International Transport Forum

The Gender Dimension of the Transport Workforce

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Discussion Paper

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Introduction

Transport is a male-dominated sector that contains gender gaps throughout all levels of the workforce. Gender gap can be defined as the unequal outcomes experienced between women and men in the workforce, and women's restricted access to rights and assets (EIGE, 2020). More broadly, male-dominated sectors consist of industries and occupations where women comprise less than 25% of job incumbents (U.S. Department of Labor, 2017). They reflect a more traditional workplace, one created, maintained and controlled by males since inception (Jandeska and Kraimer, 2005). Progress in closing most gender gaps is slow. The gender gaps with respect to key labour market indicators have not narrowed substantially for the past 20 years (ILO, 2019a). Differences remain in employment rate, part-time work, unpaid care and family responsibilities, professions and decision-making positions, working conditions, wages, and the possibilities for economic independence between women and men (EIGE, 2020).

In 2018, females represented less than 20% of the global transport workforce (ILO, 2019b). Within the European Union (EU), in the same year, the average female participation rate in the transport-related workforce was 22%, while the EU average female participation rate for the total workforce was 46% (EC 2018). Despite this gap, the EU has one of the highest rates of female employees in the transport workforce compared to other parts of the world. While women do participate in the transport workforce, relatively few women rise to managerial positions. In global supply chains and logistics, women occupy less than 20% of top executive positions across all sectors (Vaughan-Whitehead and Caro, 2017). It is also more common for women to have less job security and lower paid jobs than men (Barrientos ,2019; Turnbull, 2013) across the transport sector. Women may be subject to vertical occupational segregation, where the highest status jobs are dominated by men, and thus women have less job security and find themselves in lower paid jobs (Wright 2016). The historically low representation of women in the transport sector creates gender-biased attitudes and barriers, as well as discriminating work environments and conditions (Fraszczyk and Piip, 2019; Turnbull, 2013).

The share of women's participation in the transport sector also differs by mode. For example, the employment rates in the railway industry in the United Kingdom are 16% female and 84% male, even though 47% of its national workforce is female (Women in Rail, 2015). In the European Union's urban public transport sector, women account for approximately 18% of total employees on average, ranging between 5% to 31%, but represent less than 10% of drivers (WISE, 2012). While 40% of the employees in the aviation sector are women, most of them work as flight attendants or in customer service-related roles (Turnbull, 2013) and only 2% of all pilots seeking employment are female (Turnbull, 2013). The International Air Transport Association (IATA) also estimated that only 5% of the global pilot population is currently female and only 3% of airline CEOs are female (IATA, 2019). The fact that women are under-represented as pilots, as well as in maintenance, repair and overhaul roles, is largely a result of stereotyped views that women do not have the abilities required to fly or repair an aircraft, and a lack of encouragement for women to choose careers in aviation (Seligson, 2019). Similarly, in maritime areas, women represent only 2% of the world's 1.2 million seafarers (IMO, 2020), while some estimates suggest that 28% to 30% of cruise ships workers are women seafarers (ILO, 2019c).

Gender diversity in the workplace does not only benefit women. Mounting evidence shows that it is a benefit to societies, economies, the environment and enterprises themselves (ILO, 2019d). Greater gender equality or diversity in the transport workforce will not only address the discrimination women face in the workforce as a matter of human rights and fundamental principles and rights at work, it will also create more economic efficiency leading to poverty reduction (UN Women, 2016). Poverty rates are higher for

women than for men on a global level, in both urban and rural areas (World Bank, 2018). Existing gender inequalities also make women and girls more vulnerable than men and boys to poverty (World Bank, 2011). Increasing women's participation in the workforce could thus play an important role in poverty reduction.

Women play a critical role as economic agents capable of transforming societies and economies. Making the transport sector more attractive to women is critical for welfare gains, productivity, business and economic growth for all. Increasing female employment will yield economic gains greater than an equivalent increase in male employment, as gender diversity creates benefits on its own through the inclusion of new skills, differences in risk preference and response to incentives (Ostry et al., 2018). Therefore, gender equality is not just an intrinsic value and a right in itself, but it is also instrumental in achieving economic growth and poverty reduction. The private sector should see gender diversity as part of a larger dynamic of innovative and sustainable business practices, which also contribute to improved outcomes. Diversity helps companies to focus on their future sustainability and how best to thrive in a changing global business environment (ILO, 2019d; Kau and Kleiner, 2001).

Attracting and retaining more women in the transport workforce will allow for better planning and designing of transport systems and services that cater to the needs of women users. A multitude of perspectives is required to ensure inclusive transport and mobility systems and services. Increasing the representation and visibility of women at all stages of transport policy, planning, implementation, and usage of transport projects will make transport more responsive to the needs of all users and even increase the sustainability of transport development (Fraszczyk and Piip, 2019; Kronsell, Rosqvist and Hiselius, 2016). Women tend to have stronger preferences for improving sustainability in the sector and are change agents who could challenge the dominant male norms and trigger changes in transport policies for greater levels of sustainability (Kronsell, Rosqvist and Hiselius, 2016).

The traditional perception that transport-related jobs require physical strength is increasingly less relevant as technology advances and digital innovations are applied throughout the sector (Barrientos, 2019). This also emphasises a need for more men and women to specialise in Science, Technology, Engineering and Mathematics (STEM) academic disciplines in order to meet the future workforce needs of the transport sector. However, there are still challenges and barriers limiting women's participation in the transport workforce, which mostly fall under the categories of working conditions (e.g. total working hours, time of work and place of work) and gender stereotyping (Turnbull, 2013). Employment in the road transport sector for example, is especially unattractive to women in terms of working hours, working away from home, lack of family-oriented practices and measures, and barriers to positions and career progression (Turnbull, 2013).

The public transport sector does not currently provide women with adequate training opportunities and representation in unions. They are subject to poor working environments, safety and health concerns, lack of facilities, including decent sanitation facilities, as well as violence and harassment from colleagues and passengers (Wright, 2018). These are also some common challenges in maritime, rail and logistics transport (Women in Rail, 2015; Turnbull, 2013; Barrientos, 2019). Equal access and career development opportunities are also lacking in aviation transport (Ferla and Graham, 2019) and in the sector as a whole.

Gender stereotyping is another core factor leading to the high levels of gender inequality in the transport sector. It creates negative consequences for women in the workplace by compromising women's ability to gain acceptance and obtain high-level positions (Heilman and Parks-Stamm, 2007). Gender stereotypes can create biased perceptions that can affect the evaluation of women in the workforce, as well as career-related decisions pertaining to women. Such prejudices are deeply embedded in some cultures or in male-dominated sectors. This also reflects the intersection between work and the society, where gender

stereotypes also exist in culture, family structures, institutions, access to education opportunities, or the lack of encouragement to study and subsequently pursue a career in transport (Turnbull, 2013).

