May 2023

Measuring labour force participation in Global Value Chains by gender: who depends on whom?

By Ricardo Chiapin Pechansky[*,**], Norihiko Yamano[*], and Peter Horvát[*]

* OECD, Paris, France ** University of Paris 1 Panthéon-Sorbonne, Paris, France

Abstract:

Improving women's economic empowerment requires policy action across a wide range of areas, including participation in international trade. Although trade policies are not in themselves discriminatory, they can impact women and men differently due to initial conditions, such as the distribution of employment across economic activities. Development of indicators of 'Trade in employment by gender' to analyse the impacts of trade can contribute to policy discussions related to women's involvement in the global economy. The OECD publishes a set of Trade in Employment (TiM) indicators, developed to provide broad insights into the impact of global value chains (GVCs) on labour markets. This is achieved by combining employment by industry statistics with OECD's Inter-Country Input-Output (ICIO) tables. By exploiting detailed survey data from various sources such as Labour Force Surveys, economic and population censuses, business surveys, and using a similar methodology, we extend these indicators to investigate the effects of participation in GVCs on employment *by workforce characteristics*: age, gender and skills. In this analysis we focus on the gender dimension. The paper describes the sources, limitations and methods used to develop internationally comparable harmonised estimates of employment by industry and gender, for 43 countries (all 38 OECD and five non-OECD EU countries) covering the period 2008 to 2018, and how they are applied to ICIO tables to produce indicators of trade in employment by gender. We present results for number of jobs and compensation of employees by industry, split by gender. We find that, in general, across OECD countries, men participate more directly in GVCs, via employment in manufacturing sectors while women tend to be more indirectly linked to GVCs, via greater representation in upstream service sectors. However, there are some exceptions where female workers are more directly linked to foreign demand, such as in tourism-oriented sectors (hotel, restaurants, and recreation services) and business services. The TiM indicators by workforce characteristics (gender) offer policymakers insights for understanding the detailed economic impacts of trade and industry policies and can contribute to policy discussions related to women's economic opportunities in global value chains.

Keywords:

Gender; Global Value Chains; Employment; Inter-Country Input-Output

1. Introduction

Gender is one of the most discussed and analysed forms of inequality in recent literature, with a growing number of studies focussing on disparities in salaries and participation of the two sexes in the labour market. The share of female employment in comparison to male employment, as well as labour compensation disparities, constitute reliable indicators of the gender gaps that have been widely discussed in recent years (Korinek et al., 2021; Rueda-Cantuche et al., 2019; Benz and Johannesson, 2019, Olivetti, and B. Petrongolo, 2016, among others). In this context, female representation in the workforce is still one of the central points of discussion in the agenda for gender equality, as specified by goal number 5 of the United Nations' Sustainable Development Goals (SDGs).

Improving women's economic empowerment requires policy action across a wide range of areas, including gender inequalities in participation and decision-making roles in international trade activities. Although trade policies themselves are not inherently discriminatory, they can impact male and female employment differently due to initial conditions, such as the distribution of employment across economic activities (Korinek et al., 2021). Some sectors may have a higher proportion of female workers compared to others. In most countries, industries such as education, financial services, tourism-oriented sectors, and healthcare have a relatively high share of female employment compared to male-dominated industries such as mining, manufacturing, construction, and transportation services (Horvát and Yamano, 2019). This paper aims to help shed light on this discussion by providing and analysing a novel dataset combining trade and employment by gender within an Input-Output framework.

Employment impact analysis has been a common application of Input-Output databases (Miller and Blair, 2009). Job dependency structures can be compared across countries using the harmonised Input-Output tables and corresponding employment vectors (Valadkhani, 2005; IDE-JETRO, 2006; De Backer and Yamano, 2007). Following the framework of Inter-Country Input-Output analysis such as measurement of Trade in Value Added (TiVA) (OECD, 2021a), there have been multiple efforts to analyse the impacts of foreign demand, both direct and indirect, on domestic employment (Alsamawi et al., 2014; Los et al., 2015; OECD, 2016; OECD, 2017; Portella-Carbó (2018); Horvát et al., 2020). They provide insights on the impacts of changing patterns of international trade on sectoral employment and compensation of employees (Horvát et al., 2020) sustained by foreign demand. Additional studies have extended the employment impacts into workforce characteristics such as gender (IDE-JETRO, 2006; Benz and Johannesson, 2019; Rueda-Cantuche et al., 2019), age and skills (Timmer et al., 2013; Horvát and Yamano, 2019).

To better understand the employment impacts of trade and industrial policies with the evolution of global production networks, the Organisation for Economic Co-operation and Development (OECD)

has developed a set of Trade in Employment (TiM) indicators (Horvát et al., 2020; database available at http://oe.cd/io-emp). One notable feature of this ICIO-based employment analysis is the use of "firm heterogeneity extended" ICIO tables. As Michel and Hambÿe (2021) note, firm heterogeneity-extended input-output tables can contribute to the overall quality of, for example, estimates of jobs sustained by foreign demand.

National Accounts statistics are designed to provide a consistent picture of labour input, value added and gross output by sector, even for relatively detailed industries. Labour Force Surveys (LFS) and census data are used only indirectly in this analysis to attribute shares of female employment by industry to apply to industry employment from National Accounts from the most aggregate industries down to the more detailed industry level of the ICIO tables.

Trade in Employment Indicators are derived by combining employment by industry (Horvát et al., 2020) with the 2021 edition of OECD's ICIO tables (OECD, 2021b), currently containing 45 industries. By exploiting detailed survey data from various sources such as National Accounts, LFS, Economic and population censuses, Business surveys, and using a similar methodology, we extend these indicators to investigate the effects of participation in GVCs on employment by workforce characteristics, focusing here on the gender dimension at a more aggregated industry level containing 12 unique industries.

This paper describes the sources, limitations and methods used to develop internationally comparable harmonised estimates of employment by industry and gender, for 43 countries (all 38 OECD and five non-OECD EU countries) covering the period 2008 to 2018, and how they are applied to the industry dimension of ICIO tables to produce indicators of trade in employment by gender. We present results for the number of employment and compensation of employees by industry (for selected economies) engaged in international trade, split by gender.[1]

The next section describes the methodology and data used to estimate the employment sustained by global production networks. The third section provides the results of employment and compensation of employees sustained by foreign demand. The last section summarises the empirical findings of the target economies and list the opportunities of the future extensions.

[1] Yet, Additional analysis is required to incorporate the gender-gap of unpaid family member employment and part-time employees (IDE-JETRO, 2006; Schaffer, 2007).

2. Data sources and estimation

The main challenge with measuring women's or men's participation in Global Value Chains (GVCs) is the limited information on employment by gender. Almost all sources with gender information were not designed for detailed industry-level analysis, which is necessary for the exploratory analysis of employment and GVCs. Estimates of domestic employment for 43 countries and compensation of employees for all 27 European Union countries, by industrial activity, used in this study are sourced from the Trade in eMployment (TiM) database, which prioritises National Accounts compatible statistics of employment and compensation of employees.

The sources for employment and labour compensation shares by gender are the following:

1. European Labour Force Survey (EU-LFS) for **European countries**:
    a. 2-digit ISIC Rev. 4 industry level for measures in persons (EU27, Iceland, Norway, Switzerland, Türkiye and the United Kingdom), or
    b. the A21 (ISIC Rev. 4's *A* through *U*) industry aggregation of average annual gross wages (EU27) by industry and gender;
2. National Employment Survey for **Chile**;
3. National Survey of Occupation and Employment (ENOE), population 14 years and older for **Mexico**;
4. Current Population Survey (CPS) for the **United States**: detailed 4-digit industry Census codes (which closely mirror NAICS), converted to 2-digit ISIC Rev. 4. Any missing industry employment by gender data was removed from the dataset (i.e. no imputations were made); and
5. Labour force survey (LFS) for other target countries, namely **Australia**, **Canada**, **Colombia**, **Costa Rica, Israel, Japan, Korea** and **New Zealand**.

