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

Fernanda Barcia de Mattos, Valeria Esquivel, David Kucera and
Sheba Tejani

Understanding automation and employment in the apparel and automotive sectors
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Motivation

Apparel and footwear have been instrumental in export-oriented industrialization and structural transformation processes, offering employment opportunities, particularly for women.

Limited **automation** today in certain key operations (e.g., sewing) but potentially important implications from **technological upgrading**.

New technologies can change how supply chains organized (reshoring/nearshoring debates)

Outcomes of automation/technological upgrading are uneven and there is little evidence on processes behind these outcomes and why they seem to create and reinforce gender inequalities (Kucera and Tejani, *WD*, 2014; Tejani and Kucera, *DC*, 2021).



► Motivation (cont'd)

Several hypotheses put forth by literature linking technological upgrading with defeminization:

- lesser importance of low-wage women's labour in more capital-intensive production;
- gender norms designating men as primary breadwinners, with men more likely to be hired for higher paying jobs;
- different skills requirements of new industrial jobs combined with the purportedly different skills of men and women workers.

But limited direct evidence for these hypotheses:

- Shop floor level evidence for these and other hypotheses (analysis often at the aggregate or sectoral level).
- Decision-making processes behind those outcomes, and the role of different actors and institutions in shaping them.
- Assessments of how the gendered impacts of automation and tech upgrading might vary across tasks, occupations and industries

▶ An important source of paid employment opportunities for women

▶ **91m**

Workers, globally, in textiles and garments combined in 2019

▶ **50m**

Women workers

▶ **80%**

Estimated share of women workers in garment manufacturing

Employment associated with benefits and challenges

- ▶ Formal jobs
- ▶ Paid employment

But

- ▶ Also many informal jobs
- ▶ Low-skilled, low-paid jobs
- ▶ Poor working conditions
- ▶ Weak compliance with labour rights
- ▶ Gender gaps in pay and occupations

Benefits and challenges linked to structure of global industry

- ▶ Buyer-driven supply chain dynamics.
- ▶ COVID-19 implications for firms and workers.

► Technology and employment in apparel and footwear manufacturing

The future of the apparel and footwear industry depends not only on technological capabilities but also on a host of other factors.

Technology is modernizing but employment impacts are uncertain; no consensus in literature.

Job destruction vs creation dynamics at levels of task, occupation, industry.

Impacts often at task level changing task profile of occupations rather than eliminating them.

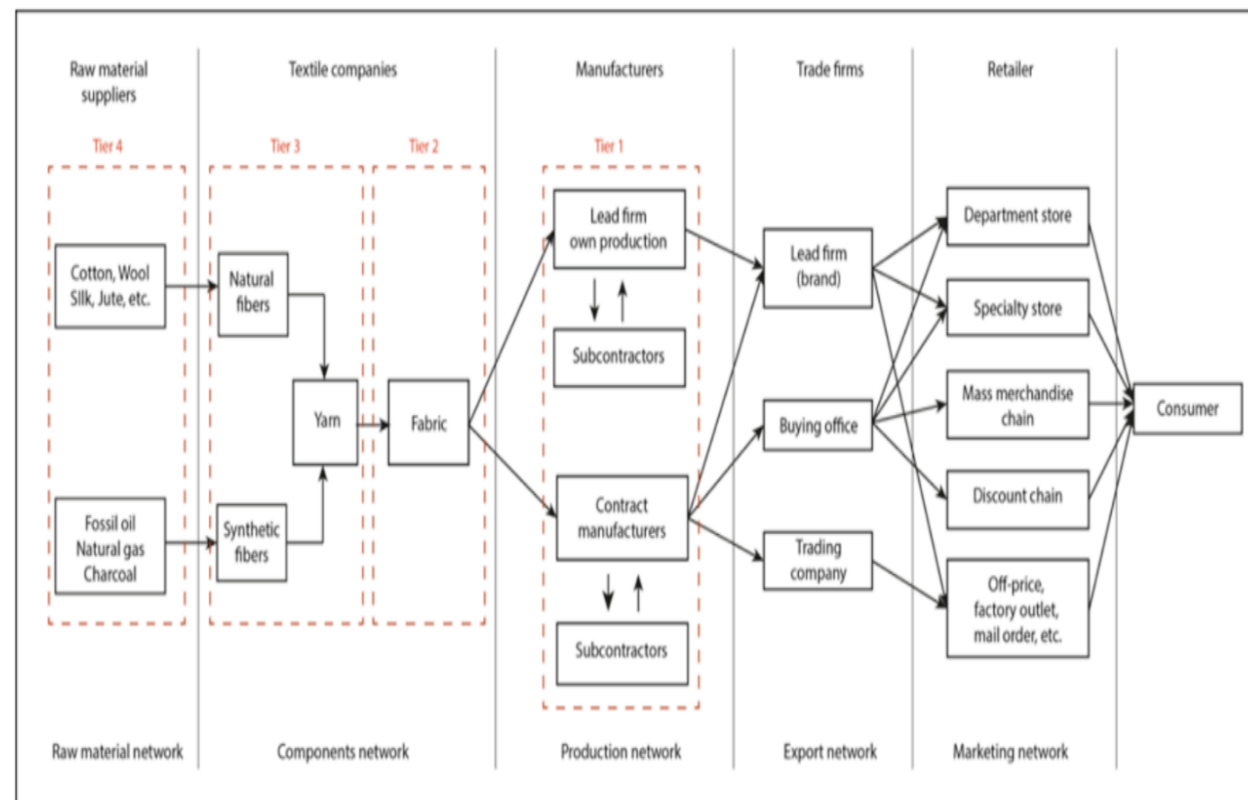
Implications on social and organizational aspects of production, e.g. conditions of work and employment, workers' autonomy, industrial relations, organization of work at shopfloor level.