Despite the low levels of ascension of women into top leadership roles in male-dominated industries and organisations (Campuzano, 2019; Seo, Huang and Han, 2017; Bierema, 2016), firms have started to adjust their companies to attract and retain women in the workforce in transport and taking proactive actions in recruiting, developing and advancing qualified female employees (Kau and Kleiner, 2001).

The participation in unpaid care work is the main reason why not enough women are in the labour force (ILO, 2019a). The high concentration of women in lower categories of work reflects deeply-embedded gender norms that undervalue their contribution and position in both paid and unpaid work (Barrientos, 2019). Women perform 76% of the world's total unpaid work, which is valued at 9% of global Gross Domestic Product (GDP) (ILO, 2018). Women also spend two to ten times more time on unpaid work than men around the world (Ferrant, Pesando and Nowacka, 2014). Hence, in order to increase women's participation in the workforce, gender equality in unpaid work will also need to be addressed, together with improvements and investments in infrastructure and public services, as well as the conversion of unpaid work into market-oriented jobs (Ferrant, Pesando and Nowacka, 2014; Woodroffe and Donald, 2014; Madgavkar, Ellingrud and Krishnan, 2016). The International Labour Organization also suggests the existence of a "motherhood employment penalty", which implies that women with young children tend have lower levels of employment compared to women without children of that age and experience a "motherhood leadership penalty", translating into lower participation rates in managerial and leadership positions (ILO, 2019a). Although the topic of unpaid care work, defined as household work and caregiving either in the household or in the community (Woodroffe and Donald, 2014), is beyond the scope of this study, it is important to recognise that the lower female representation in the paid workforce is mirrored by their higher representation in unpaid work.

It is imperative to close the gender gap in the transport sector and to better design and implement policies that will do so. This study is an in-depth quantitative analysis on the correlations between women's participation in the transport labour force and variables related to socio-economic factors, education and labour laws in 46 countries, and provides subsequent policy insights. The transport workforce in this study is defined by six transport-related categories, following the ILO's job divisions: 1) civil engineering, 2) land transport and transport via pipelines, 3) water transport, 4) air transport, 5) warehousing and support activities for transport, 6) postal and courier activities. Although civil engineering covers a wide scope of jobs and not all of them are transport related, it is considered in this study because all transport infrastructure jobs, such as the design, build and maintenance of roads, airports, bridges, ports, highways, rail systems, and tunnels are included in this category.

Background

Despite the benefits of gender equality in the transport workforce, women who decide to pursue a career in the transport sector encounter severe challenges. Studies have shown that such challenges can be broadly categorised into seven groups, 1) work organisation (e.g. opportunity to do part-time work, or teleworking); 2) work-life balance (e.g. parental leave, childcare); 3) health and safety at the workplace; 4)

working culture; 5) wages; 6) career, qualification and training and 7) recruitment (WISE, 2012). This section presents policies that can influence some of these challenges and barriers to women in the transport workforce, and ultimately improve the level of gender equality in the sector. These policies are relevant to the education and training, hiring and retaining of women, as well as labour laws that can set a legal framework for gender equality. Specific examples, such as the female labour force participation rate, gender parity index for tertiary education enrolment, STEM academic disciplines' female tertiary attainment rate, maternity leave and equal pay law, are included in this study's analysis and are further described in the Methodology section.

Transport-related education and training

Education and training in the skill sets essential to the success of a career in the transport sector will help prepare the best qualified women and men to enter the sector. This study focuses on two different aspects of education and training: the advancement of tertiary education and the choice of STEM academic disciplines for women. Training and education initiatives need to be coupled with societal interventions to address social and cultural norms related to gender equality, the promotion of positive images of women in STEM in the media, and policies and legislation that could include quotas, wage transparency and financial incentives (UNESCO, 2017).

Although the transport sector offers numerous types of career options, many fundamental transport jobs are STEM related. Common examples include transport engineers, distribution and logistics management, transport or traffic planners. Jobs that traditionally require the application of STEM skill sets are increasing due to the evolving need to accommodate the merge of transport and technology, and the shift to autonomous and connected vehicles, smart infrastructure and transport systems, big data, artificial intelligence, Internet of Things (IoT), emerging new mobility services, as well as the changing technologies that will affect the way work is being carried out (Ivey 2019). STEM competencies will be required in the future workforce even in non-STEM fields. This will then increase the need for strong industry and academic partnerships necessary to create impactful and transformative initiatives that will educate and train more women in STEM (Ivey, 2019).

It has been proven since the 1990s that female students have demonstrated interest and aptitude in STEM, yet they were under represented in STEM subjects at tertiary level of education (Hanson 1996) and this trend still remains today (Christie et al., 2017). Female students who graduate in these disciplines were also found to be paid less than their male counterparts and have less career advancement opportunities (Christie et al., 2017). Approximately 30% of female tertiary students choose STEM academic disciplines worldwide. Specifically, 3% of students joining information and communication technology (ICT) courses are women, 5% for mathematics and statistics courses, and 8% for engineering, manufacturing and construction courses (UNESCO, 2017). The low participation of women in STEM education and careers affects more than women. It is in fact a missed opportunity for related sectors as women bring different perspectives that shape and influence STEM disciplines and can increase social benefits from STEM (Milgram, 2011).

The reasons for the under representation of female students in STEM are largely based on:

- individual level (e.g. biological, psychological, self-efficacy, and interest factors)
- family and peer level (e.g. parental beliefs and expectations, parents' education and profession, household assets and support, and peer influence)

- school level (e.g. quality of teachers and their attitudes, beliefs and behaviours, teaching curricula and learning materials, apprenticeship programmes, and assessments)

- societal level (e.g. societal and cultural norms, policies and legislation, gender stereotypes in mass and on social media factors (UNESCO, 2017).

Positive outcomes often reflect the interaction of factors in all four levels. Similarly, interventions to improve gender equality in STEM need to come from the same four levels. For example, on an individual level, interventions are necessary to build self-efficacy, interest and motivation among girls to pursue STEM studies and careers, while on a family and peer level, interventions to engage parents and families to address misperceptions about careers in STEM, to expand the understanding of STEM educational opportunities and careers and to connect families to educational advisers to develop STEM career pathways are critical (UNESCO, 2017). In addition, school level interventions must address teachers' perceptions and capacity, to develop and deliver gender responsive curricula, implement gender-neutral assessments and expand access to scholarships (UNESCO, 2017).

Hiring and retaining of female employees

The underrepresentation of women in the transport sector is partly because of their underrepresentation in the education and training stage, and also because of the low retention in the workforce. In cases where women are entering a male-dominated field, they tend to switch jobs when there are no opportunities to advance in their career (Fraszczyk and Piip, 2019). Hence, in order to close the gender gap in the transport workforce, barriers restricting the promotion and retainment of women once they are in the field would need to be addressed. The retainment of talent, regardless of gender, requires clear paths to promotion, the implementation of goals within the organisation to both attract and retain female employees and the access to role models and mentors (Godfrey and Bertini, 2019).

