Statistics Agency (BPS) and various Ministries/Agencies. The methodology encompasses both descriptive statistics and qualitative deepening through Focus Group Discussions (FGD). This combination allows for a nuanced understanding of the macro and micro aspects of labor conditions, leading to the production of the National Labor Outlook. The statistical analysis provides quantitative insights, while the qualitative exploration through FGDs ensures a richer understanding of the complexities involved. The second data source involves the analysis of Scientific Labor Research Articles published in renowned journals and indexed in Scopus (2020-2022). The chosen method here is Bibliometric Analysis, specifically utilizing scientometric approaches. This analysis aims to identify trends and classify crucial global labor-related topics based on the scientific literature.

The data sources utilized for analysis are drawn from the Scopus database spanning the last three years (2020, 2021, and 2022). The data retrieval process involves conducting searches using a specific combination of keywords relevant to issues in labor conditions, social protection, and forthcoming economic challenges (Table 1). Subsequently, the extracted publications will undergo analysis using the VoSViewer software, enabling the identification and determination of trends and significant issues within the labor sector through bibliometric analysis. The outcomes of this bibliometric analysis will form an evidence-based framework, grounded in robust, objective, and scientifically justifiable studies and scholarly literature. Additionally, the visual appeal and interactive presentation of the bibliometric analysis results will provide a unique experience, offering a distinct perspective in comprehending the knowledge landscape related to labor conditions. The data utilized for analysis is sourced from the Scopus database, covering the last three years (2020, 2021, and 2022). The process involves querying the database using specific combinations of keywords pertinent to issues in labor conditions, social protection, and anticipated economic challenges (see Table 1 for details). The subsequent analysis of the retrieved research publications will be conducted using the VoSViewer software. This software facilitates the identification and determination of trends and crucial issues within the realm of labor conditions through bibliometric analysis. The results of this analysis will serve as an evidence-based framework, rooted in scientifically robust and objective studies and literature. Furthermore, the visually appealing and interactive presentation of the bibliometric findings will offer a unique and engaging way to understand the knowledge landscape related to labor conditions.

3. Results

3.1. Directions and Trends in Contemporary Labor Studies

The documents retrieved from the Scopus database were selected based on specific criteria. These criteria included the inclusion of only "articles" published in peer-reviewed "journals" with finalized status, written in the "English" language, and belonging to the field of social sciences. The time frame for publication ranged from 2020 to 2022.

Table 1

Search Keywords for Articles on Labor Conditions

| | |
|------------------------------|--------------------------------|
| Labor condition | Virtual office |
| Gig economy | Telemedicine |
| Informal workers | Labor movement |
| Informalisation of work | Labor union |
| Digital Technology | Workplace environment |
| Future works | Freelance |
| Skill gaps | Online transaction |
| Access to social protections | labor market |
| precariat | Industrial revolution 4.0 |
| Outsourcing | Society 5.0 |
| Job insecurity | Artificial Intelligence |
| Sharing economy | Migrant workers |
| Social security | Labor protections |
| Casual workers | Work safety |
| Online workers | Occupational safety and health |
| MSEs | Online business |
| Self employment | Youth employment |
| Unemployment trends | Fintech |
| Underemployment trends | Online income position |
| Job automation | Start up |
| Jobless future | Contract workers |
| Digital nomad | |

Table 1 presents a comprehensive list of search keywords employed to retrieve articles related to labor conditions. The keywords were carefully selected to encompass a broad spectrum of topics within the realm of labor studies. The list begins with fundamental terms such as “Labor condition” and expands to cover contemporary labor phenomena like the “Gig economy” and “Informal workers”. The inclusion of terms such as “Digital Technology”, “Future works”, and “Skill gaps” reflects the evolving landscape of work in the context of technological advancements. The table delves into issues such as “Job insecurity”, “Social security”, and “Job automation”, acknowledging the multifaceted challenges faced by the workforce. Emerging trends like “Digital nomad”, “Telemedicine”, and “Fintech” are also considered, reflecting the changing nature of work and economic activities. Additionally, keywords related to labor movements, workplace environments, and the impact of Industrial Revolution 4.0 and Society 5.0 are included, offering a holistic approach to understanding the complexities of contemporary labor issues. This comprehensive set of keywords aims to facilitate a thorough exploration of diverse facets surrounding labor conditions in the selected research articles.