Labour Force Surveys (LFS) and National Accounts employment statistics differ even at the total industry level. LFS estimates are based on household surveys where surveyed units correspond to households. The sample size of LFS is a fraction of the total number of households (e.g. 50,000 households in some EU countries). The primary purpose of LFS surveys is to provide insights into a population's activity: employed, unemployed or inactive. On the other hand, National Accounts statistics aim to provide a comprehensive, coherent, and internationally comparable summary of a country's economy and structure. TiM's employment by industry time series is compiled with national accounts using harmonized sources and surveys, often drawing on LFS for estimates of the self-employment. Information on employment by industry is also often drawn from Structural Business

Statistics (SBS)[2] or industry surveys and economic censuses, which (as far as possible) cover all firms or a relatively large sample of firms (either establishments or enterprises) above a certain threshold, complemented with smaller samples from the rest.

In the case of LFS, by disaggregating the results by the industry dimension, we may decrease the corresponding sample size as the stratification is not usually conducted by industry. Time series for some small countries, small industries and individual's characteristics, even if it entails only two survey options (e.g. gender), often show random drops and spikes caused by relatively small sample sizes. Those consist of a few individuals. For example, the EU-LFS[3] contains some missing industry data, mainly for more detailed target small industries, e.g. industry detail for mining by gender. These were filled either by calculating the missing detail or extrapolated using cubic splines. This also justifies a higher level of industry aggregation, so that these multi-dimensional samples are not too small and therefore less reliable (Annex 1).

Another distinction between the two sources is the employment measure itself. Household survey employment data are measured in persons because that is the smallest unit of the household. However, a person can have multiple jobs in different companies; thus, household surveys are often the only source on workers with multiple jobs information. On the other hand, business surveys' employment measures can also be in jobs or persons. But surveyed firms usually have only information on multiple jobs of their own employees within the firm but do not have any information if their employees work for other firms, which can lead to double counting of persons.

National Accounts statistics are designed to provide a more consistent picture, even for relatively detailed industries. For this reason, LFS data are used only indirectly to attribute shares by industry to employment by industry statistics from National Accounts - using a top-down approach from most aggregate industry down through the TiM industry hierarchy (see Annex B). This means, for example, that the total employment share by attribute from LFS was applied to the total industry level, thus taking into account the maximum sample size from LFS in the first step. In the next step, LFS shares were applied to the next level within the STAN industry hierarchy: *Agriculture, forestry and fishing* (ISIC Rev.4 Divisions 01 to 03), *Mining, manufacturing and utilities* (05 to 39), *Construction* (41 to 43), *Business sector services* (45 to 82) and *Public administration, education and health, social and personal services* (84 to 98).

The alignment of estimates with (sub) total industry-level characteristics was ensured using a bi-proportional balancing procedure. Figures calculated using LFS shares served as the initial matrix to the procedure as well as the peer industry totals from SNA, STAN or TiM database and the parent industry shares by characteristic as column and row totals, respectively. The process continued

[2] An example being Eurostat's SBS (https://ec.europa.eu/eurostat/web/structural-business-statistics).
[3] For more information on EU-LFS sampling design, please refer to this link.

hierarchically until the most detailed level of target industries was reached. An example of the input matrix to the RAS procedure is shown in Table 1.

The compensation of employees input matrix is obtained similarly, only including the multiplication of average compensation per employee from Eurostat's Structure of Earning Survey, 2018 round, by the number of employees from EU-LFS. In cases where average compensation per employee by industry information was missing, the average of the parent industry was applied to peer industries. The results then served as the initial values for the bi-proportional balancing procedure.

Table 1. RAS input matrix example for mining detail industry by gender

Industry	**Female**	**Male**	**Total**
D05T06	$EMPN_F^{LFS}$	$EMPN_M^{LFS}$	$\boldsymbol{EMPN_T^{SNA}}$
D07T08	$EMPN_F^{LFS}$	$EMPN_M^{LFS}$	$\boldsymbol{EMPN_T^{SNA}}$
D09	$EMPN_F^{LFS}$	$EMPN_M^{LFS}$	$\boldsymbol{EMPN_T^{SNA}}$
D05T09 (total)	$\boldsymbol{EMPN_F^P}$	$\boldsymbol{EMPN_M^P}$	$\boldsymbol{EMPN_T^{SNA}}$

Note: $EMPN_a^{LFS}$ is the initial value of employment from LFS and attribute *a*, which can has variations: male (M), female (F) and total (T), $EMPN_a^P$ represents the result of the previous adjustment and the $EMPN_a^{SNA}$ is the corresponding value from the TiM database, which is mostly sourced from SNA data. Last column and row are the column and row totals for the RAS procedure.

Table 2 below shows dimensions and descriptions of variables obtained from the OECD's ICIO Database.

Table 2. Variables description

Variable	Dimension	Description
PROD	$1 \times (k*n)$	Gross output vector by country and industry
$\mathbf{LABR}_a$	a × (*k***n*)	Compensation of employees matrix by country, industry and attribute from the RAS procedure
$\mathbf{EMPN}_a$	a × (k*n)	Employment matrix by country, industry and attribute from the RAS procedure
$\mathbf{e}^a$	a × (*k***n*)	Employment or labour compensation coefficient matrix by country, industry and attribute, calculated as $\mathbf{e}^a = \frac{\mathbf{EMPN}_a}{\mathbf{PROD}}$ or $\frac{\mathbf{LABR}_a}{\mathbf{PROD}}$
$\widehat{\mathbf{e}^a}$	(a*k*n) × (*k***n*)	Diagonalised employment coefficient matrix
A	(*k***n*) × (*k***n*)	Global Input coefficients matrix, calculated as $A_{i,j} = \frac{Z_{i,j}}{PROD_j}$
B	(*k***n*) × (*k***n*)	Global Leontief inverse matrix: $\mathbf{B=(I-A)^{-1}}$
y	(*k***n*) × *k*	Global final demand matrix showing the demand of country p (in a column) for goods and services from industry *i* in country *c* (rows)
GRTR	(*k***n*) × *k*	Global bilateral gross trade matrix by exporting country and industry to importing country for total goods and services

Source: OECD Inter-Country Input-Output (ICIO) database, 2021, http://oe.cd/icio.
Note: *k* is the number of countries, *n* is the number of industries and *a* is the number of attributes

Domestic employment, and compensation of employees, sustained by foreign final demand (FFD) by characteristics is then calculated as below, where *c* is country of production (employment), *a* is workforce characteristic, *i* is industry of production and *p* is partner (country of final demand):

$$\mathbf{FFD}_{c,a,i,p} = \widehat{\mathbf{e}^{a}} \times \mathbf{B} \times \mathbf{y} \quad (1)$$

Domestic employment, and compensation of employees, embodied in exports by characteristics estimated as below, where *c* is country of production (employment), *a* is workforce characteristic, *i* is exporting industry and *p* is importing partner:

$$\mathbf{EXGR}_{c,a,i,p} = \widehat{\mathbf{e}^{a}} \times \mathbf{B} \times \mathbf{GRTR} \quad (2)$$

It is important to understand that TiM's EXGR_DEM (domestic employment embodied in gross exports) is composed of the sum of direct (EXGR_EMD, the exporting industry *i*) and indirect (EXGR_EMI, the sum of upstream domestic industries supplying inputs to industry *i*) employment. This means that the share of a given industry *i*'s EXGR_DEM over its total employment can go over 100%, since it accounts for workers in upstream industries as well. The same logic applies to labour compensation embodied in gross exports. Direct and indirect employment embodied in gross exports are defined as follows:

$$\mathbf{EXGR\_EMD}_{c,a,i,p} = \widehat{\mathbf{e}^{a}} \times \mathbf{diagB} \times \mathbf{GRTR} \quad (3)$$

where **diagB** consists of the diagonal elements of the local Leontief inverse matrix **B**, with zeros in the off-diagonal cells, displaying the direct requirements.

$$\mathbf{EXGR\_EMI}_{c,a,i,p} = \widehat{\mathbf{e}^{a}} \times \mathbf{offdiagB} \times \mathbf{GRTR} \quad (4)$$

where **offdiagB** represents the local Leontief inverse matrix **B** with zeros in all diagonal elements, displaying the indirect requirements.

3. Results

This section provides descriptive statistics analysing Trade in Employment. It focuses on indicators reporting employment and labour compensation (compensation of employees) embodied in gross exports for OECD and, for the latter, EU countries only. In doing so, it provides further evidence of disparities in the context of gender in the labour market, particularly in the subset of employment that relies on trade.