Mentors can attract women to the engineering field and the presence of female role models has effectively retained women in the field throughout their careers by demonstrating possible success in a male-dominated sector (Drury, Sly and Cheryan, 2011). Better visibility of successful career projections of women in the sector will thus encourage more women to stay in the sector, despite of negative gender stereotypes (Stout et al., 2011).

Parenthood also leads to the loss of women in the transport workforce. In the United States, approximately 24% of mothers of pre-schoolers opted out of the labour force, including from transport in 2009 (U.S. Census Bureau, 2009). Flexible work schedules, generous maternity leave policies, opportunities for advancement, and support for childcare are practices that will help retain women in the workforce after childbirth and in fact, are also the same set of measures that can help attract women into the sector in the first place (Turnbull, 2013; Baruah, 2019). These measures are especially crucial as women tend to leave their work more frequently after a maternity leave than at any other point in their careers due to the double standards they face when returning to work (Baruah, 2018). The concept of performance over the number of hours spent at work should also be reassessed as a criterion for promotion, which could be supported by teleworking and flexible work schedules (Baruah, 2019).

Achieving a more diverse and inclusive transport-sector workforce requires actions from government, the private sector and unions. Women are under-represented in trade unions and employers' organisations (ILO, 2019d). Furthermore, the presence of women in the collective bargaining process is important to achieving outcomes that benefit women and can help in shaping hiring and retaining strategies. These existing conditions make it challenging to achieve better gender parity in the transport sector. From a

company's perspective, ways to attract and increase the hiring of women include flexible working arrangements, paid maternity leave, on-going training opportunities, equal pay polices, and codes of conduct in the workplace (Turnbull, 2013).

Some companies are now working together through various platforms to explore the challenges of achieving better gender parity in the transport sector. They aim to increase the sector's attractiveness to female employees, discuss gender inclusive recruitment methods and the retention of female talent (ITF, 2019). Specific measures undertaken by various companies (ITF, 2019) include the following.

- Minimising unconscious bias through training;

- Awareness building;

- Simulations and role play;

- Setting ambitions in the recruitment process;

- Implementing innovative work practices for employee retention, such as different options of progression paths across managerial, technical and non-technical roles, and job rotation;

- Encouraging cross-sectoral transition and acknowledging the transferability of skills;

- Collecting data to assess, benchmark and track progress;

- Providing role models and mentorship, and

- Practicing inclusive writing of job advertisements.

Labour laws for gender equality

The establishment of labour laws and rights will accelerate the improvement of gender equality in the transport workforce. Achieving gender equality goals requires simultaneous action that starts with different yet mutually reinforcing paths for women to acquire rights, such as equal pay, discrimination-, violence- and harassment-free work environment, and inclusive maternity, paternity and parental leave (ILO, 2019d).

Equal pay

The value of work performed by women relative to that performed by men is still not recognised or compensated for as being equal (ILO, 2019a). Globally, the gender pay gap stands at 23% (UN Women, 2018). The full application of the principle of equal remuneration for work of equal value (equal pay), set out almost 70 years ago in the ILO Equal Remuneration Convention, 1951 (No. 100) is essential to address the conscious and unconscious biases behind the inequality. Ensuring equal pay for equal work regardless of gender, as many countries have now done through legislation, such as Sweden, the United States, the United Kingdom, France, and Australia can give some support to gender equality (OECD, 2019; Polachek, 2019). In fact, 173 countries have ratified the Convention No. 100. However, gender pay gaps remain in most countries more than 50 years since the enactment of the equal pay law (Polachek, 2019). In the United States, women earn 18% less than men, while the gap is 17% in the United Kingdom, 10% in France and 14% in Australia. Each extra child a woman has will also increase the gap by between 2% and 10% (Polachek, 2019).

Work environments without discrimination, violence and harassment

There is a common misconception that transport and logistics jobs require measurable physical strength and have difficult or even dangerous working conditions. Gender stereotyping often dictates that such work is unsuitable for women, even resulting in regulations limiting women's participation for many countries (Fraszczyk and Piip, 2019; Kitada and Harada, 2019). The abolishment of laws, regulations, and cultural practices that restrict the types of transport jobs in which women can engage or that limit women's freedom of movement can be a first step. For example, 16 countries have laws in place that forbid women to perform certain tasks in the transport sector (World Bank, 2020a). In addition, out of the 92 countries with available 2018 data, 54 of them have laws restricting non-pregnant, non-nursing women from performing the same occupations as men, many of which concern jobs in the transport sector (Kitada and Harada, 2019). Relevant national labour laws drafted under the ILO's Discrimination (Employment and Occupation) Convention, 1958 (No. 111) will help to close these gaps.

In addition, it is necessary to break the silence over violence and harassment against women in the transport sector, which lowers the sector's chances to attract and retain women. Governments can take a proactive approach with respect to the elimination of violence and harassment, including bullying and sexual harassment. The recently adopted ILO Violence and Harassment Convention, 2019 (No. 190) will enter into force in 2021. It is the first international instrument providing guidance on these issues. For example, alarming evidence of high levels of violence against women at work are present in the transport sector across Europe, "where a culture of violence is regularly seen to be part of the job" (ETF, 2017).

Inclusive leave for maternity, paternity and parental needs

An unequal distribution of domestic tasks at home limits women's workforce participation. Among 28 OECD countries, women spend 4.5 hours more per day on average than men doing unpaid work, including childcare and housework (OECD, 2020a). Instruments such as the Workers with Family Responsibilities Convention, 1981 (No. 156) and Maternity Protection Convention, 2000 (No. 183) help to provide equal opportunities and special protection for pregnancy and against discrimination. In addition to maternity leave laws, initiatives for affordable childcare, workload adjustments and improved acceptance of paternity leave or increases in its length could help to redistribute these responsibilities (ILO, 2014).

Methodology

This section presents the methodology applied in this study. The core analysis was conducted using a panel regression to examine the correlation between seven selected variables in 46 countries over a period of ten years, from 2008 to 2018. As most existing studies on women's participation in the transport workforce are based on qualitative analysis, the quantitative approach applied in this study complements them by reinforcing the statistical correlation between variables. Unlike time-series or cross-sectional data, panel data controls for individual heterogeneity, which in this case allows it to measure the impact of the independent variables, while controlling for particular histories or political regimes of countries (Baltagi, 2005). Panel data are also particularly adept at revealing the impact of policy measures or societal shifts,

such as women entering the workforce, since the purpose of this study is to also capture the evolution of the same countries over time. Specifically, for this study, a panel regression analysis can measure how policy measures, such as labour laws and societal shifts, including more women choosing to study STEM disciplines, have impacted the level of female participation in transport-related professions during the decade studied. For similar reasons, panel data analysis has been used in existing studies that explain gender differences in the workforce across countries (Gunn et al., 2019; Olivetti, 2014; Charles, 2003). A random effects model was used in order to understand the differences between countries and within countries over time. The regression analysis was conducted using the PLM package in R, which follows the set of estimators and tests for panel data econometrics that are described in Baltagi (2013), Hsiao (2014) and Croissant and Millo (2018). Conducting a regression analysis on the participation of women in the transport workforce will indicate which variables are correlated, holding all of the other variables in the model constant.