Further analysis indicates that several labor issues have garnered significant attention from researchers worldwide. Notable concerns include issues such as future works, skill gaps, AI, work safety, online business, migrant workers, and others. This underscores the importance of addressing these topics as they represent critical global trends that demand attention in the future. Table 2 provides the outcomes of the scholarly publication search on Scopus for the period 2020-2022. The calculation is based on only the first 2000 articles retrieved from Scopus. The findings include various keywords related to labor conditions, presenting the corresponding number of articles found. Noteworthy findings include a substantial volume of articles on “Future works” (61,384*), “Digital Technology” (720), “Skill gaps” (2,226*), and “Work safety” (3,260*). Additionally, topics like “Labor union” (1,172), “Workplace environment” (1,294), and “Online business” (1,851) exhibit significant scholarly attention. The table reflects the diverse landscape of research on labor-related themes, with asterisks indicating particularly high numbers in certain categories.

Table 2
Results of the search for scholarly publications in Scopus (2020-2022)

| Keyword | Number of Articles | Keyword | Number of Articles |
|------------------------------|--------------------|--------------------------------|--------------------|
| Labor condition | 2,685* | Virtual office | 97 |
| Gig economy | 293 | Telemedicine | 762 |
| Informal workers | 797 | Labor movement | 871 |
| Informalisation of work | 10 | Labor union | 1,172 |
| Digital Technology | 720 | Workplace environment | 1,294 |
| Future works | 61,384* | Freelance | 118 |
| Skill gaps | 2,226* | Labor market | 1,599 |
| Access to social protections | 437 | Industrial revolution 4.0 | 375 |
| Precariat | 105 | Society 5.0 | 219 |
| Social security | 365 | Artificial Intelligence | 3,092* |
| Casual workers | 132 | Migrant workers | 1,694 |
| Online workers | 921 | Labor protections | 747 |
| Self employment | 1,583 | Work safety | 3,260* |
| Unemployment trends | 196 | Occupational safety and health | 750 |
| Underemployment trends | 14 | Online business | 1,851 |
| Job automation | 541 | Youth employment | 752 |
| Jobless future | 12 | Fintech | 345 |
| Digital nomad | 39 | Online income position | 60 |
| Start-up online business | 60 | Contract workers | 346 |

From the results in Table 1, it is evident that “future works” stands out as the most dominant keyword compared to others. Meanwhile, several keywords remain quite marginal or have minimal research coverage, such as “informalisation of work”, “jobless future”, “underemployment trends”, to “digital nomad”, among others. This indicates the need for further studies or research on these crucial issues. In this research, some of the important and intriguing keywords mentioned above will be dissected further as material for refining the understanding of labor conditions in Indonesia, utilizing a bibliometric/scientometric approach. The following are detailed findings from this exploration.

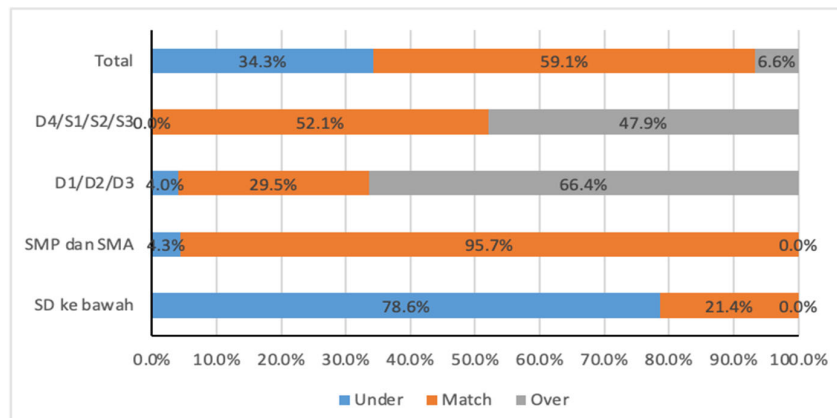
3.2. Skill Gaps in the Era of the Fourth Industrial Revolution

The Fourth Industrial Revolution signifies a massive global disruption. Especially during the COVID-19 pandemic, human reliance on digital technology has become increasingly significant and inevitable. From bibliometric analysis, it is evident that key concepts following the development of Industry 4.0 can be categorized into two main clusters: those related to digital technology (artificial intelligence, big data, machine learning, circular economy, and sustainability) and education 4.0 (education 4.0, innovation, literacy, smart factory, automation, and innovation). Both intersect with discussions on skills and digitalization. The issues of “skills in the digital era” are of serious concern to researchers and policymakers globally, including in Indonesia (Fig. 1).