Technological advances in apparel and footwear manufacturing

For the foreseeable future, new and old production systems will coexist.

Usage and availability of new technology varies across the different stages of the supply chain.

Focus on apparel and footwear manufacturing which remains labour-intensive.



Automation technologies already in place in textile production, incl. spinning, dying, weaving, knitting, etc.

Automation not yet pervasive in **manufacturing:** research focus.

Widespread technologies, incl. in both distribution and retail.

► Technological developments but challenges remain

Labour concentrated in sewing but a challenge to automate.

About 2/3 of workers, and 20-30% of costs in developing Asia and US.

Tech developers adopt various strategies but automation at scale still challenging:

- Softwear Automation: precision sensors to guide automated sewing;
 - Maica: semi-automation with fabric handling by workers;
 - Grabit: electroadhesion to arrange pieces for footwear uppers.
- Decisions on adoption of technology are multidimensional, e.g. relative cost, speed to market, quality, environmental sustainability.
 - Project countries adopted various strategies and policies for tech upgrading.



Project countries: Germany, Indonesia, Mexico, Romania and Spain

Heterogeneous group of countries

Selected due to differences in specialization and position in GSC, and wide geographic coverage.

Exports and employment, 2020

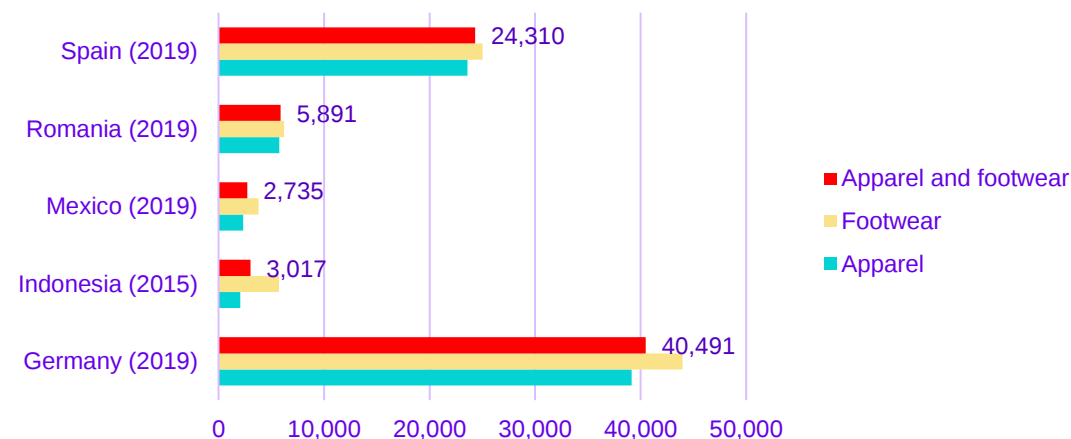
	Rank in 2020 global exports	Exports in 2020 (US\$ million)	Share of global exports (%)			Employment (000)	
			2000	2010	2020	2010 or closest^	2020 or latest*
Germany	4	32,305	3.2	4.7	5.5	100	71
Spain	10	14,847	1.5	2.2	2.5	112	94
Mexico	26	3,887	3.5	1	0.7	1,086	1,036
Indonesia	11	12,851	2.5	2	2.2	2,832	2,974
Romania	30	3,117	1.2	1	0.5	315	254

Note: Apparel and footwear exports refer to SITC 84 and 851; apparel employment refers to ISIC Rev 3 14 and 15.