Data

The dependent variable in the regression model is female participation in the transport workforce as a percentage. The source is the employment data by sector from the ILO, following the fourth revision of the International Standard Industrial Classification of All Economic Activities (ISIC). In this study, the transport workforce is defined to include divisions 49 to 53 from section H (Transportation and storage) and division 43 from section F (Construction). As Canada does not have employment data following ISIC, a mapping was made based on data in North American Industry Classification System (NAICS), which is presented in the table below.

Table 1. Mapping for Canada from North American Industry Classification System to International Standard Industrial Classification

North American Industry Classification System (NAICS)	International Standard Industrial Classification (ISIC) equivalent
Division 237	Division 42, Civil engineering
Divisions 482, 484, 485, 486, 487	Division 49, Land transport and transport via pipelines
Division 483	Division 50, Water transport
Division 481	Division 51, Air transport
Divisions 488, 493	Division 52, Warehousing and support activities for transport
Divisions 491, 492	Division 53, Postal and courier activities

The seven independent variables in the model are as follows.

- Real GDP per capita

- Female participation rate in the total workforce

- Gender parity index for tertiary enrolment

- Percentage of women with tertiary STEM degrees

- Fertility rates

- Existence of an equal pay law

- Law to ensure the right to maternity leave.

Additionally, labour laws mandating: non-discrimination based on gender, guaranteed equivalent position after maternity leave, father-specific paid leave and restrictions on job accessibility to pregnant or nursing women were also analysed.

Data for each of the seven variables were collected from different sources. The GDP divided by the mid-year population in constant 2010 USD came from the national accounts data of the World Bank (2020b) and the OECD. The labour force participation rate of women refers to the percentage of women older than 15 years-old who are economically active as defined by the ILO Department of Statistics (ILOSTAT) database of the ILO (retrieved September 2019). The gender parity index (GPI) for gross enrolment in tertiary education, which includes public and private schools, was collected from the UNESCO Institute for Statistics (UIS). The GPI for tertiary enrolment was chosen over the GPI for tertiary attainment because it had more extensive data coverage. The percentage of female graduates from STEM programmes in tertiary education was estimated by UIS. The STEM data were given a five-year time lag to better measure insertion and retention of graduates in the field.

The fertility rate represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with age-specific fertility rates of the specified year. Data for this variable is from the World Development Indicators database of the World Bank. The original sources include the 2019 Revision of the World Population Prospects from the United Nations Population Division, census reports and other statistical publications from national statistical offices, demographic statistics of Eurostat, the Population and Vital Statistics Report of the United Nations Statistical Division, the International Database of the U.S. Census Bureau and the Statistics and Demography Programme of the Secretariat of the Pacific Community.

The Women, Business and the Law (WBL) project of the World Bank Group was the source for data on laws mandating equal remuneration for men and women for work of equal value and laws mandating non-discrimination based on gender in hiring. Data on laws mandating paid or unpaid maternity leave and laws guaranteeing an equivalent position after maternity leave were taken from The World Development Indicators database of the World Bank. OECD data on the length of paid paternity leave were modified to be a dummy variable showing whether or not such leave exists. Data were only available for alternating years concerning the variables on existing labour laws. For the purposes of this study and in order to not have significant data gaps when running the model, it was assumed that if the law did/did not exist at time T then it also did/did not exist at time T+1.

ILO data on female share of employment in senior and middle management had insufficient coverage in terms of countries and years to be included in the panel regression analysis. However, the data were studied in relation to the dependent variables, which can be found in the descriptive statistics section (Table 5). The data coverage by country and year differs for each variable studied, including the different divisions of the transport sector. The number of countries is highlighted in most tables to improve the transparency of these differences and the exact countries included in the model are listed below.

For the descriptive statistics shown in the next section, countries are grouped into the following regions: Africa, Asia, the European Economic Area (EEA) and Turkey, Latin America, North America, and transition economies. The data included in the panel regression model are missing countries in the Middle East and

most of Africa, Asia and countries with transition economies (Table 2). The model on female participation in the total transport workforce includes the following countries by region. From the EEA: Belgium, Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland and the United Kingdom. Africa includes Uganda, Asia includes Brunei Darussalam, Cambodia, and Mongolia, and Latin America includes Brazil, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico and Panama. North America includes the United States and transition countries include North Macedonia and Serbia.

Table 2. Number of countries in panel regression models by region

	Civil engineering	Land transport and transport via pipelines	Water transport	Air transport	Warehousing and support activities for transport	Postal and courier activities	Total transport workforce
EEA and Turkey	25	26	23	26	27	25	26
Africa	1	0	0	0	1	0	1
Asia	1	3	0	2	3	2	3
Latin America	6	7	5	5	7	6	7
North America	1	1	1	1	1	1	1
Transition	2	2	1	1	2	2	2
TOTAL	36	39	30	35	41	36	40

Descriptive statistics

Data from 46 countries showed that in 2018, the average female participation rate in the transport sector was 17% (Table 3). The lowest proportions of women in the workforce at the divisional level are civil engineering and land transport and transport via pipelines, both at 12% percent. These were surpassed by water transport at 23%, warehousing and support activities for transport at 26%, postal and courier activities at 36% and air transport at 43%. Postal and courier activities has the most variability between countries, with a standard deviation of 15 percentage points, while civil engineering shows the least variance with a standard deviation of 4 percentage points.

Table 3. Female participation by workforce division in 2018

	Civil engineering	Land transport and transport via pipelines	Water transport	Air transport	Warehousing and support activities for transport	Postal and courier activities	Total transport workforce
Median (%)	10.6	12.1	23.5	43.2	26.4	35.1	19.0
Average (%)	11.8	11.8	22.6	42.9	26.4	36.1	17.3
Standard Deviation	4.3	5.0	9.7	10.8	5.9	15.1	6.0
Number of Countries	36	46	26	31	42	42	46

Data Source: International Labour Organisation (2019).

In 2018, North America had 23% female participation rate in the transport workforce. This is the highest average among all regions with available data (Table 4). Transition countries had 16%, an average slightly below the global level and the EEA and Turkey were just above with 19%. There are important limits to these findings since the data coverage varies greatly by region.