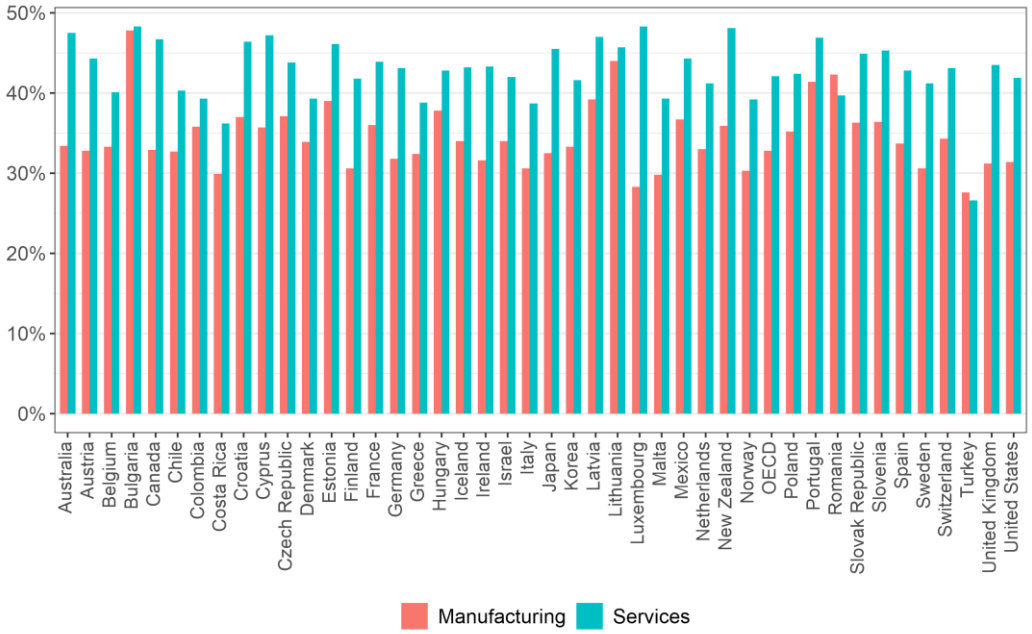
3.1 Employment supported by trade

It is well documented that, despite being underrepresented in many sectors across OECD economies, women are relatively more present in the services sector. TiM data further validates this: OECD countries employ 23 million women in the manufacturing sector (approximately 30% of the sector's workforce) against 245 million in the services sector (over half of the sector's workforce). However, there is less evidence of how or if these ratios hold in the context of the subset of employment which is embodied in trade. Incidentally, as trade openness and global linkages have strong distributional consequences, understanding where men and women are more exposed to trade has particular implications for policymaking.

Our results reveal that women are, in general, less represented in trade-related employment than men, but also when compared to female general employment. For all OECD countries, the percentage of female participation relative to men in services is significantly smaller for employment embodied in gross exports (EEGX[4]). For the OECD average, it is 10 percentage points (pp.) smaller than for general employment. Conversely, it is slightly higher (3 pp.) in the context of manufacturing, indicating that female EEGX is more homogeneous across macro sectors than general female employment. However, for nearly all OECD countries the higher representation of women in services still holds for trade-related employment (Figure 1). These shares in the sector have remained fairly stable between 2010 and 2018, with the largest shifts towards a smaller gender gap in Malta and Turkey (increase in 5 pp.).

[4] EEGX corresponds to the EXGR_DEM code in the TiM database (see https://oe.cd/ds/io-emp-byc).

Figure 1. Percentage of female employment embodied in gross exports across countries, 2018

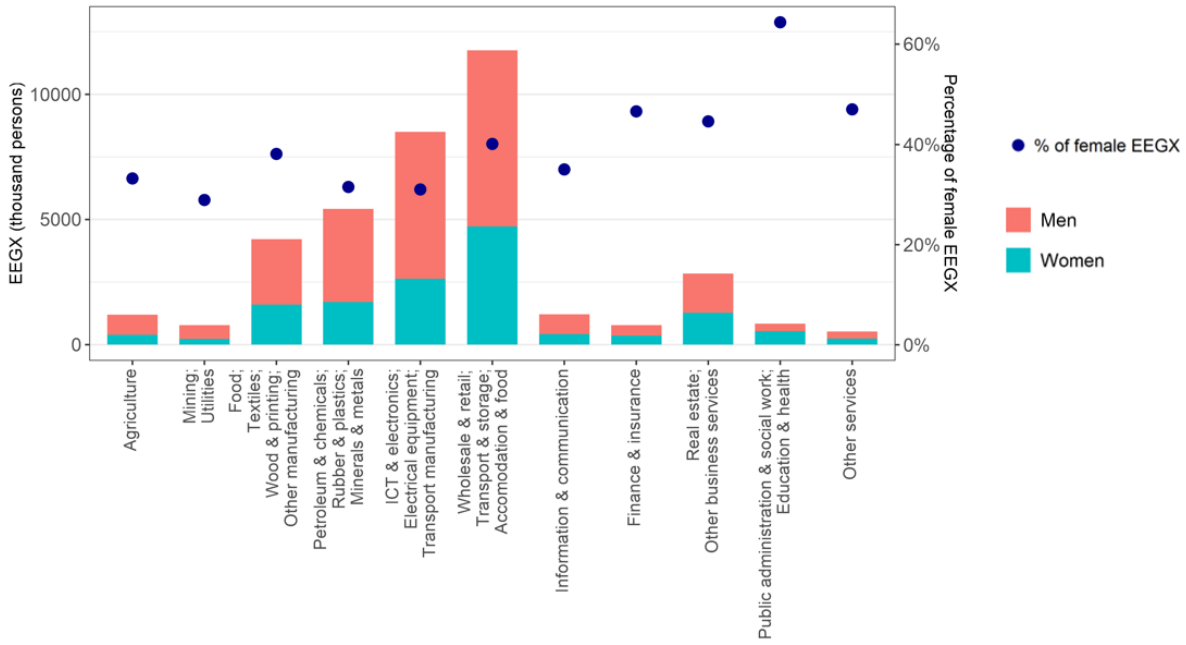


Source: Trade in employment by characteristics database, 2022, https://oe.cd/ds/io-emp-byc.

At the more detailed industry level, the pattern of more concentration of male trade-dependent employment in manufacturing and women in services is fairly homogenous. For the OECD aggregate, almost all services industries have higher shares of female EEGX than manufacturing industries (Figure 2). With the most women being employed in trade-reliant jobs within the aggregate sector *Wholesale & retail, transport & storage* and *accommodation & food services* (4.7 million jobs).

Consistently across OECD countries, *Public administration & social work* and *education & health* is the aggregate sector with one of the highest percentages of female EEGX, with more than 60% for most countries. The only exception, where women make up less than half of the sector, is Turkey (44%, still the highest percentage across Turkish sectors). As an industry with minimal trade exposure, the public administration & social work and education & health sector is an example of how women are less exposed to trade because of their higher presence in less or non-tradeable sectors.

Figure 2. Female employment embodied in gross exports (EEGX) across OECD industries, 2018

