International Labour Organization

European Commission

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Webinar: Understanding automation and employment in the apparel and automotive sectors

Meeting report

Webinar of the joint EU-ILO Project "Building Partnerships on the Future of Work"

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Background and motivation

There has been a good deal of debate in recent years on the potential impacts of new technologies on the world of work, industries, and global supply chains. Many acknowledge that these outcomes are uneven, varying across regions of the world, economic sectors, as well as amongst groups of workers, including women and men. Yet there is little evidence on the processes behind these outcomes. Discussions about the employment impacts of new technologies have been renewed as a result of COVID-19 and restrictions related to social distancing – with factory closures and a sharp rise in remote work – and disruptions in global supply chains.

Funded by the EC Partnership Instrument and also involving the EC Directorate-General for Employment, Social Affairs and Inclusion in its steering, the ILO and EC-JRC project "Building Partnerships on the Future of Work" aims at building new knowledge and informing future evidence-based policies addressing the effects of automation technologies in the apparel and automotive sectors on employment and their gender dimension. The main goal is to gain a better understanding of how processes of technological upgrading and industrial automation interact with local social structures, cultural norms (including gender norms) and institutional systems in selected EU and non-EU countries, in the context of global value chains. In 2021, the project focused on building background knowledge on these two sectors, through desk research and data analysis, to pave the way for in-depth case studies planned for 2022 in selected manufacturing establishments across five countries, namely Germany, Indonesia, Mexico, Romania and Spain.

This webinar brought together ILO and external experts to share knowledge and discuss the future of work in the automotive and apparel and footwear industries. The event included presentations of the papers published under the first phase of the project and a discussion with some of the researchers who will be involved in the in-depth case studies.

Organized by the ILO Employment Policy Department and the EC-JRC, in collaboration with the ILO Country Office for Mexico and Cuba, the webinar "Understanding Automation in the Apparel and Automotive Sectors" was held online on 12 May 2022.

▶ Notes on the proceedings

Introductory remarks

Ms. Valeria Esquivel (ILO) opened the meeting with remarks on the project and its objectives, and outlined the structure of the webinar.

- This webinar is part of the ILO and EC-JRC project "Building Partnerships on the Future of Work", funded by the EU. The project encompasses four research components including (i) the effects of automation in the apparel and automotive sectors and their gender dimensions; (ii) platformization of work; (iii) new labour market transition patterns; and (iv) shifts in employment structure in EU and non-EU countries. This webinar relates to the first research topic, automation and gender.
- There has been a good deal of debate in recent years on the potential impacts of new technologies on the world of work, industries, and global supply chains. These discussions have been renewed as a result of COVID-19, its labour market impacts and disruptions in global supply chains.
- Automotive, apparel and footwear manufacturing have historically been instrumental in industrialization and structural transformation processes. These industries have fostered economic growth, provided entry points into the global economy and supply chains, and offered opportunities for formal jobs to workers in developing countries. In this context, the extent to which new and emerging technologies transform the industry has important implications for workers and countries' development trajectories.
- The automotive, apparel and footwear industries were chosen because they are at opposite ends of the spectrum in terms of the gender composition of the workforce and technology use in production processes. There is a growing literature on how automation affects men and women's employment differently, particularly the concern that technological upgrading may be associated with lower participation of female workers in certain sectors. Yet there is little research that directly provides evidence on how this comes to be. There is also little research assessing how the gendered impacts of automation might vary across industries.
- The main goal of this research project is to gain a better understanding of how processes of technological upgrading and industrial automation interact with local social structures, cultural norms and institutional systems in selected EU and non-EU countries, in the context of global value chains. Importantly, the results of this research will support the Office in its efforts to promote gender equality and women empowerment in the world of work.
- In 2021, the project focused on building background knowledge on these two sectors, through desk research and data analysis. This webinar was organized to mark the close of the desk review phase. The research presented today lays the foundation for in-depth case studies planned for 2022 in Germany, Indonesia, Mexico, Romania and Spain.