Fig. 2. Key Issues in Industry 4.0 Literature (2020-2022)

Industry 4.0 represents a complex system that is not easily attainable. One of the major challenges faced by most countries is related to the necessary workforce skills (Mian et al., 2020). Numerous new skills are required, such as AI, IT, data analytics, robotics, etc. There are also other important skills and abilities that need to be mastered, such as cognitive abilities, analytical thinking, decision-making skills, organizational skills, social intelligence, system and technical expertise, logical reasoning, problem-solving skills, etc., all of which can be associated with Industry 4.0. The wide gap between existing skills and the skills needed requires serious attention from policymakers, especially in the fields of education (from basic to university) and labor. The difficulty in adjusting the demand and supply of the workforce will result in skill gaps, which can subsequently lead to mismatches. Workforce mismatch can be defined as the discrepancy between the human capital possessed and the job requirements. There are two forms of mismatch: qualification mismatch and skill mismatch (ILO, 2018). Qualification mismatch is the disparity between the educational qualifications of the workforce and the educational qualification requirements of the job. In this context, the mismatch between the job and the level of education is called vertical mismatch, while the mismatch between the job and the field of study is termed horizontal mismatch. Vertical mismatch, where the worker's education level is higher than the job's education requirement, is known as overeducation. If the education level is lower than the job's education requirement, it is termed undereducation (Hasibuan & Handayani, 2021). Furthermore, this educational mismatch can have repercussions on the wages received. For instance, in the case of overqualified workers, they may receive wages below the standard level. This can lead to decreased job satisfaction, low work productivity, an increased risk of unemployment, higher unemployment benefits, and a loss of income tax revenue (Puspasari, 2019).



Source: Sakernas 2021, data processed

Fig. 2. Vertical Mismatch in Indonesia, 2021

Based on the data from the National Labor Force Survey (Sakernas) 2021 by the Central Statistics Agency (BPS), vertical mismatch in Indonesia remains relatively high, with 34.3% for undereducation and 6.6% for overeducation (Figure 3). At the lower educational level (elementary school and below), undereducation is dominant (78.6%), indicating that many low-educated workers hold positions requiring higher levels of education. Jobs that match with low-educated workers are predominantly in the unskilled labor category, but field observations reveal that some of these workers are engaged in skilled roles in agriculture, plantation, forestry, and fisheries (45.8%). Others work in service enterprises and sales roles (16.9%). The majority of these workers operate in the informal sector, where productivity is not particularly encouraging.

At the higher educational level, most workers have jobs that align with their education, such as managerial or professional positions. However, there is still a significant 47.9% of highly educated workers experiencing overeducation, meaning their educational attainment exceeds the requirements of their jobs. Furthermore, some highly educated workers are employed in unskilled labor roles. Overeducation among highly educated workers is a notable concern, considering the increasing number of tertiary graduates in Indonesia. Creating suitable employment opportunities that match educational levels is crucial to harnessing the potential of all workers according to their educational backgrounds.

3.3. Informal care and long-term care for the elderly within the informal sector

In addition to the issue of the Fourth Industrial Revolution, labor-related challenges are inseparable from various studies on the informal sector or informal economy. Especially for countries with a very large population like Indonesia, the informal sector remains a primary source of livelihood for a significant portion of individuals and households. Examining the knowledge landscape and studies on the informal sector reveals at least five interconnected issue clusters/groups (Fig. 4). First, the informal sector (in red) still exhibits a strong association with issues of poverty and inequality. Particularly with the advent of the Covid-19 pandemic, the informal sector is also marked by various other issues such as the increasing number of women engaged in sex work, women workers, mental health issues, unemployment, and more.