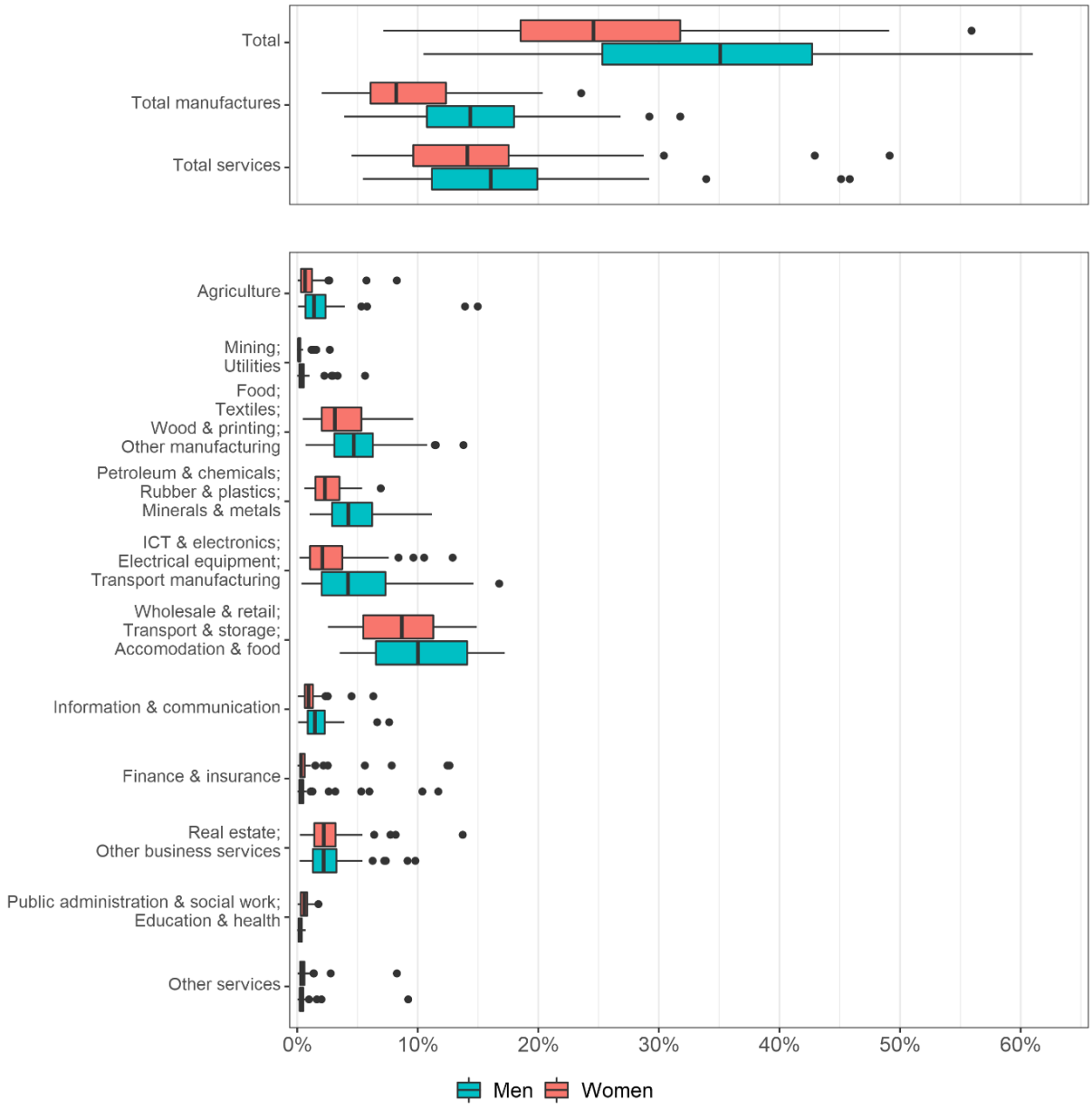


Source: Trade in employment by characteristics database, 2022, https://oe.cd/ds/io-emp-byc.
Note: OECD average.

Although there are more male workers relying on trade than their female counterparts, this is at least partly due to men making up a larger share of the workforce in almost all analysed countries. However, across most countries, the shares of male employment also tend to be higher in sectors with stronger export dependence, meaning that a larger share of male workers rely on trade compared to their female counterparts.

On average, about 30% of male employment is supported by exports, of which about 15% in services, 14% in manufacturing and 1% in agriculture. For women, a lower figure of 25% of employment is on average supported by exports, mainly stemming from lower dependence on manufacturing, about 8%. Evidently, the lesser relative importance on manufacturing is not related to its lower export intensity, as it is much more export-intensive than services, but rather because TiM countries are mainly developed economies with lower shares of labour in manufacturing. As seen, this especially true for women.

Figure 3. Employment embodied in gross exports as a share of country employment, by industry and gender



Source: Trade in employment by characteristics database, 2022, https://oe.cd/ds/io-emp-byc.
Note: Distribution across all 43 TiM countries. Based on EEGX and employment indicators, where shares are calculated as following: for country c, industry i, and characteristic a, EEGXc,i,a/EMPNc,a. In the case of e.g. women, the share shows how many out of all female workers in country c are reliant on exports from industry i.

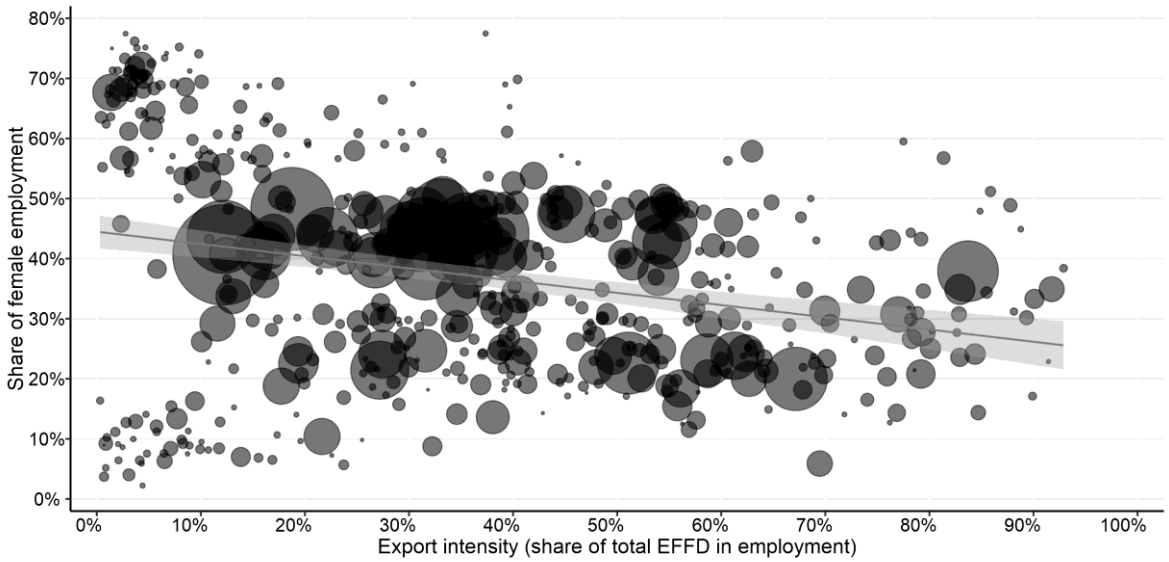
There is a correlation between female employment and industries which have lower export intensity, precisely because of women's higher relative presence in the services sector. This signals that men are more exposed to trade not only because they have a higher presence in employment sustained by trade in all but one of the analysed sectors, but also because they have higher presence in sectors where employment is relatively more embodied in trade. Figure 4 demonstrates this correlation using the share

of female employment and the share of employment that is meeting foreign final demand (EFFD[5]) as the indicator for reliance on trade. As a share of total employment, unlike EEGX, this indicator cannot go over 100%, since it accounts only for workers within the industry (no upstream employment), and the industry's linkages from the value-added perspective.

The share of female employment that is meeting foreign final demand has not significantly changed since 2012. The two sectors where the share of female EFFD vis-à-vis total employment has risen more significantly are *Food, textiles, wood & printing, and other manufacturing* (from 36% to 42%) and *Information and communication* (from 29% to 35%), signalling a relative increase in trade-sustained jobs in the context of female employment.

This raises another important characteristic of female employment embodied in trade. Table 3 shows that women participate more indirectly in GVCs than men. While this applies to the majority of OECD countries, the largest discrepancies are found in Chile (7 pp. difference between female and male indirect EEGX), Germany (5 pp.), and France, Finland, Israel and Korea (4 pp.). As mentioned, it signals the relatively large female employment in industries more upstream, notably services, which qualitatively changes the way this cohort is exposed to GVCs.

Figure 4. Correlation between share of female employment and industry export intensity, 2018



Source: Trade in employment by characteristics database, 2022, https://oe.cd/ds/io-emp-byc.
Note: Industries are 516 observations (12 unique industries x 43 countries). Size corresponds to the size of employment (male and female) embodied in meeting foreign final demand. Export intensity is measure as employment embodied in gross exports (both direct and indirect) over industry employment.

[5] EFFD corresponds to the FFD_DEM code in the TiM database (see https://oe.cd/ds/io-emp-byc).

Looking across sectors, women's relatively higher presence in indirect trade-reliant jobs than men is mostly in the manufacturing sector. In other words, the cohort's exposure to trade in manufacturing is not only smaller than that of men, but also significantly more indirect. As manufacturing sectors still contain a lot of female EEGX, this is of particular importance. The industry of *ICT & electronics, electrical equipment and transport manufacturing* has a discrepancy of over 15 pp. between women's and men's ratio of indirect-to-direct EEGX, and in this industry's female employment embodied in trade is 58% composed of indirect jobs. Another notable example is the *petroleum & chemicals, rubber & plastics and minerals & metals* industry, where the same discrepancy is over 13 pp. and where female EEGX is over 60% indirect.

