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The role of multinational and trading enterprises in the gender pay gap: Evidence from Finland

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Abstract

This paper constructs and analyses a set of novel indicators on gender equality in the business sector, which focus on multinational enterprises and foreign traders. The descriptive data tables are drawn from the rich linked statistical registers available at Statistics Finland. The analysis reveals large differences in the share of women and men employed in the best paying professions, such as in managerial jobs, and in professions requiring science, technology, engineering or mathematics degrees, or deep digital competencies. However, while a sizeable gender pay gap in the business sector is identified in high-paying occupations, and in multinational enterprises in particular, the gap is smaller in domestically owned businesses. The gender pay gap tends to be larger in high-paying jobs in foreign multinationals and in enterprises that trade internationally. Based on the statistics presented, the analyses suggest that economic globalization tends to magnify gender inequalities in the Finnish labour market. This paper contributes to the field of official statistics by providing a blueprint, showing how business statistics and social statistics can be linked to enable an analysis of gender inequalities in the labour market.

Keywords: MNE; FDI; international trade; gender equality; official statistics

1. Introduction

How is gender equality achieved in the business sector? This question is perhaps the most fundamental question to answer in the effort of moving towards women's economic empowerment and the global development agenda, including the Addis Ababa Action Agenda and the 2030 Agenda for Sustainable Development. Studies have shown that economic empowerment is one of the most important explanatory drivers of gender equality more broadly (Barnat et. al, 2019).

A key challenge to be confronted in trying to answer this question is data availability. While national statistical offices have compiled an impressive collection of statistics describing time-use, living conditions, employment and other metrics disaggregated by gender, the link between gender outcomes and the wealth generating apparatus of global economies, i.e. multinational enterprises and international trade, has not been addressed to date.

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[1] We would like to thank Statistics Finland and in particular, Pontus Lindroos, for invaluable help with the data. We would also like to acknowledge the work of the "Nordic countries in value creation of global firms" project carried out by the Nordic statistical offices for inspiration, and Lennart Stenberg for suggesting a way to define deep digital competences (DDC).

Multinational enterprise groups (MNEs), and business groups in general, are important actors in modern economies. From a welfare point of view, and depending on circumstances, they can be seen as "parasites", or "paragons" (see Khanna and Yafeh, 2007). Carney et al. (2017) provided a meta-analysis of business group literature, and highlighted that further research is still needed to address this question, as addressing the above question is not straightforward, and will depend on context and circumstance. In a similar fashion, the expansion of international trade can bring mixed effects from the welfare point of view (e.g. Bourguignon, 2015); very little data exist to facilitate a systematic analysis of labour market outcomes from a gender perspective.

In this paper, a brief overview of the theory of economic empowerment is provided along with statistical analyses to assess whether the theory has a bearing on the business reality. Descriptive statistical tables are presented, constructed from comprehensive linked Finnish microdata that allow detailed analyses of gender equality in the business sectors, but with a particular focus on MNEs and enterprises that trade internationally. The paper also discusses the largest gender gaps in the Finnish business sector, and outcomes for the labour market.

This paper makes an important contribution to the field of official statistics by providing a blueprint, showing how business statistics and social statistics can be linked to enable an analysis of gender inequalities in the labour market using data provided by the business sector. The proposed statistics capture what effect business types, and in particular, MNEs and foreign traders have on the gendered outcomes in employment. Building on the existing capacity and data held by national statistical offices, this work can help improve statistics describing how societies evolve in the equality dimension and put emphasis on the fact that the business economies and policies promoting growth cannot be analysed in isolation, but rather, a holistic view is needed to assess the impacts on the broader society.

Analysis of the Finnish data reveals large differences in the share of women and men employed in the best paying professions, such as in managerial jobs, and in professions requiring science, technology, engineering or mathematics degrees, or deep digital competencies. However, while a sizeable gender pay[2] gap in the business sector is identified, and in MNEs in particular, the gap is smaller in domestically owned businesses. The gender pay gap tends to be larger in high-paying jobs in foreign multinationals and in enterprises that trade internationally. There are of course exceptions, for example, in professions requiring deep digital skills, where the gap is smaller. In general, based on the statistics presented, the analyses suggest that economic globalization tends to magnify gender inequalities in the Finnish labour market.

The paper is structured as follows: The next section outlines the theoretical basis of gender inequalities in the business sector. Section 3 discusses the data sources, definitions and methodologies used, including proposed indicators to measure gender equality in business and trade. Section 4 presents some descriptive statistics and analyses of gender inequalities in MNEs and Section 5 discusses the robustness of the interpretations. Section 6 provides concluding remarks and reflects on some possible steps forward. All the data tables and figures are placed in Section 7.

2. Economic gender equality

2.1 Economic gender equality on the global agenda

Equality between women and men can be defined as the equal rights, responsibilities and opportunities of women and men, girls and boys. It implies that the interests, needs and priorities of both women and men are taken into consideration, recognising the diversity of different groups of women and men (United Nations, 2001). According to the International Labour Organization (ILO, 2007), gender equality also

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[2] In this article, pay is measured as the sum of wages and salaries.

means that women and men have equal conditions for realising their full human rights and for contributing to, and benefiting from, economic, social, cultural and political development.