Presentations

Presentation: Global value chain analysis of the automotive and garment industries: A study of Germany, Spain, Romania, Indonesia and Mexico for 2000-2014

Mr. Gabriel Brondino (Università Cattolica del Sacro Cuore, Italy) presented a project background paper titled "Global value chain analysis of the automotive and garment industries: A study of Germany, Spain, Romania, Indonesia and Mexico for 2000-2014". Key points from his presentation include:

- Institutional and technological changes drive the fragmentation of production in the global economy, with potential impacts on the organization of supply chains. The paper focuses on the automotive and garment value chains in Germany, Spain, Romania, Indonesia and Mexico to examine potential differences, through an analysis of the World Input-Output database, Release 2016.
- Data on final outputs and exports show that the size of the garment sector varies much more than the size of the automotive sector across the five countries under study. The growth of garment output in Indonesia stands out, and Romania has also been growing though it remains much smaller. In terms of exports, while the share of

garment output exported expanded in Germany and Spain, the domestic market has become increasingly important for Indonesia, Mexico and Romania. In regard to the automotive sector, Germany stands out as a leading producer worldwide. There are marked differences in regard to exports, with much higher export shares in Germany, Spain and Mexico than in Indonesia and Romania.

- There are important differences in regard to the foreign employment and value added associated with countries' output. For instance, the share of foreign employment in Germany is high compared to Romania. But there is a trend towards internationalization, as evidenced by the case of Spain. In other cases, there is a trend toward more intensive use of domestic labour, such as in Indonesia and Mexico. Trends are similar for both sectors.
- If we consider foreign value added, the differences observed in regard to labour tend to diminish. There is a trend towards internationalization, although in some cases it remains unchanged, such as in Romania, and in others it decreases, such as in Indonesia. In Mexico, the share of foreign employment has been declining but the share of foreign inputs in output has been rising.
- Trends in income distribution have been changing in these two supply chains. In garments, domestic labour compensation is contracting in all countries, while capital compensation (foreign and domestic combined) has been rising. Trends in the automotive sector are similar, with the exception of Indonesia.

Presentation: Automation and its employment effects: A literature review of the automotive and garment sectors

Ms. Guendalina Anzolin (King's College London) presented the project background paper "Automation and its employment effects: A literature review of the automotive and garment sectors".

- This literature review tries to contribute to a methodological approach that could be used for the fieldwork that will be conducted within the research project.
- There is a lot of interest in technological trends such as automation, digitization and robotization and their impacts on employment. Although quantitative impacts have been more prominent in the discussions, qualitative impacts (e.g. pace of work, autonomy of workers) are also important to examine.
- Automation is an evolutionary rather than revolutionary process, in which the implementation of newer technologies requires human and institutional capabilities. Moreover, impacts vary significantly by sector, depending on its technological intensity, the structure of production processes and other sectoral characteristics.
- The main approaches assessing the impact of automation on employment include skill-biased technological change, routine-biased technological change, and a revisited version of routine-biased change. The gender dimension is an interesting aspect that is often overlooked, with few qualitative and quantitative studies in developed and developing countries, and limited data available.
- Among the determinants of technology adoption, we can highlight costs, production volume, quality, and managerial and business model adopted by the firm. To date, there is little evidence of automation displacing labour. In regard to the automotive sector, one must have a deep understanding of production processes, the technologies already in place and opportunities for new applications. In the garment sector, opportunities for adoption of new technologies vary widely depending on the step of production. There are greater opportunities in the earlier and later stages, with less technology in sewing where labour and value-added are concentrated. Issues that hinder technological upgrading include technical bottlenecks, economic impediments, and skills.
- There needs to be a business case for automation.

Presentation: The state of the apparel and footwear industry: Employment, automation and their gender dimensions

Mr. Kucera (ILO) presented a co-authored research paper conducted for the project, "The state of the apparel and footwear industry: Employment, automation and their gender dimensions".

- The motivation for looking at technological upgrading and automation in apparel and footwear is that the sector has been instrumental in export-oriented industrialization and structural transformation processes. Labour-intensive, the sector has also provided employment opportunities but there are concerns related to the quality of work and gender gaps in pay and occupations, despite the high share of women in the sectoral workforce.