Table 4. Female participation in the transport workforce by region in 2018

	Number of countries	Average female participation in the transport workforce (per cent)
EEA and Turkey	33	18.9
Africa	1	8.1
Asia	2	8.4
Latin America	6	10.8
North America	2	23.2
Transition	2	16.3
Total	46	17.3

Data Source: International Labour Organisation (2019)

While female participation in the transport workforce is progressing in some countries, the global averages have remained quite stable. This is due to decreases in female participation in the sector among several of the countries with some of the smallest gender gaps (Figure 1).

Figure 1. Evolution in rates of female participants in the transport workforce 2008-18
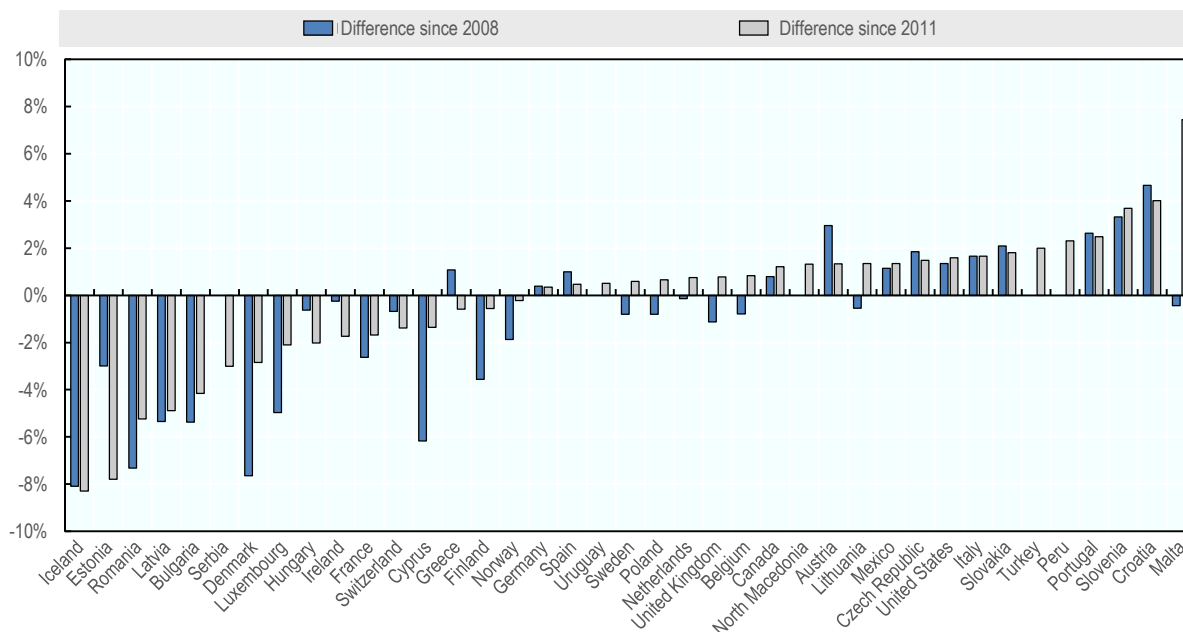
Note (by Turkey): The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note (by all the European Union Member States of the OECD and the European Union): The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

There were minimal changes in female participation in all divisions of the transport sector between 2011 and 2018 (Figure 2). The largest country-level declines were within the postal and courier activities division, more specifically in a subset of European countries. These had decreases in labour participation of up to 35 percentage points for women in the workforce, from 2008 to 2018. The air transport division shows the most notable growth in female labour participation, particularly in Europe, with country-level increases of up to 19 percentage points since 2008. However, the average female participation in the air transport sector for 43 countries across the world has only increased by 5 percentage points since 2011 (Figure 2).

Figure 2. Percentage of global average female participation rates by sector
2011-18
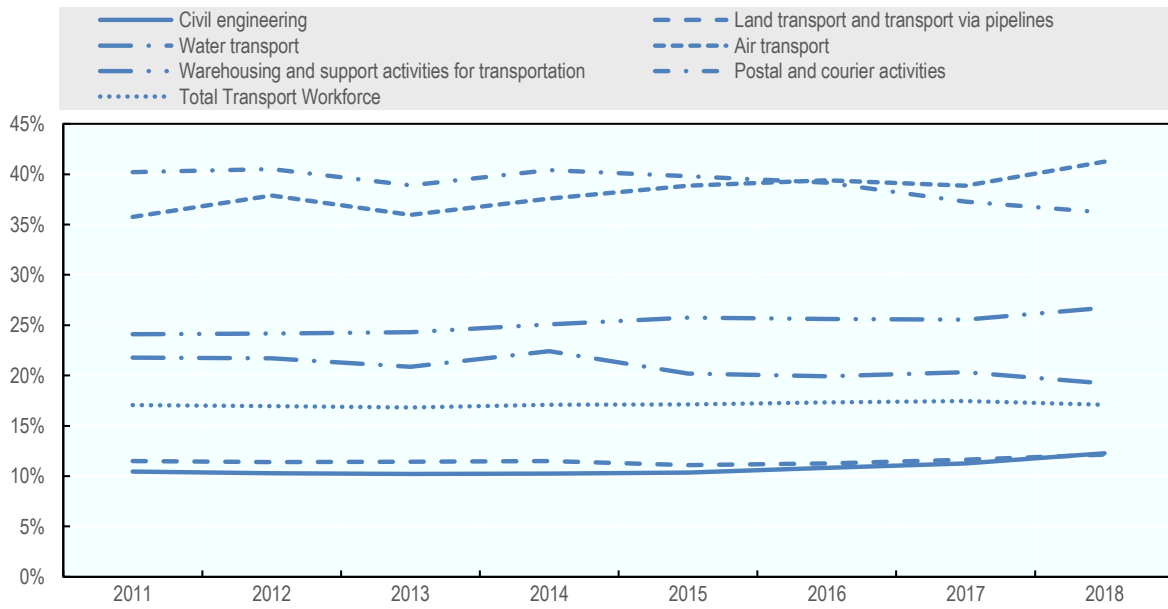
Note: The number of countries included in each division of the transport sector are as follows: Civil engineering (44), land transport and transport via pipelines (50), water transport (35), air transport (43), warehousing and support activities for transportation (50), postal and courier activities (47), total transport workforce (50). Estimations were made based on existing data trends to fill data gaps for varying years and divisions for Armenia, Belgium, Brazil, Bulgaria, Cambodia, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, El Salvador, Hungary, Iceland, Latvia, Lithuania, Luxembourg, Malta, Mauritius, Mongolia, Montenegro, Namibia, Philippines, Poland, Portugal, Romania, Serbia, Slovenia, Thailand, Uruguay, and Viet Nam.

Table 5 shows a significant positive correlation between the proportion of female managers in the transport sector and the total female participation in the transport workforce. This finding supports the importance of female role models in attracting and retaining a more diverse workforce. Equality in education is also important to improve female representation in the workforce, with tertiary enrolment GPI having a significant positive correlation with female participation in the transport sector. However, the gender gaps in the transport sector cannot be closed only by focusing on STEM equality. There are many jobs within the field for which different educational backgrounds are needed. STEM female attainment rate is even negatively correlated with female participation in the transport sector.