While economic participation and empowerment are significant factors of gender equality, gender issues are largely absent from the sphere of economic and business statistics. Traditionally, gender statistics and indices focus on social, cultural and political aspects, rather than fully capturing the economic side. To date, gender statistics have also been disconnected from international trade, a key driver of economic development that is likely to influence gender equality. Economic empowerment is also a relative latecomer to the gender equality discussion, and to the global development agenda.

In 1995, the Beijing Declaration and Platform for Action noted that "insufficient attention to gender analysis has meant that women's contributions and concerns remain too often ignored in economic structures, such as financial markets and institutions, labour markets..." and "as a result, many policies and programmes may continue to contribute to inequalities between women and men" (United Nations, 1995, para. 155). The Platform for Action called for statistics "on the full contribution of women and men to the economy, including the informal sectors" (United Nations, 1995, para. 206).

In 2015, the Addis Ababa Action Agenda strengthened the focus on women's economic empowerment by stating that "evidence shows that gender equality, women's empowerment and women's full and equal participation and leadership in the economy are vital to achieve sustainable development and significantly enhance economic growth and productivity" (United Nations, 2015a, para. 21). It also recognised "the critical role of women as producers and traders" (United Nations, 2015a, para. 90) and the importance of facilitating "women's equal and active participation in domestic, regional and international trade".

The 2030 Agenda (United Nations, 2015b) took a broader view of gender equality than its predecessor, the Millennium Development Goals. It seeks, for instance, recognition of the contribution and value of unpaid and domestic work, and to ensure that women can fully participate in economic, political, social and public life at all levels, including access to economic, financial and technological resources[3].

2.2 What do we know already?

Braunstein (2017) identifies a two-way causality between gender equality and economic growth: Economic growth affects gender equality in many ways, but gender biases also influence macroeconomic outcomes, such as growth, trade, trade deficit and inflation. Gender equality and other types of economic inequalities also affect the business environment and the choice of strategy, including trade strategies for competitiveness (see for instance Fontana, 2014).

Several researchers (Dollar & Gatti, 1999; Klasen & Lamanna, 2009) have found that economic growth benefits from improved gender equality, for instance in education, employment and access to finance. An analysis of 92 countries (Busse & Spielmann, 2005) showed that gender inequality in labour force activity and educational attainment was negatively linked with the comparative advantage of labour-intensive industries. But it also found that businesses producing labour-intensive goods may base their comparative advantage on women's lower wages. Countries with a larger gender wage gap had higher exports of labour-intensive goods. To understand these dynamics, one needs to consider at least the gender pay gap, labour force participation and education.

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[3] https://unstats.un.org/sdgs/metadata/

The opposite effects illustrate the complex interrelation of gender equality and the economy. The picture is also further complicated by international trade that reflects the different roles and comparative advantages of countries in the global economy. It has long been recognised by development economists that international trade has an impact on development. Whether one subscribes to the Ricardian orthodoxy that free trade is key (see Friedman, M. & Friedman, RD., 1990; Friedman, TL., 2005), or veers towards a more heterodox view that, depending on a variety of circumstances, trade creates winners and losers (e.g. Stiglitz, 2002; Sachs, 2005; Piketty, 2014; Bourguignon, 2015); either way, it is accepted that trade plays an important role in development. The importance of that role is widely accepted today—see Monterrey Consensus (United Nations, 2012). In fact, reviewing the progress made by development economics, the eminent economist Sir Arthur Lewis (quoted in Yergin and Stanislaw, 1998) identified the underestimation of the power of international trade to propel growth as a fundamental and costly error.

Over the years, UNCTAD (e.g. 2004) has studied the impacts of trade liberalisation and noted that it may strengthen financial independence and agency of women at the household level in addition to providing income and employment opportunities. However, increased international competition can also push wages down, especially for employees in low-skilled jobs without strong bargaining power. Trade may affect women and men positively or negatively depending on the sector; whether the sector expands or contracts in production; and depending on how international competition affects the local labour market.

Some of the gendered outcomes of trade relate to the differences in how women and men participate in trade or in the labour force. According to the Organisation for Economic Co-operation and Development (OECD)'s analysis (2018) of gender in global value chains, men's share of jobs in exporting firms was relatively high, while women were more often employed by suppliers of the exporting firms. Women's jobs are also much more often situated in the service sector, rather than in manufacturing (UNCTAD, 2017). This implies that in addition to participation rates, gender equality outcomes depend on the sector, status in employment and types of jobs held by women and men.

High gender equality is not necessarily a guarantee of equality in trade. Kucera and Milberg (2000) found that the expansion of trade between OECD countries and developing economies between 1978 and 1995 resulted in disproportionate job losses for women in OECD countries, as most workers were women in import-competing industries, such as textiles, footwear and leather. Bussolo & De Hoyos (2009) made the same finding for agricultural economies, where women are concentrated in import-competing sectors such as food crop production, and in Africa, where Seguino and Grown (2006) found that tariff reductions on labour-intensive imports resulted in higher job losses for women than for men.