Another interesting perspective on these statistics is looking into the gender-type of effect EEGX (e.g. female indirect EEGX) as a share of industry employment for that gender. Observing the highest shares (top 10%) across country-industry pairs, through frequency analysis one can see which industries are consistently showing high shares of EEGX. For all gender-type of effect pairs (female direct, male direct, female indirect and male indirect), the industry consistently exhibiting high shares of employment is *ICT & electronics, electrical equipment, and transport manufacturing*. In 2018, it has represented over 40% of all top shares of employment, both direct and indirect and for both genders.

Table 3. Employment sustained by exports, by type of effect, gender and country, 2018, in thousand persons

Country	Women			Men		
	Direct EEGX	Indirect EEGX	% indirect	Direct EEGX	Indirect EEGX	% indirect
Australia	414	358	46%	611	623	50%
Austria	369	226	38%	638	306	32%
Belgium	361	264	42%	671	384	36%
Bulgaria	518	200	28%	669	258	28%
Canada	930	702	43%	1,531	947	38%
Chile	332	285	46%	734	465	39%
Colombia	594	400	40%	1,150	784	41%
Costa Rica	134	56	30%	301	141	32%
Croatia	176	69	28%	230	99	30%
Cyprus	41	23	36%	47	31	39%
Czech Republic	550	367	40%	895	540	38%
Denmark	203	114	36%	367	186	34%
Estonia	81	35	30%	108	50	32%
Finland	127	107	46%	247	175	41%
France	1,439	1,091	43%	2,261	1,476	39%
Germany	2,532	2,052	45%	4,816	3,238	40%
Greece	277	139	33%	485	233	32%
Hungary	535	246	32%	850	341	29%
Iceland	18	8	31%	27	15	35%
Ireland	300	126	30%	484	212	30%
Israel	216	104	32%	358	145	29%
Italy	1,090	956	47%	2,235	1,787	44%

Japan	2,045	1,521	43%	3,487	2,333	40%
Korea	986	1,260	56%	1,914	2,077	52%
Latvia	91	45	33%	123	61	33%
Lithuania	147	71	33%	192	86	31%
Luxembourg	86	31	26%	111	35	24%
Malta	28	19	40%	47	32	40%
Mexico	1,984	1,325	40%	3,301	2,311	41%
Netherlands	858	514	37%	1,444	778	35%
New Zealand	143	107	43%	194	157	45%
Norway	106	72	40%	201	134	40%
Poland	1,324	827	38%	2,214	1,333	38%
Portugal	468	234	33%	581	327	36%
Romania	711	344	33%	1,005	488	33%
Slovak Republic	272	141	34%	423	217	34%
Slovenia	122	61	33%	183	89	33%
Spain	1,137	850	43%	1,901	1,280	40%
Sweden	314	183	37%	571	310	35%
Switzerland	408	272	40%	662	400	38%
Turkey	1,014	563	36%	2,561	1,432	36%
United Kingdom	1,788	936	34%	2,578	1,468	36%
United States	3,373	2,153	39%	5,506	3,623	40%

Source: Trade in employment by characteristics database, 2022, https://oe.cd/ds/io-emp-byc.

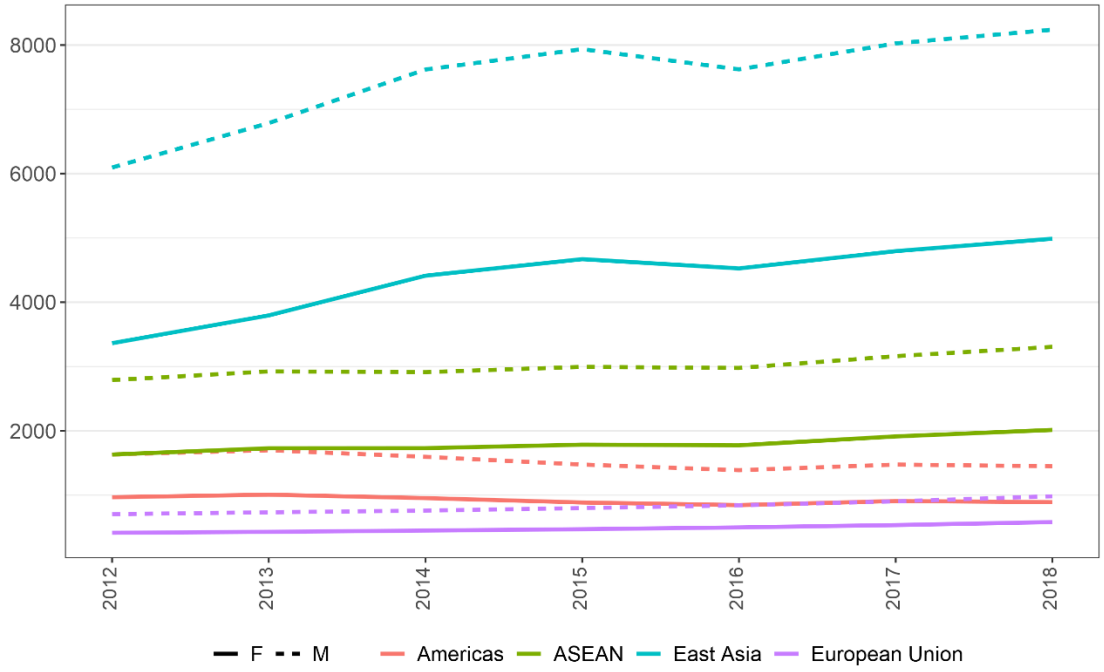
For indirect EEGX in particular, which involves other upstream activities, female employment is also strongly concentrated in supporting another manufacturing industry: *petroleum & chemicals, rubber & plastics and minerals & metals* (over 35% of top shares of female indirect EEGX). In other words, over 80% of the highest shares of female indirect EEGX across countries is composed just by this industry and *ICT & electronics, electrical equipment and transport manufacturing*. These are less concentrated for the male counterpart. A third major industry *(food, textiles, wood & printing, and other manufacturing*) also appears in 17% of top shares of male indirect EEGX.

These three manufacturing industries have consistently high frequencies in top gender-type of effect EEGX shares of industry employment. Which indicates that, across OECD countries, employment in these industries is among the most linked to GVCs. As sensitive industries when it comes to high shares of employment embodied in gross exports either directly or indirectly, they are of particular interest to understanding how any trade shock can percolate to domestic male and female employment.

Finally, observing OECD employment by partner regions (Figure 5), certain patterns can be highlighted concerning the gender divide. Between 2012 and 2018, OECD female EEGX outgrew male EEGX by 5 pp., but this growth has been heterogeneous in terms of the importing region on which this employment relies. The main partner is East Asia, which includes China, whose imports have seen a growth of 48% of OECD female EEGX (5 million workers) in the middle of the last decade, against 35% for male EEGX (8 million workers). While this caused the region to increase its importance in the

partner share of OECD employment embodied in trade, it has done so particularly for women. In 2018, 35.3% of OECD female EEGX relied on East Asia (8 pp. increase from 2012) next to 34.3% of OECD male EEGX (6.6 pp. increase). Currently, OECD women rely relatively more than men in the Americas, ASEAN countries and particularly East Asia (1 pp.). Conversely, men rely 1.7 pp. more on the "rest of the world", which in the context of the TiM database signals mainly smaller, non-OECD economies. These statistics signal that potential trade issues with Asian countries might affect women in the OECD slightly disproportionately, an example of the distributional consequences of trade in gender that should be considered in policymaking.

Figure 5. Evolution of OECD employment sustained by exports by gender and partner region, 2018, in thousand persons



Source: Trade in employment by characteristics database, 2022, https://oe.cd/ds/io-emp-byc.

These dependencies also vary across sectors, particularly for mining and manufacturing industries exporting to East and Southeast Asia. As previously mentioned, these are sectors where a higher share of female employment is sustained by exports relative to male employment. However, this higher relative dependence stems mainly from trade with Asian countries. In the case of *ICT & electronics, electrical equipment and transport manufacturing*, the differences between share of female EEGX over employment relative to men arise more significantly not with exports to the EU or the Americas, but to East Asia (6 pp.) and ASEAN (2 pp.). The situation is similar for *petroleum & chemicals, rubber & plastics and minerals & metals*, where 15.6% of OECD female employment relies on exports to East and Southeast Asia, relative to 10.3% of OECD male employment.