Table 5. Correlations with female participation in the transport sector

Variable	Female managers in transport sector	Total workforce female participation	Tertiary enrolment GPI	STEM tertiary attainment rate (female)
Correlation	0.380	0.192	0.469	-0.124
p-value	***	***	***	**
Confidence Interval (CI)	(0.233, 0.511)	(0.110, 0.271)	(0.389, 0.543)	(-0.227, -0.018)
Sample Size	147	554	400	340

Note: $**p<0.05$; $***p<0.01$

Source: International Labour Organisation for female managers in transport sector (ILO, 2020b), gender wage gap (ILO, 2019e), and total workforce female participation (ILO, 2019f). UNESCO Institute for Statistics for tertiary enrolment GPI (UIS, 2020a) and STEM tertiary attainment rate (UIS, 2020b).

Countries with legislation regulating equal pay, non-discrimination based on gender in hiring and access to the same position after maternity leave all have higher representations of women in the transport sector on average than those without such laws. Maternity leave and paternity leave are two cases where the legislative support of gender equality is associated with a lower average female participation rate in the transport sector. One reason for this trend is the small number of countries with available data are included in the "law missing" category (three and five countries respectively). Additionally, the United States is an outlier in this study with a high female participation rate in the transport sector (23% in 2018) and an absence of legislation on parental leave, which impacts the results in Table 6.

Table 6. Female participation in the transport workforce by labour law in 2018

	Average female participation in transport sector for those with law (%)	Number of countries with labour law	Average female participation in transport sector for those without law (%)	Number of countries without labour law	Total number of countries
Equal pay	18.4	33[a]	14.8	11	44
Non-discrimination	18.4	36[b]	13.6	8	44
Maternity leave	17.3	41[c]	20.1	3	44
Guaranteed position	18.2	32	15.7	12	44
Paternity leave	19.0	24	22.6	5	29

Note: a. All 33 countries had also ratified the ILO Equal Remuneration Convention, 1951 (No. 100).

b. All 36 countries but one had ratified the ILO Discrimination (Employment and Occupation) Convention, 1958 (No. 111).

c. Out of the 41 countries with maternity leave laws, 25 countries have not ratified the ILO Maternity Protection Convention, 2000 (No. 183).

Source: Equal pay (World Bank, 2020c), Non-discrimination (World Bank, 2020d), Maternity leave (World Bank, 2020e), Guaranteed position (World Bank, 2020f), and Paternity leave (OECD, 2020b).

Results

The linear panel regression model on the total transport sector shows that countries where more women are achieving equity in higher education enrolment, attaining STEM degrees and entering the larger workforce also tend to have higher female participation in transport related professions. The regression results for seven transport related job division presented in Table 7 give varying levels of relationship between GDP per capita, fertility rates, gender parity in higher education, female representation in the total workforce, legislative support of equity, and women's participation in the transport workforce. As shown in Table 7, there are statistically significant relationships between women's participation in the transport workforce and GDP per capita, female labour force participation rates, gender parity indices for tertiary education enrolment, and female STEM tertiary attainment rates, holding all other variables constant. The variables listed have positive coefficients, implying that countries with a comparatively higher level of GDP per capita, female participation in the work force, gender parity in tertiary education or STEM tertiary attainment rates for women also tend to have greater proportions of women participating in their transport workforce.

Table 7. Results of linear panel regressions

	Coefficient						
Variable	Total Transport Sector Participation (female) (Model 1)	Civil Engineering Participation (female) (Model 2)	Land Transport and Pipelines Participation (female) (Model 3)	Water Transport Participation (female) (Model 4)	Air Transport Participation (female) (Model 5)	Warehousing and Support Activities for Transport Participation (female) (Model 6)	Postal and Courier Activities Participation (female) (Model 7)
GDP per capita	0.000**	0.000	0.000	0.000	0.000	0.000	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Labour force participation rate (female)	0.002**	0.002	-0.0002	0.002	0.006***	0.001	0.005*
	(-0.001)	(-0.001)	(-0.001)	(-0.003)	(-0.002)	(-0.001)	(-0.003)
Fertility rate	-0.007	0.038***	-0.004	-0.001	-0.017	-0.000	0.061***
	(-0.005)	(-0.008)	(-0.007)	(-0.028)	(-0.023)	(-0.010)	(-0.023)
Gender parity index for tertiary education enrolment	0.050***	0.018	0.027*	0.048	-0.031	0.037	0.145***
	(-0.014)	(-0.023)	(-0.015)	(-0.068)	(-0.054)	(-0.028)	(-0.053)

Variable	Coefficient						
	Total Transport Sector Participation (female) (Model 1)	Civil Engineering Participation (female) (Model 2)	Land Transport and Pipelines Participation (female) (Model 3)	Water Transport Participation (female) (Model 4)	Air Transport Participation (female) (Model 5)	Warehousing and Support Activities for Transport Participation (female) (Model 6)	Postal and Courier Activities Participation (female) (Model 7)
STEM tertiary attainment rate (female)	0.001*	0.004***	0.001	-0.0004	0.005*	-0.001	-0.003
	(-0.001)	(-0.001)	(-0.001)	(-0.003)	(-0.002)	(-0.001)	(-0.002)
Maternity leave law (1=yes)	0.003	0.004	-0.0004	0.043	-0.043	-0.007	0.042
	-0.027	-0.022	-0.023	-0.065	-0.042	-0.028	-0.105
Equal pay law (1=yes)	0.009	0.011	0.031***	-0.022	0.024	0.026	0.046
	(-0.010)	(-0.013)	(-0.010)	(-0.039)	(-0.031)	(-0.017)	(-0.037)
Constant	-0.001	-0.111*	0.065	0.017	0.131	0.147**	-0.14
	(-0.051)	(-0.062)	(-0.051)	(-0.185)	(-0.122)	(-0.075)	(-0.207)
Number of Observations	237	218	235	176	199	237	230
R2	0.136	0.248	0.080	0.111	0.235	0.129	0.128
Adjusted R2	0.109	0.223	0.051	0.074	0.207	0.103	0.100
F Statistic	24.607***	68.881***	15.321**	18.025**	57.594***	26.177***	32.338***

Note: Standard errors are in parenthesis. *p<0.1; **p<0.05; ***p<0.01

With the exception of female STEM tertiary attainment rates, the same variables are statistically significant for the total transport workforce as for postal and courier activities. However, the GDP per capita coefficient is negative and fertility rate is significant and positively correlated to female employment in the postal and courier activities division. The opposite signs on these independent variables reflect the tendency for higher income countries to have lower fertility rates. Indeed, the country level trends show that many of the comparatively lower income countries included in the study have higher levels of female participation in postal and courier activities. The civil engineering division also shows a statistically significant positive coefficient for fertility rate, as well as a national level trend of lower income countries tending to rank higher in terms of female participation in the division.