*Indonesia (2015), Mexico (2019). ^Indonesia (2012).

Source: Exports from UNCTADTSTAT database, "Merchandise trade matrix in thousand United States dollars, annual", accessed 20 Aug 2021. Employment data from ILOSTAT database, "Employment by sex and economic activity - ISIC level 2 (thousands)", accessed 30 July 2021.

Apparel and footwear value added per employed person, latest available year (current US\$)



Note: Labour productivity defined as value added at factor values in current US\$ per person employed. Value added refers to ISIC Rev.3 groups 18 and 19; employment refers to ISIC Rev. 4 groups 14 and 15.

Source: Estimates based on value added data from UNIDO INDSTAT 2 - 2021 edition at the 2-digit level "Value added at factor values, US\$" and employment data from ILOSTAT database, "Employment by sex and economic activity - ISIC level 2 (thousands)", accessed 30 July 2021.

► Employment in apparel and footwear varies widely across countries

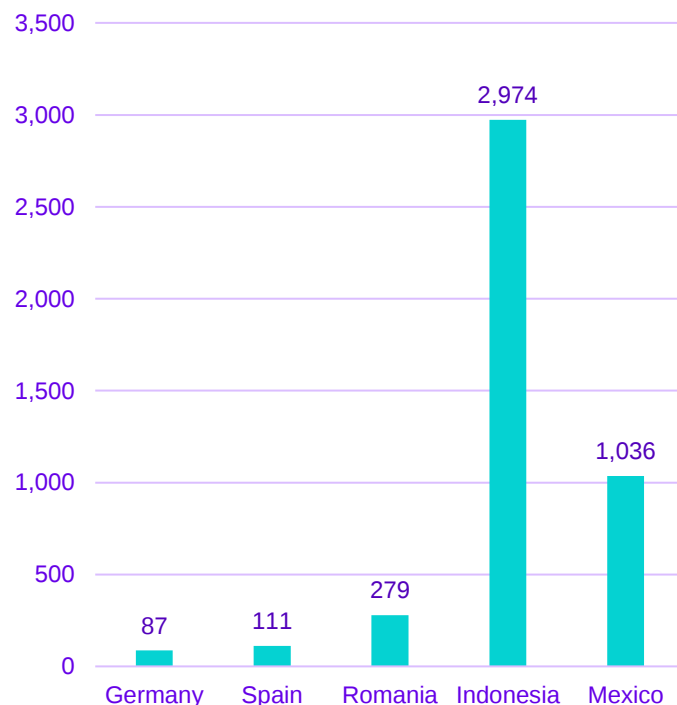
Still, women are the majority of workers and overrepresented relative to total and manufacturing employment.

- Romania: Sector accounts for up to 33% of women's mfg. emp. and 6% of total emp.
- Mexico: Sector accounts for 17% of women's mfg. emp 3% of total emp.

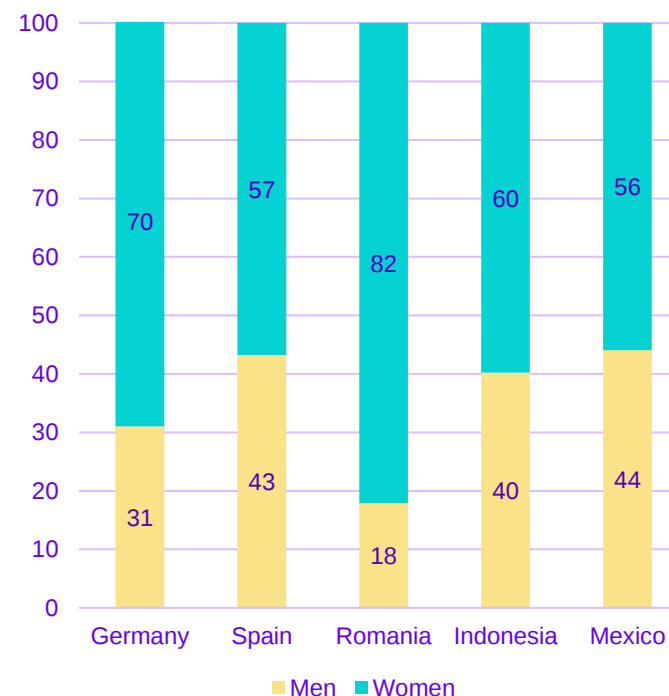
Apparel and footwear	Manufacturing	Total
56%	37%	39%

Employment in apparel and footwear, 2019 or latest

Employment (000)