Table 4. Share of industry employment reliant on gross exports, by partner and gender, 2018

Industry	Total (World)		ASEAN		East Asia		European Union		Americas	
	F	M	F	M	F	M	F	M	F	M
Agriculture	4.8%	4.1%	0.4%	0.4%	1.4%	1.4%	0.4%	0.3%	0.1%	0.1%
Mining; Utilities	14.9%	7.9%	0.8%	0.4%	9.0%	4.7%	0.3%	0.2%	1.0%	0.5%
Food; Textiles; Wood & printing; Other manufacturing	13.4%	13.2%	1.5%	1.5%	3.9%	3.7%	1.0%	0.9%	0.6%	0.7%
Total manufactures	25.7%	22.1%	3.3%	2.8%	9.5%	8.0%	1.1%	0.9%	1.4%	1.1%
Petroleum & chemicals; Rubber & plastics; Minerals & metals	31.1%	20.8%	3.8%	2.6%	11.8%	7.7%	1.2%	0.9%	2.2%	1.4%
ICT & electronics; Electrical equipment; Transport manufacturing	46.6%	33.3%	6.6%	4.7%	19.2%	13.0%	1.5%	1.1%	2.1%	1.4%
Wholesale & retail; Transport & storage; Accommodation & food	6.8%	7.4%	0.9%	0.9%	2.4%	2.5%	0.2%	0.3%	0.4%	0.5%
Total services	3.1%	4.5%	0.5%	0.7%	1.0%	1.4%	0.1%	0.2%	0.2%	0.3%
Information & communication	8.2%	6.4%	1.6%	1.2%	2.0%	1.5%	0.6%	0.5%	0.9%	0.7%
Finance & insurance	4.0%	4.8%	0.9%	1.0%	0.5%	0.6%	0.2%	0.3%	0.2%	0.3%
Real estate; Other business services	3.4%	3.3%	0.9%	0.9%	0.8%	0.8%	0.1%	0.1%	0.3%	0.3%
Public administration & social work; Education & health	0.5%	0.6%	0.0%	0.1%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%
Other services	1.0%	1.8%	0.1%	0.2%	0.4%	0.7%	0.0%	0.1%	0.1%	0.1%
Total	5.0%	6.9%	0.7%	0.9%	1.8%	2.4%	0.2%	0.3%	0.3%	0.4%

Source: Trade in employment by characteristics database (2022) https://oe.cd/ds/io-emp-byc.
Note: Average for OECD countries. Partner regions are aggregations including the following economies: ASEAN is the 8 economies of Brunei, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam; East Asia is the 5 economies of China, Hong Kong, Japan, South Korea and Taiwan; and the Americas is the 9 economies of Argentina, Brazil, Canada, Chile, Colombia, Costa Rica, Mexico, Peru and the United States.

3.2 Labour compensation supported by trade

This section considers labour compensation indicators for the European Union, namely the share dependent on gross exports. Analysing across countries (Table 5), the higher dependence of women in services holds as truly for labour compensation as it does for employment. For both manufacturing and services, women have a smaller share of both general labour compensation and labour compensation embodied in gross exports (CEGX[6]). However, similarly to employment, in manufacturing women have a higher share of CEGX than they do general labour compensation. The situation is opposite in services, where general labour compensation is on average 11 pp. higher than CEGX, meaning gender disparities in labour compensation are also smaller in the context of trade reliance.

On average for EU countries, the percentage of women in services CEGX is 40%, ranging from 35% (Malta) to 44% (Slovenia). For manufactures, the average is 31%, ranging from 24% (Luxembourg) to 40% (Lithuania). Therefore, on average the EU has a share of women represented in services CEGX 9 pp. than in manufactures CEGX.

Table 5. Labour compensation sustained by exports, by macro sector, gender and country, in thousand persons

Country	Manufacturing		Services	
	Women	Men	Women	Men
Austria	10,747	30,041	14,416	22,323
Belgium	11,881	28,837	20,458	31,475
Bulgaria	1,976	2,930	2,318	3,134
Croatia	883	1,829	2,666	3,517
Cyprus	112	228	1,433	1,903
Czech Republic	9,892	21,667	5,483	8,674
Denmark	6,759	14,739	10,521	19,578
Estonia	896	1,689	1,474	1,934
Finland	4,875	13,118	5,696	9,486
France	47,158	102,953	74,887	111,748
Germany	112,917	323,144	88,613	138,542
Hungary	4,975	10,791	5,068	8,166
Ireland	8,429	18,867	16,017	23,879
Italy	35,876	99,818	26,998	45,557
Latvia	686	1,285	1,430	1,945
Lithuania	1,464	2,215	2,247	2,821
Luxembourg	710	2,214	7,030	10,751
Malta	114	329	990	1,801
Netherlands	15,421	42,132	37,066	63,554
Poland	13,140	30,018	12,942	19,344
Portugal	4,955	9,163	7,347	10,028
Romania	4,825	8,502	4,489	7,363
Slovak Republic	3,877	8,701	2,876	4,192
Slovenia	2,318	4,464	2,172	2,716

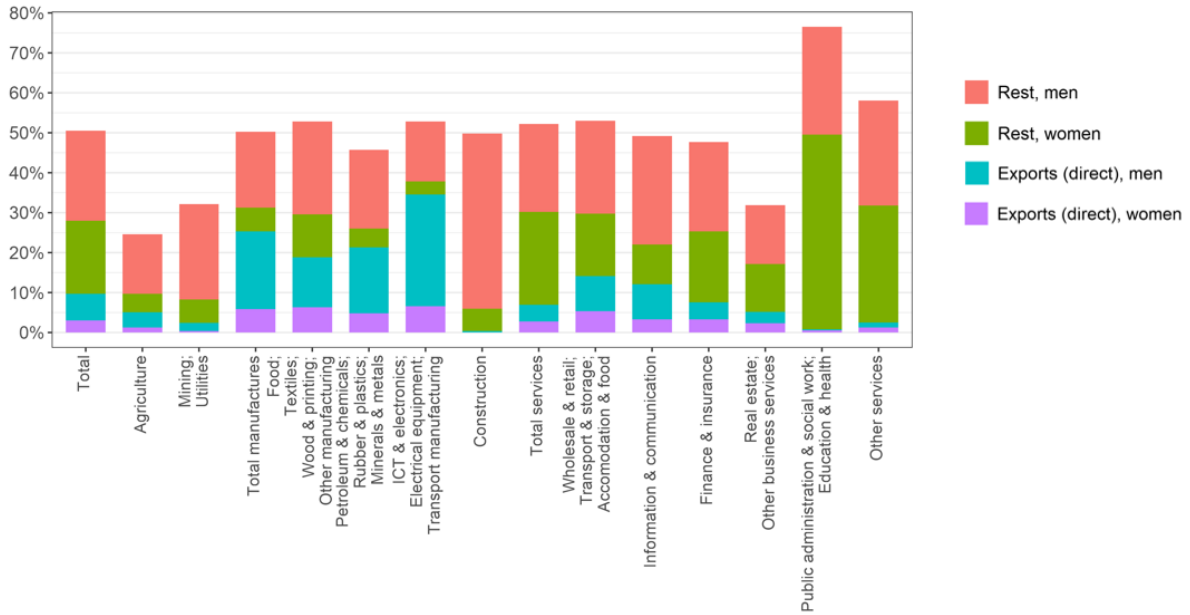
[6] CEGX corresponds to the EXGR_DCE code in the TiM database (see https://oe.cd/ds/io-emp). As an extension of TiM by characteristics, this data decomposed by characteristics is currently not available publicly.

Spain	20,144	49,906	34,881	55,317
Sweden	10,691	24,154	16,358	23,494

Source: Trade in Employment database, 2022 (https://oe.cd/tim) and author's calculations.