The statistically significant positive coefficient for fertility rate in the postal and courier activities division could also be linked to the comparatively high level (36%) of female participation in this division compared

to the others (Table 3). As it is one of the few divisions that is not considered a male-dominated sector, the results could reflect working conditions that are able to attract and retain female employees, including those with children. However, since data on the type of work, i.e. part-time, full-time, flexible-time, or temporary, are unavailable and job levels are also unknown, it is unclear if female employees are staying by choice as they often hold clerical and low-level supervisory jobs in postal and courier activities (Jenkins, Lucio and Noon, 2002; Benbow, 2011).

The female labour force participation rate is statistically significant and positive for air transport and postal and courier activities, the two job divisions with the highest levels of female participation out of the six divisions included in this study. These results show that the greater the participation of women in the labour force in general, the higher the level of female participation in these two job divisions. This could imply the establishment of a more gender balanced trend in both divisions.

The coefficient for the gender parity index for tertiary education enrolment is positive and statistically significant for female participation in the transport sector as a whole. This is also true for land transport and pipelines, as well as for postal and courier activities. As for specific academic disciplines, a greater level of female participation in civil engineering and air transport might depend on an increase in STEM tertiary attainment rate, whose coefficient is significant and positive for these two job divisions. STEM tertiary attainment rate is not shown to be significant for the other four job divisions.

The existence of laws mandating paid or unpaid maternity leave are insignificant in increasing female participation in the transport workforce as a whole and in all the six job divisions. The maternity leave variable may be insignificant because a national law could be interpreted in various ways at a company's level, and the length, scope of benefits, flexibility of eligibility criteria, opportunities available post-maternity leave, and the social acceptance or bias could all vary across companies, sectors and countries. The value of a national maternity leave law will be greater when regional governments complement the benefits and eligibility criteria (Espinola-Arredondo and Mondal, 2008) and when companies create complementary incentives and programmes (Hideg et al., 2018). Additionally, there are outliers in the data and a few countries with missing legislation, which further limits the insights of the coefficient for this variable. Laws mandating equal remuneration for men and women for work of equal value are insignificant in all but one job division, as even though they have been enacted, they are not equally enforced across the different countries. The only division that shows a statistically significant coefficient for the equal pay law is land transport and pipelines.

Despite the significance of the regression analysis, the regression model presented could only explain a limited amount of the variability in the data, which limits the strength of these findings. In particular, the independent variables of the study were able to explain 22% of the variability in female participation in civil engineering jobs and 21% for warehousing and support activities, after adjusting the coefficient of determination for the number of covariates. The variables selected were unable to explain much of the variance for the land transport and pipeline sector (5%) nor for the water transport sector (7%). The remaining models (1, 6 and 7) had adjusted R^2 values of around 10% (Table 7).

One of the limitations encountered when trying to improve the selection of covariates was the need for harmonious time-series data from a global representation of countries. Investments in collecting pertinent data at the global level are needed to improve the ability to obtain quantitative insights on the reasons for persisting gender gaps. For example, many countries have gender-segregated data on the percentage of the working population that are managers, but very few have this breakdown by sector, which limits the understanding of how vertical and horizontal segregations of the workforce are interacting.

Discussions and policy insights

This study has shown that better access to education and training, an increase in STEM tertiary attainment rate, and the broader participation of women in the workforce beyond transport are statistically significant in improving gender equality in the transport workforce as a whole. Education and training in the right skills remain an important factor in increasing women's participation in the transport workforce. However, despite an increase in women pursuing tertiary education globally, a gender gap in employment rate still exists between highly educated women and men (ILO, 2019a). The presence of more women in the workforce in general will increase the level of women's participation in the transport workforce. Yet, the global percentage of women participating in the workforce has decreased from approximately 51% in 1990 to 48% in 2019 (World Bank, 2019a). In this study, a similar trend was found between 2008-18, where women's participation in the transport sector declined from 20% to 18%. Men's participating rate in the total workforce has also decreased during the same period but at 75%, it is still 27% higher than women's in 2019 (World Bank, 2019b). If women's participation in the workforce in general continues to decline, the participation of women in the transport workforce will no doubt follow, which has been observed in some of the countries included in this study. This will especially be the case if policies to improve working conditions and support the elimination of gender stereotyping are not implemented.

The GDP per capita also has a statistically significant and positive correlation with women's participation in the transport workforce. This is reflected in the higher levels of women's participation in countries with higher GDP per capita levels. An increase in the GDP per capita of a country over time will also be able to positively influence women's participation rate, but not in all transport divisions. It takes more than economic growth to improve gender equality and in fact countries with lower GDP per capita could also have higher levels of women's participation rate in the transport workforce. Appropriate policies that address the access to and the quality of education and training, as well as working conditions will need to be implemented at the same time in order to attract and retain well-qualified women in the workforce.

On the other hand, the two labour laws included in this study, i.e. maternal leave and equal pay, are statistically insignificant in the panel linear regression analysis. Current laws appear to be insufficient in increasing women's participation in the workforce. This could be due to the missing data on the type of law enacted and the enforcement of the law. A parental leave of two weeks will have a different impact on employment compared to one of nine months. The enforcement of parental leave would also need to be consistent across the transport sector in different parts of the world, especially for paternity leave, which is still not widely utilised compared to maternity leave due to social stigma as a result of gender stereotyping (Rudman and Mescher, 2013).

There are also negative attitudes towards paternity leave (Miyajima and Yamaguchi, 2017). For example, in Japan, the utilisation of paternity leave is at less than 3% (Miyajima and Yamaguchi, 2017), while in the Nordic countries, who pioneered the concept of paternity leave in the 1970s, approximately 60-80 fathers per 100 children born take paternity leave (Haataja, 2009). These two groups of countries are the extremes of a full spectrum of varying uses of paternity leave among countries. Hence, while laws may form an important foundation for equality, they remain a basis upon which other measures should be taken to ensure their effectiveness. For example, encouraging male managers to take paternity leave can have a trickle-down effect that shifts gender stereotypes within an organisation. Training courses on gender discrimination can also raise awareness of biases in hiring, retaining and promoting employees, which can lead to greater diversity in the workforce.

Data limitations continue to pose a challenge for more detailed analysis. The core quantitative analysis of this study is based on national level data, but even on a national level, women's annual transport workforce participation levels have not been measured over the past decade for many countries, especially in the Middle East, Africa and Asia. Data concerning key variables that are significant to the level of women's participation in the workforce are also missing detailed nuances, which could provide additional insights and help shape future transport policies. For example, data by transport job division on wages by gender, number of working hours by gender, or the number of paid and unpaid working hours by gender do not exist for most countries. There are also no systematic structures in place to collect, evaluate and share data and information on successful measures that the private sector has implemented to improve gender equality. Closing the gender gap in the transport workforce may be the responsibility of transport ministries and authorities but the collection of relevant data on labour characteristics or the access to and the quality of education and training opportunities are often constrained within the boundaries of labour and education ministries respectively.