Distribution of employment by sex (%)

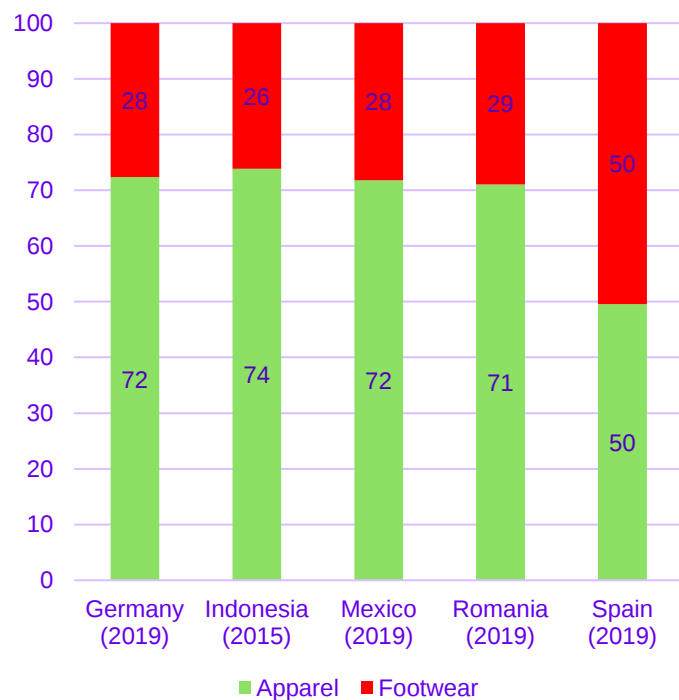


Note: Apparel and footwear refer to ISIC Rev. 3 groups 14 and 15. Indonesia (2015).

Source: Estimates based on employment data from ILOSTAT database, "Employment by sex and economic activity - ISIC level 2 (thousands)", accessed 30 July 2021.

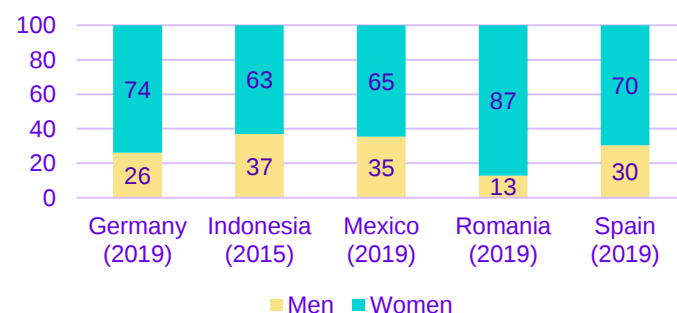
Comparing the distribution of employment by subsector and sex

Employment by subsector, 2019 or latest (%)

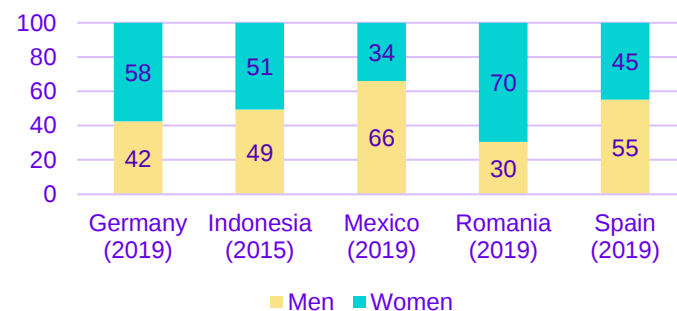


Employment by sex, 2019 or latest (%)

Apparel



Footwear



Apparel is the larger employer.

Women are particularly overrepresented in apparel, where V/A worker is lower than in footwear manufacturing.

► Difference in women's share ranges from 12pp in Indonesia to 31pp in Mexico.

Note: Apparel and footwear refer to ISIC Rev. 3 groups 14 and 15. Indonesia (2015).

Source: Estimates based on employment data from ILOSTAT database, "Employment by sex and economic activity - ISIC level 2 (thousands)", accessed 30 July 2021.

► Summing up and next steps

Change is most often incremental rather than a sudden radical transformation, and although some technological advances have been made, challenges remain.

Critical questions:

- Technological upgrading/automation and associated impacts on jobs in apparel and footwear manufacturing?
- Potential defeminization of the workforce which often accompanies increases in capital intensity and productivity and underlying causes?
- How will decent work deficits and gender gaps which characterize the industry today be changed by technological upgrading/automation??

Next steps: In-depth case studies built upon semi-structured interviews with employers, workers and other key informants.



Thank you