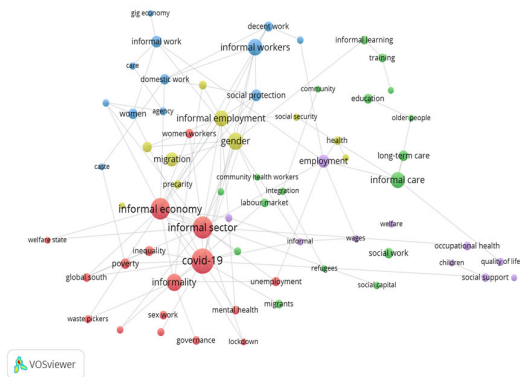


Fig. 3. Key Issues in Literature on the Informal Economy Sector (2020-2022)

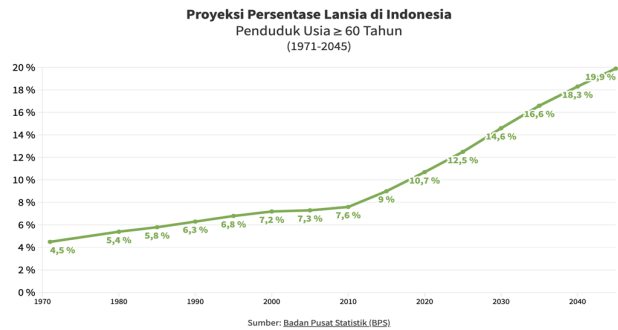


Fig. 5. Projection of the Percentage of Elderly Population in Indonesia (1970-2045)

Secondly, highlighted in green are issues related to informal care and long-term care, especially for the elderly. This is noteworthy considering the challenges posed by the aging population in Indonesia. Additionally, issues of informal learning, training, and workers' social capital become significant concerns identified in the bibliometric analysis related to the informal sector. Thirdly, in blue, the informal sector is closely linked to issues of social protection, the gig economy, domestic work, and decent work. Fourthly, in yellow, migration issues, migrant workers, and the precariat have drawn the attention of researchers studying the informal sector in various countries. Lastly, in purple, wage and worker welfare issues in the informal sector constitute a crucial topic that bridges other relevant issues. Moreover, BPS (Statistics Indonesia) also notes that the dependency ratio of the elderly population in Indonesia reached 16.76% in 2021. This figure represents an increase of 7.85% from the previous year, which was 15.54%. This means that in 2021, for every 100 economically active individuals aged 15-59, there were at least 17 elderly individuals to be supported. This condition aligns with the rising percentage of the elderly population domestically (see the projection in Figure 5). According to BPS, 10.7% of the population, or around 28 million people in Indonesia, were elderly in 2020. This implies that there were 28 million Indonesians aged 60 and above. The increase in the number of elderly individuals will inevitably lead to a higher demand for elderly care, including healthcare and basic needs fulfillment. The government needs to seriously consider various programs and policies for the elderly to reduce the burden of dependency on other economically active age groups. Bibliometric analysis also reveals that studies related to fintech and employment are still very limited. The issue of financial technology has become a trend in the digital world. However, there is still a scarcity of studies connecting fintech with employment issues. Despite Fintech offering promising career prospects for the younger generation, research in this intersection remains minimal. The government, Financial Services Authority (OJK), and Bank Indonesia (BI) have explicitly affirmed their commitment to continuously support the development

and contribution of the fintech industry to strengthen the national digital economy through various regulations. Innovations in digital financial services continue to evolve and are increasingly adopted by the public. The government has various partnership programs with fintech, such as the non-cash distribution of social assistance, especially during the pandemic, the distribution of the Pre-Employment Card where as many as 5.3 million new recipients have a bank account or e-wallet after participating in the program, the use of e-money for transportation payments and various other transactions, as well as online tax reporting and payment. The current major challenges include the low digital literacy of the public and the proliferation of illegal fintech businesses in Indonesia.