Key recommendations that can address the above-mentioned challenges are described below.

Implement an integrated and collaborative approach to close data gaps

Gender gaps exist in all countries due to various reasons and solutions are multifaceted. Data are required to address working conditions and gender norms and stereotypes, which cut across the education, training, hiring and retaining of women, as well as labour laws. Effective policies would therefore need to be integrated across these areas and designed to create a collaborative and multi-stakeholder approach. This collaborative approach would need to be applied from data collection and sharing to the design, implementation and enforcement of policies. For example, transport ministries would need to work with labour ministries to ensure that the data collected from the transport workforce are gender disaggregated and are able to reflect gender equality issues that may be specific to the transport sector and the problems that need to be resolved. In particular, data on the different ways in which current working conditions affect women and men are important to collect. Identifying the right kind of data to collect across sectors will not only help the transport sector gain a better understanding of how to increase women's representation in the sector, it will also reveal male-biased measures that are not designed for 40% of the global labour force who are female (World Bank, 2019c).

Increase stakeholder engagement beyond the transport sector

Low levels of women's participation in the transport workforce is a complex problem, particularly when it concerns gender stereotyping, which intersects with the broader society. This is not a problem that the transport sector alone can solve. The cross-cutting nature of gender equality requires multi-ministry and multi-stakeholder engagement. In addition to labour ministries, transport ministries would need to co-ordinate with line ministries responsible for education, culture, media, and communications to develop comprehensive strategies jointly to improve gender equality in the transport workforce. It is also necessary to engage relevant governmental and non-governmental stakeholders to ensure an inclusive development of gender equality policies in both the public and private sectors. Furthermore, the private sector and democratic unions need to be included in any efforts to change recruiting techniques and workplace behaviours to increase the hiring and retainment of women in the transport sector.

Proactive measures have helped to increase women's participation and representation in the internal governance structures of intergovernmental organisations, ministries, trade unions and other types of organisation. Women need to be provided with a voice and representation. Despite evidence suggesting that the presence of women in the collective bargaining process is important to achieving outcomes that benefit women, under-representation of women is a reality in national social dialogue between institutions, such as economic and social councils, tripartite commissions and labour advisory boards (ILO, 2019a).

In order to encourage more women to specialise in STEM disciplines and in transport-specific professions more generally, the transport sector (i.e. both private companies and public authorities) could increase the awareness of the broad range of job opportunities available in the transport sector by working jointly with schools. For example, education programmes focused on STEM disciplines can feature job opportunities in the transport sector using female role models. Internships and apprenticeship training programmes offered by educational institutions could be aligned and tailored to meet the recruitment needs of the transport sector and be made equitably accessible to both men and women (Baruah, 2019). In addition, partnerships between companies or governments and education institutions can also be established to demonstrate possible career pathways in the transport sector to students. Specific partnerships and practices include mentoring services, outreach, site tours, student networks, and temporary work placements (Baruah, 2019).

Although STEM tertiary attainment rate was the only discipline included in this study as a variable, the range of job opportunities the transport sector is diverse. Hence, the sector should not just focus on STEM related job opportunities but also highlight the diversity of the sector when increasing awareness. Early outreach is important with schools, universities, networks and associations as a means of engaging with girls and women from a young age (ITF, 2019). More female students could be provided with entry points into the transport sector if internships in fields such as, urban planning, environmental science, public policy and administration, law and business were better aligned with the transport sector (Baruah, 2019).

Align international standards with complementary national policies

National labour laws will be more effective if they are consistently enforced and coupled with complementary policies. The two labour law examples included in this study are maternity leave and equal pay laws, which have both been found to be insignificant in increasing women's participation in the transport workforce as a whole (Table 7). Despite 70 years of international labour standards, women's participation in the transport workforce remains low. This is mainly due to the fact that although many countries ratify the ILO conventions, not all pass national laws that give full effect to the principles in the international standards (ILO, 2019a).

International labour laws and standards describe general guiding principles, such as equal pay, equal opportunity and treatment between women and men, and are only designed to be minimum standards (ILO, 2007). Individual countries can thus provide a higher level of protection, such as a longer period of maternity leave, childcare support and other benefits. Full implementation in the form of national laws and regulations are therefore critical to the successful application of such international standards. For example, the European Community has adopted various directives concerning equal pay, equal treatment of women and men at the workplace, statutory social security, occupational pension schemes, maternity protection, parental leave, part-time work and the burden of proof in sex discrimination cases (ILO, 2007). Such examples are not typical across the world, which may also explain the higher than global average of women's participation rate in the transport workforce in the European Union.

Conclusion

New skills are required to develop sustainable, resilient and inclusive transport systems. The transport workforce needs to evolve to prepare for a future that is diverse, heavily digitalised and under increased climate change pressure. Ongoing and foreseen staff shortages in some areas of transport also make it important to focus recruitment on 100% of the labour market (ITF, 2019). In order to achieve such goals, the opportunities to enter and advance in the transport workforce need to be equal for all.

The current gender gap in the transport workforce is a complex challenge that requires a collective effort between the transport sector and others, such as education, labour and media, to develop a comprehensive strategy that considers all the different factors that have led to the current gap. Although not included within the scope of this study, it is also acknowledged that the lower representation of women in the workforce reflects their higher representation in unpaid work. Due to the historical male dominance in the sector, increasing female participation could encounter various setbacks before parity is reached. It is imperative for countries and companies to invest in closing the gender gap in the transport workforce and involving more women in decision-making processes. Greater diversity and hence perspectives in the workforce will bring immense social, economic and environmental benefits, and increased participation of women in the workforce will benefit not just women as transport employees and users but also men.

The lack of relevant data available remains a key limitation of this study and the advancement of this field more generally. Improving data collection of relevant variables and conducting mixed-methods research in the future will be critical to refining the understanding and measuring of progress in creating a more equal and diverse transport workforce. Future studies could consider more detailed breakdowns of gender differences in employment by type of job, considering also the hierarchy of occupations beyond simply managers and subordinates. The more women who are able to move up the hierarchy in transport sectors, the more they can serve as role models for others and help change gender norms in the field. A better understanding of such trends can reveal success factors and limitations that are responsible for the current gender gap in the transport workforce.

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International Transport Forum

The Gender Dimension of the Transport Workforce

Women remain underrepresented in most transport-related industries, with only 17% female employees on average across a sample of 46 countries. Both attracting and retaining them remains a challenge for governments and the private sector. This study provides an in-depth analysis of the correlation between female participation in the transport workforce and variables such as GDP per capita, education and labour laws. It also provides recommendations on how to develop policies and measures that will enable gender equality in the transport workforce.

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