Identifying the labour compensation split as part of value added, the European Union presents interesting findings (Figure 6). In the EU, only 10% of value added (of which 3% women and 7% men) corresponds to the direct compensation of employees supported by exports, but the industry changes from the industry perspective, which is heterogenous. Manufacturing generally has a higher dependency on exports compared to services, both for women and men. Women's highest share of CEGX as a part of value added is in ICT & electronics, electrical equipment, and transport manufacturing (6.3%) and food, textiles, wood & printing, and other manufacturing (6%). Men have more than double the shares of women in total CEGX, and the cohort's much higher shares have their largest values in in ICT & electronics, electrical equipment, and transport manufacturing (28%) and petroleum & chemicals, rubber & plastics, minerals & metals (16%).

Figure 6. Direct labour compensation as a share of value added, by industry and gender, 2018



Source: Trade in Employment database, 2022 (https://oe.cd/tim) and author's calculations.
Note: Average for European Union, where exports and rest shares by gender are defined as the sum of CEGX / VALU and (LABR – CEGX) / VALU, respectively. Where VALU is value added.

Conversely, women's contribution to value added are more frequently not in direct CEGX, with an aforementioned higher presence in services less reliant on trade. Once again, the starkest example is public administration & social work and education & health, where female labour compensation not engaged in direct CEGX composes 48% of sectorial value added.

Further decomposing TiM data on direct and indirect labour compensation (Table 6) reliant on exports provides further evidence on women's higher relative reliance on indirect CEGX. Across all manufacturing industries, women have a much higher part of sectorial labour compensation represented by indirect CEGX than men. These discrepancies are starker than for employment, the ICT & electronics, electrical equipment and transport manufacturing being an important example: women (+21 pp.) have a 47 pp. higher ration indirect-to-direct CEGX than men (-26 pp.). This perspective contrasts with services, where men have a larger share of CEGX over total labour compensation both for direct and indirect CEGX, although all shares for services are significantly smaller than those for manufactures.

Table 6. CEGX as a share of total labour compensation, by type of effect and gender, 2018

Industry	Women		Men	
	Direct	Indirect	Direct	Indirect
Agriculture	20%	30%	20%	17%
Mining; Utilities	10%	13%	11%	7%
Food; Textiles; Wood & printing; Other manufacturing	35%	29%	33%	25%
Total manufactures	48%	55%	49%	32%
Petroleum & chemicals; Rubber & plastics; Minerals & metals	51%	62%	45%	31%
ICT & electronics; Electrical equipment; Transport manufacturing	64%	85%	64%	38%
Construction	1%	1%	1%	0%
Wholesale & retail; Transport & storage; Accommodation & food	24%	11%	25%	12%
Total services	11%	4%	16%	7%
Information & communication	25%	14%	24%	8%
Finance & insurance	19%	8%	22%	10%
Real estate; Other business services	17%	4%	18%	5%
Public administration & social work; Education & health	1%	0%	1%	0%
Other services	5%	1%	5%	2%
Total	14%	9%	22%	12%

Source: Trade in Employment database, 2022 (https://oe.cd/tim) and author's calculations.
Note: Average for European Union.

Finally, we analyse discrepancies among partners across countries (Table 7). It is clear that most EU countries' CEGX relies on OECD countries, a large share of which reflecting intra-EU trade. Regarding labour compensation embodied in foreign final demand as a share of total labour compensation, the EU average for women is of 23% as intra-OECD foreign final demand and 8% for non-OECD partners. Men, as a more integrated cohort in GVCs, have in the same context the shares of 30% and 11%, respectively. For most EU countries, women's labour compensation is relatively more reliant on OECD foreign final demand, with several countries exhibiting a 1 pp. difference and Croatia and Malta having the highest (2 pp.) discrepancies.

Table 7. Labour compensation embodied in foreign final demand as a share of total labour compensation, by partner and gender

Country	Women			Men		
	OECD	Non-OECD	% OECD	OECD	Non-OECD	% OECD
Austria	21.2%	6.9%	75%	30.6%	10.5%	74%
Belgium	21.1%	5.6%	79%	32.3%	9.3%	78%
Bulgaria	25.0%	11.7%	68%	28.8%	14.2%	67%
Croatia	23.1%	6.4%	78%	27.0%	8.4%	76%
Cyprus	19.5%	14.7%	57%	20.9%	15.5%	57%
Czech Republic	27.8%	7.3%	79%	37.6%	10.4%	78%
Denmark	17.6%	5.5%	76%	26.4%	8.8%	75%
Estonia	27.5%	8.1%	77%	36.0%	10.7%	77%
Finland	12.3%	6.5%	65%	21.0%	10.8%	66%
France	13.3%	5.6%	71%	18.2%	7.9%	70%
Germany	16.0%	6.6%	71%	25.3%	11.0%	70%
Hungary	26.6%	9.4%	74%	36.8%	13.2%	74%
Ireland	34.9%	11.0%	76%	49.1%	15.2%	76%
Italy	13.7%	5.8%	70%	19.8%	8.7%	69%
Latvia	20.9%	7.7%	73%	29.7%	10.4%	74%
Lithuania	24.0%	8.7%	73%	31.0%	11.2%	73%
Luxembourg	42.3%	10.4%	80%	49.6%	13.0%	79%
Malta	33.3%	14.1%	70%	39.2%	18.4%	68%
Netherlands	21.6%	7.3%	75%	32.6%	11.1%	75%
Poland	20.9%	5.9%	78%	30.0%	8.7%	78%
Portugal	19.3%	6.0%	76%	26.0%	8.3%	76%
Romania	18.5%	5.4%	77%	23.3%	7.4%	76%
Slovak Republic	29.0%	8.3%	78%	38.6%	11.1%	78%
Slovenia	26.4%	11.6%	69%	34.5%	15.7%	69%
Spain	15.8%	5.0%	76%	21.3%	7.2%	75%
Sweden	16.6%	5.5%	75%	25.3%	8.8%	74%

Source: Trade in Employment database (2022).
Note: Data for 2018. Percentage of OECD is its partner share of total CEGX.

4. Conclusions

In this study, we have aimed to analyse worker heterogeneity, namely gender, in the context of employment and compensation of employees supported by trade. By expanding on the OECD's Trade in Employment framework, we have produced a novel dataset which combines employment by industry and gender survey data (mostly Labour Force Surveys) with the existing firm heterogeneity extended ICIO to decompose employment and labour compensation data for 12 industries and for 43 (employment) and 27 (labour compensation) countries. By expanding on well-established and reviewed data, it provides new robust estimates for indicators supporting the gender and trade literature.

According to our measures, we provide further evidence that women are more present in the services sector, which, being traditionally less tradeable than manufacturing, means they have a different form of interaction with GVCs than men. Where manufacturing exports sustain most male employment directly, they sustain female employment indirectly through upstream linkages. For example, the industry of *ICT & electronics, electrical equipment and transport manufacturing* has a discrepancy of over 15 pp. between women's and men's ratio of indirect-to-direct EEGX. In terms of the evolution of female employment sustained by trade, we have shown that, in terms of the share of female employment that is meeting foreign final demand, the structure has remained stable. The two more notable exceptions are the industries of are light industry (*food, textiles, wood & printing, and other manufacturing*) and *information and communication*, which have both seen a 6 pp. increase of female EFFD relative female employment, signalling a relative expansion of trade-related employment.

Because of these sectorial differences between male and female employment, dependencies among trade partners also differ. Between 2012 and 2018, OECD female EEGX outgrew male EEGX sustained by exports to East Asia, which includes China (48% vs 35% increase, respectively). Currently, 35.3% of OECD female EEGX relies on East Asia, 1 pp. more than their male counterparts. Conversely, men rely 1.7 pp. more on the "rest of the world", which in the context of the TiM database signals mainly smaller, non-OECD economies. These statistics reveal how potential trade issues with different partners might affect subsets of employment differently, linking to the distributional consequences of trade that motivate this study. We have also shown that, for the EU average, 23% of female workers' labour compensation is embodied in OECD foreign final demand and 8% for non-OECD partners. As a more integrated cohort in GVCs, male shares are higher at 30% and 11%, respectively.

To further develop the present discussion, it is also important to expand the country coverage of this paper. Women in developing countries often face additional challenges to economic opportunities. For example, barriers include access to education, poor working environment in assembly factories, opportunities for entrepreneurship, and discriminatory practices. Therefore, generating employment and compensation indicators for developing countries is important for increasing the potential for economic growth and development, and can be a future extension of this study.

References

Alsamawi, A., Murray, J. and Lenzen, M. (2014). The Employment Footprints of Nations. *Journal of Industrial Ecology*, 18: 59-70.