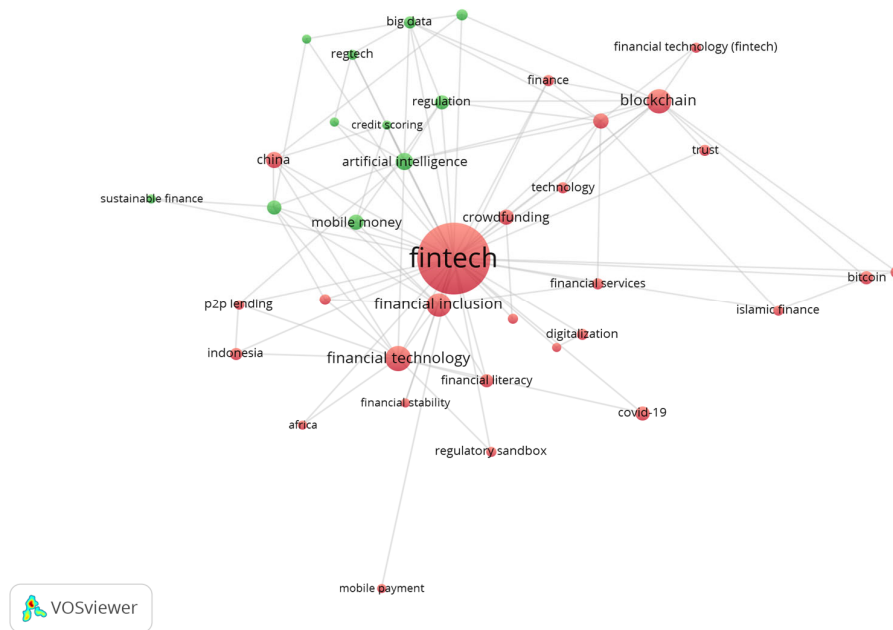


Fig. 5. Key Issues in Literature on the Fintech Sector (2020-2022)

In the bibliometric map presented in Fig. 5, two major clusters of studies related to Fintech are observed, namely those addressing financial inclusion, financial technology, and financial literacy. The second group is associated with artificial intelligence and sustainable finance. Unfortunately, there is still a noticeable lack of studies linking Fintech development to employment issues. Banks and Fintech companies in Indonesia are even competing for IT workforce, resulting in an annual deficit of 500,000 digital human resources in the country. McKinsey research also reveals that Indonesia needs 9 million digital talents during the period of 2015–2030, indicating a requirement for around 600,000 digital talents annually. However, Indonesian universities are currently only able to produce approximately 100,000-200,000 digital talents per year, leaving a shortage of around 400,000-500,000 digital talents annually. This shortfall has the potential to hinder the digital transformation processes across various sectors, including the Fintech and Banking sectors in Indonesia.

The analyses conducted shed light on significant trends and challenges within the contemporary labor landscape. Rapid technological advancements and increased globalization have ushered in a new era, impacting job security, creating skill gaps, and raising concerns about the implications of the Fourth Industrial Revolution (Nam, 2019; Crumpler & Lewis, 2019; Warhurst & Hunt, 2019). Navigating this multifaceted scenario necessitates adaptive strategies to ensure the workforce remains resilient in the face of evolving employment dynamics. Within the labor market, the informal sector emerges as a critical and dynamic component, particularly pronounced in populous nations like Indonesia (Pratomo & Manning, 2022). This sector is intricately linked to pervasive challenges, including poverty (Taufiq & Dartanto, 2020), inequality (Tadjoeddin, 2019), and the rise of the gig economy (Yasih, 2023). Emerging issues such as informal care for the elderly, social capital, and informal learning underscore the need for nuanced policy approaches that account for the unique dynamics of this sector.

Adding to the complexity is Indonesia's aging population, presenting a formidable challenge as the percentage of elderly individuals steadily increases. The rising dependency ratio requires thoughtful planning and support mechanisms for the elderly, encompassing healthcare and social services (Kudrna et al., 2022). Government programs must be designed to effectively manage the growing needs of this demographic, ensuring a sustainable and equitable approach to social and economic support. Turning attention to the digital landscape, the role of fintech is unmistakable, yet research gaps persist, particularly regarding its implications for employment (Santoso et al., 2021). The demand for digital talent outpaces current educational capacities, potentially hindering digital transformation across various sectors (Oxford Analytica, 2021). Bridging this gap necessitates strategic collaboration between government, educational institutions, and industry players to meet the evolving demands of the digital economy. Despite strides in fintech development, challenges persist, notably in addressing