- Today, there is limited automation in key operations, such as sewing, but there are potentially important implications from technological upgrading more broadly. Moreover, there is limited direct shopfloor evidence on the impacts of technological upgrading, including on disparities in the impacts on women and men and how this varies across tasks and occupations.
- A key issue to be examined in the research project relates to disparities in the impacts on women and men, in light of the literature indicating that technological upgrading has, at least in some cases, been associated with defeminization. We are also interested in how technological upgrading is associated with changes in the social and organizational aspects of production, such as the conditions of work, workers' autonomy, industrial relations and other aspects.
- Today, there are various levels of technology in the sector depending on product (e.g. knitted versus non-knitted apparel) and phase of production process (e.g. cutting versus sewing). In addition, there are various approaches attempting to address automation challenges, e.g. Softwear Automation, Maica, Grabit. Importantly, the decision to adopt new technologies in multidimensional and goes beyond technical feasibility, including, for instance, considerations over costs and speed-to-market.
- Critical questions that will be addressed in the next steps of the research project include the impacts of technological upgrading and automation on jobs in apparel and footwear manufacturing, the potential defeminization of the workforce and its underlying causes, and how new development impact existing gender gaps in the industry.

Discussion

After the paper presentations, Ms. Esquivel introduced the first of the two discussants, Mr. Jorge Carrillo. Mr. Carrillo (El Colegio de la Frontera Norte, COLEF) is leading the research on the automotive sector in Mexico. Speaking from the perspective of the automotive sector in Mexico, key points from Mr. Carrillo's intervention include:

- Building on some of the points presented by Ms. Anzolin, Mr. Carrillo highlighted the importance of governance of value chains and the need to place greater emphasis on changes in this area as the organization of global production is not static, with significant changes enabled by digital technologies. There are, for instance, more and more agreements between telecommunication enterprises, OEMs, first and second tier suppliers. He also indicated the need to re-examine the impacts of digitization and automation on specific types of employment, particularly outsourcing and subcontracting.
- Addressing Mr. Brondino's analysis of global value chains, Mr. Carrillo highlighted that it is hard to dissociate and measure hardware and software, hard and soft technologies (e.g. automation and lean production), to pinpoint specific impacts. On one hand, the analysis needs to allow for complementarity but, on the other hand, also for the analysis of each aspect individually, including at the level of industries. Mr. Brondino's work raises new questions for research, e.g. to what extent can value chain structures change when faced with disruptive situations, such as the COVID-19 pandemic? To what extent are the structures of value chains impacted by economic and social tensions? What can we say about paradoxes such as innovation versus precarization, productivity versus stagnant wages and so on? Finally, more qualitative analysis, focused on institutions and business models, for instance, can complement this type of quantitative, structural, analysis.

The next intervention was delivered by Ms. Simona Moldovan (Asociación de Investigación de la Industria Textil, AITEX) who is coordinating the project's research on the apparel and footwear industry in Germany, Romania and Spain. Ms. Moldovan provided comments on the apparel industry in Europe.

- Ms. Moldovan started by reiterating the information presented earlier in the webinar, highlighting that the sector is buyer-driven and remains labour-intensive, with production technologies that have not changed substantially.
- Ms. Moldovan characterized the European apparel and footwear sector as highly feminized, with a relatively aged workforce averaging 50 years of age, and small enterprises with up to 50 employees. Geographically, countries in Southern Europe specialize in apparel production while those in the North focus on textile production, particularly of technical textiles.
- Overall, biggest producers include Italy, France, Germany, Spain and Portugal. Investments in textiles, clothing and footwear account for more than 60 per cent of total investments made by these countries, evidence of interest

in technological upgrading and automation. The European Commission is also providing support to increase competitiveness in the sector.

- Technological upgrading will encompass both software and hardware technologies, as indicated previously. New technologies are appearing simultaneously with organizational innovations, generating more flexibility and shorter learning processes, facilitating best practices.
- Overall, automation requires technological and economic feasibility. Furthermore, as previously highlighted, impacts on employment will be uneven, across countries, sectors and groups of workers. Updated requirements for job execution will also impact work organization and job quality.

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