Benz, S. and Johannesson, L. (2019). Job characteristics, job transitions and services trade: Evidence from the EU labour force survey, *OECD Trade Policy Papers*, No. 225, OECD Publishing, Paris, http://dx.doi.org/10.1787/bb21f81a-en.

De Backer, K. and Yamano, N. (2007). The measurement of globalisation using international input-output tables. *OECD Science, Technology and Industry Working Papers*, 2007/08, OECD Publishing, Paris. http://dx.doi.org/10.1787/242020221356.

Horvát, P. and Yamano, N. (2019). Measuring industry employment by the gender, age and skills dimensions, OECD DSTI/CIIE/WPIA(2019)4.

Horvát, P., Webb, C., and Yamano, N. (2020). Measuring employment in global value chains. *OECD Science, Technology and Industry Working Papers*, (2020/01), OECD Publishing, Paris. https://doi.org/10.1787/00f7d7db-en.

Institute of Developing Economies (IDE-JETRO) (2006). Asian International Input-Output table 2000: Volume 1 Explanatory Notes, *Statistical Data Series*, 89.

ILO. (2012). International Standard Classification of Occupations (ISCO 08), Geneva, Switzerland, www.ilo.org/public/english/bureau/stat/isco/isco08/index.htm

Korinek, J., Moïsé, E., and Tange, J. (2021). Trade and gender: A Framework of analysis, OECD Trade Policy Papers, No. 246, OECD Publishing, Paris

Los, B., Timmer, M., and de Vries, G. (2015). How important are exports for job growth in China? A demand side analysis. Journal of Comparative Economics, 43(1), 19–32. https://doi.org/10.1016/j.jce.2014.11.007

Marcolin, L., Miroudot, S., and Squicciarini, M. (2016). GVCs, Jobs And Routine Content Of Occupations, *OECD Trade Policy Papers*, No. 187, OECD Publishing, Paris, http://dx.doi.org/10.1787/5jm0mq7kr6s8-en.

Michel, B. and Hambÿe, C. (2021). Export-sustained employment: accounting for exporter-heterogeneity in input–output tables, Economic Systems Research, DOI: 10.1080/09535314.2020.1869701

Miller, R. and Blair, P. (2009). Input-Output Analysis: Foundations and Extensions, Cambridge: Cambridge University Press.

OECD. (2016). Global Value Chains and Trade in Value-Added: An Initial Assessment of the Impact on Jobs and Productivity, *OECD Trade Policy Papers*, No. 190, OECD Publishing, Paris, https://doi.org/10.1787/5jlvc7sb5s8w-en.

OECD. (2017). OECD Science, Technology and Industry Scoreboard 2017, OECD Publishing, Paris, https://doi.org/10.1787/9789264268821-en.

OECD. (2021a). Trade in Value Added (TiVA), Paris: OECD, http://oe.cd/tiva.

OECD. (2021b). Inter-Country Input-Output Database, Paris: OECD, http://oe.cd/icio.

OECD. (2021c). Input-Output Database, Paris: OECD, http://oe.cd/i-o.

Olivetti, C. and Petrongolo, B. (2016). The Evolution of Gender Gaps in Industrialized Countries, *The Annual Review of Economics*, no 8, pp.405-34, https://doi.org/10.1146/annurev-economics-080614-115329

Portella-Carbó, F. (2018). Effects of International Trade on Domestic Employment: an Application of a Global Multiregional Input-Output Supermultiplier model (1995-2011), *Economic Systems Research*, 28(1), 95–117, http://dx.doi.org/10.1080/09535314.2016.1142429.

Rueda-Cantuche, J.M., Kutlina-Dimitrova, Z. and Sousa, N. (2019). Female Participation in EU exporting activities: Jobs and wages, Chief Economist Note, issue 3, September 2019

Schaffer, A. (2007). Women's and Men's Contributions to Satisfying Consumers' Needs: A Combined Time Use and Input–Output Analysis, *Economic Systems Research*, 19(1), 23-36, DOI: 10.1080/09535310601164732

Timmer, M.P., Los, B. Stehrer, R. and de Vries, G.J. (2013). Fragmentation, Incomes and Jobs: an Analysis of European Competitiveness. *Economic Policy*, 28, 613–661

UNESCO. (2012). International Standard Classification of Education (ISCED 2011), Montreal, Canada, http://uis.unesco.org/en/topic/international-standard-classification-education-isced

Valadkhani, A. (2005). Cross-country analysis of high employment-generating industries, Applied Economics Letters, 12:14, 865-869, DOI: 10.1080/13504850500358942.

World Bank. (2012). Chapter 5 Gender Differences in Employment and Why They Matter. World Development Report

Annex A. Industry list, Trade in Employment by workforce characteristics database

Macro sectors		TiM by workforce characteristics industries	ISIC Rev.4 Divisions
Agriculture	1	Agriculture, hunting, forestry and fishing	01 to 03
Mining and utilities	2	Mining and utilities	05 to 09, 35 to 39
Manufacturing	3	Food, textiles, wood & printing, and other manufacturing	10 to 18, 31 to 33
	4	Petroleoum & chemicals, rubber & plastics, and minerals & metals	19 to 25
	5	ICT & electronics, electrical equipment, transport manufacturing	26 to 30
Construction	6	Construction	41, 42, 43
Services	7	Wholesale & retail, transport & storage, accomodation & food	45 to 56
	8	Information and communication	58 to 63
	9	Finance and insurance	64 to 66
	10	Real estate, other business services	68 to 82
	11	Public administration & social work, education & health	84 to 88
	12	Other services	90 to 98
Total			01 to 98
Total Manufactures			10 to 33
Total Services			45 to 98

Annex B. Industry hierarchy, Trade in Employment database

Level 1	Level 2	Level 3	Level 4
DTOTAL			
D01T03			
D05T39	D05T09	D05T06	
		D07T08	
		D09	
	D10T33	D10T12	
		D13T15	
		D16T18	D16
			D17T18
		D19T23	D19
			D20T21
			D22
			D23
		D24T25	D24
			D25
		D26T27	D26
			D27
		D28	
		D29T30	D29
			D30
		D31T33	
	D35T39		
D41T43			
D45T82	D45T56	D45T47	
		D49T53	
		D55T56	
	D58T63	D58T60	
		D61	
		D62T63	
	D64T66		
	D68		
	D69T82		
D84T98	D84T88	D84	
		D85	
		D86T88	
	D90T98	D90T96	
		D97T98	

Annex C. Country data availability

		Persons	Gender	Age	Education	Occupation
1	AUS	x	x	x	-	x
2	AUT	x	x	x	x	x
3	BEL	x	x	x	x	x
4	CAN	x	x	x	x	x
5	CHL	x	y	y	y	-
6	COL	x	y	y	y	y
7	CRI	x	y	y	y	y
8	CZE	x	x	x	x	x
9	DNK	x	x	x	x	x
10	EST	x	x	x	x	x
11	FIN	x	x	x	x	x
12	FRA	x	x	x	x	x
13	DEU	x	x	x	x	x
14	GRC	x	x	x	x	x
15	HUN	x	x	x	x	x
16	ISL	x	x	x	x	x
17	IRL	x	x	x	x	x
18	ISR	x	y	y	y	y
19	ITA	x	x	x	x	x
20	JPN	x	x	x	-	y
21	KOR	x	y	y	y	-
22	LVA	x	x	x	x	x
23	LTU	x	x	x	x	x
24	LUX	x	x	x	x	x
25	MEX	x	x	x	x	-
26	NLD	x	x	x	x	x
27	NZL	x	x	-	x	x
28	NOR	x	x	x	x	x
29	POL	x	x	x	x	x
30	PRT	x	x	x	x	x
31	SVK	x	x	x	x	x
32	SVN	x	x	x	x	x
33	ESP	x	x	x	x	x
34	SWE	x	x	x	x	x
35	CHE	x	x	x	x	x
36	TUR	x	x	x	x	x
37	GBR	x	x	x	x	x
38	USA	x	x	x	x	x
39	BGR	x	x	x	x	x
40	CYP	x	x	x	x	x
41	HRV	x	x	x	x	x
42	MLT	x	x	x	x	x
43	ROU	x	x	x	x	x

x	Sufficient industry detail available
y	Limited years
-	Data not available / with insufficient industry detail