low digital literacy levels and countering the proliferation of illegal fintech businesses (Situmorang, 2022). These challenges underscore the importance of comprehensive initiatives that promote digital literacy, ethical business practices, and regulatory frameworks to ensure the integrity and stability of the Fintech sector. In conclusion, a holistic and collaborative approach is crucial to navigate these complexities and foster sustainable and inclusive economic growth. Overall, the incorporation of bibliometric analysis offers a methodological contribution, showcasing its efficacy in mapping and interpreting scholarly discourse on labor-related issues. The study's theoretical framework provides a foundation for future research endeavors, encouraging scholars to delve deeper into the implications of digital revolutions, global crises, and commodity cycles on employment structures. The exploration of these themes contributes to the advancement of labor theories and provides a nuanced understanding of the complexities inherent in the contemporary world of work. The recognition of the impact of global crises on labor demand emphasizes the importance of contingency planning and resilience-building in the face of unforeseen events. Policymakers and businesses alike can use this information to develop responsive measures, ensuring the stability of employment and mitigating the systemic impacts of crises on the workforce. Furthermore, the insights into the cyclicity of commodity booms call for prudent economic management, especially considering the potential differential impacts on large corporations, households, and government finances.

4. Conclusion

The bibliometric analysis conducted on global research pertaining to employment highlights a paramount focus on "future works" as the predominant keyword and extensively discussed concept among researchers worldwide. This underscores the anticipation of continued shifts in the employment landscape, driven by technological disruptions, ongoing structural changes, and the reverberations of global events such as pandemics. The pervasive discourse on the nature and patterns of future jobs suggests a collective awareness of the dynamic forces shaping the world of work and necessitates proactive measures for adaptation. In the context of Indonesia, the labor market is currently in the midst of significant and ongoing structural transformations. Three primary drivers fuel this metamorphosis: the digital revolution of industrial revolution 4.0, introducing a new economic landscape and demanding novel skills; global crises, such as pandemics or geopolitical conflicts, instigating changes in labor demand and systemic impacts on workforce dynamics; and the cyclicity of commodity booms triggered by global crises, impacting the country's revenue and leading to inflation. Recognizing the multifaceted nature of these transformational sources, continuous monitoring and proactive measures by the Indonesian government and businesses are imperative to navigate the evolving employment landscape effectively. The findings of the research hold several theoretical implications that contribute to the broader understanding of contemporary labor dynamics. The identification of "future works" as a central theme in global employment research suggests a paradigm shift in the conceptualization of work, necessitating a reevaluation of established labor theories. The prominence of this theme signifies a recognition among scholars of the profound impact of technological disruptions and structural changes on the nature of employment. Additionally, the research underscores the interconnectedness of global events, such as pandemics and geopolitical conflicts, with labor market transformations, enriching theoretical discussions on the intersection of economic and socio-political factors. From a practical perspective, the research findings offer valuable insights for policymakers, businesses, and other stakeholders involved in labor market management. The identification of ongoing structural transformations in Indonesia's labor market signals the need for adaptive strategies to align with the demands of the digital economy. Policymakers can use this information to formulate targeted initiatives for skill development, anticipating the evolving needs of the workforce in the era of industrial revolution 4.0.

While this research provides valuable insights into contemporary labor dynamics, it is essential to acknowledge certain limitations. Firstly, the bibliometric analysis, while comprehensive, may not capture every relevant publication due to database limitations and evolving research trends. The scope of the study is limited to the articles indexed in Scopus, potentially overlooking contributions in other databases or non-indexed sources. Additionally, the research timeframe (2020-2022) may not fully capture the long-term trends and transformations in the labor market. The study focuses on overarching themes and global patterns, potentially overlooking nuances specific to regional or industry-level variations. The generalizability of findings to specific local contexts may be limited, necessitating further research at more granular levels. Furthermore, the research primarily relies on existing publications and may not encompass emerging themes that have yet to be extensively explored in academic literature. To address the aforementioned limitations and expand the understanding of contemporary labor dynamics, future research avenues can be explored. Firstly, longitudinal studies can provide a more comprehensive view of the evolving labor market by capturing trends over extended periods. Research that incorporates a multi-method approach, combining bibliometric analysis with qualitative interviews or case studies, can offer a richer understanding of the contextual factors influencing labor dynamics. Exploring the intersectionality of labor market transformations with factors such as gender, ethnicity, and socioeconomic status can unveil disparities and inequalities that may not be evident in a broader analysis. Additionally, a comparative analysis across different countries or regions can elucidate variations in responses to global phenomena and highlight context-specific challenges and opportunities. Lastly, investigating the effectiveness of policy interventions and industry initiatives in response to labor market transformations can provide practical insights for stakeholders. Research exploring the implications of specific technological advancements, such as artificial intelligence or automation, on employment patterns and skill requirements, is crucial for anticipating future workforce needs.

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