A study by Lindroos, Luomaranta & Nurmi (2019) at Statistics Finland found that the benefits from international trade were not distributed equally between women and men in Finland. In 2016, 18 per cent of entrepreneurs in exporting firms were women, and women accounted for 27 per cent of the labour input of exporting firms on a full-time equivalent basis. The results also showed that female business owners hired more women and more highly skilled women than male business owners. This suggested that lower participation of women in international trade may also exacerbate differences in capital and salary incomes between women and men.

2.3 Measures being adopted to address gender equality concerns

As shown above, businesses benefit from gender equality through high educational attainment and labour force participation and the availability of more highly skilled labour. However, unequal pay may also be a source of competitive advantage. Therefore, governments, like Germany and the United Kingdom, have started to introduce gender pay gap reporting requirements for businesses. In the United Kingdom, the Equality Act (in force since 6 April 2017) made it compulsory for public bodies and private companies with more than 250 employees to report their gender pay gap figures annually. Significant pay gaps disclosed

since then have provoked much public reaction and action by company CEOs. Many other countries are also following or looking to follow this approach.

France introduced a Gender Equality Index for Companies in 2019 which covered businesses with over 1000 employees[4]. Since March 2020, it applies to all organisations with more than 50 employees. The Degree defines the methodology of company level indices including data on gender pay gap, gender equality in salary increases, promotion, salary increases to women returning from maternity leave and the share of under-represented gender among the 10 most highly paid individuals. Companies reporting a persistent gender pay gap will have to set aside some gender equality funds approved by local employee representatives. Organizations with persisting scores below 75 points, out of a maximum score of 100, could face fines of up to 1 per cent of the company's payroll.

Bloomberg has also introduced a Gender Equality Index and invites companies to voluntarily participate in it. Now it covers 325 companies headquartered in 42 countries[5]. Their analysis reveals among other things that female-led companies have more women in other top roles.

The World Bank introduced in 2019 a Women, Business and the Law Index which now spans 190 economies. The index analyses laws and regulations affecting women's economic inclusion and is structured around eight sub-indicators that cover different stages of women's working life and have significance for the economic standing of women (World Bank, 2019). It shows that high-income countries tended to have the best scores, leaving women in many other countries with only a fraction of the rights of men.

The Women's Economic Opportunity Index (WEOI), was compiled by the Economist Intelligence Unit (EIU) looking beyond gender disparities to the underlying factors affecting women's access to economic opportunity in the formal economy (Economist Intelligence Unit, 2012). The index was first published in 2010 by EIU in cooperation with the World Bank. The index looked at: labour policy and practice; access to finance; education and training; women's legal & social status; and the general business environment, but it has not been updated since 2012. In other global gender equality indices, the economic aspect of gender equality often boils down to the labour force participation of women and the gender wage gap.

The above snapshot of research shows that the question of gender equality in business and the economy is essential, an area where more can be done for gender equality and one that has not yet been exhausted with data and statistics. We do not know enough about gender equality in the business sector and the economy. The conditions seem to vary by country and sector, depending on the skills, education and segregation of the labour force and the specific conditions in each business.

3. From data sources to indicators

This paper draws on the rich data sources and registers available at Statistics Finland to analyse gender equality in the Finnish business sector. We link data from a number of statistical registers held by Statistics Finland. The key ingredient for linking data is the unique business identifier that allows consistent identification of an enterprise across the different data sources. In Finland, the business identifier is given by the tax administration, and can be used by the enterprise for any administrative purposes when dealing with the government. The importance of single business identifiers, and data infrastructure more broadly, for the development of national statistical systems and addressing the statistical analyses required by

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[4] www.thalesgroup.com/en/group/responsability/news/gender-equality-index-1-march-2019

[5] https://www.bloomberg.com/gei

development economics has been highlighted by MacFeely and Dunne (2014) and MacFeely and Barnat (2017).

Due to the availability of comprehensive administrative registers, the total business population is known, facilitating comparisons between MNEs and domestic enterprises without requiring any imputation or complex weighting strategies. A particular strength of the Finnish statistical registers lies in the fact that even the smallest enterprises are covered, including their ownership type. Unfortunately, similar statistics cannot easily be produced in countries where statistical systems rely only on sample survey data (see Eurostat, 2019).

The approach used in this paper also builds on related initiatives by Eurostat (2019) as well as the OECD work on trade in goods statistics by enterprise characteristics (TEC). The latter aims to bridge two major statistical domains which have traditionally been compiled and used separately: business statistics and international trade in goods statistics. The initiative helps statisticians compile indicators on the kind of businesses involved in international trade. It breaks trade in goods down by economic activity, size of enterprises, trading status, geographical diversification and products traded. In our approach, these data are combined further with information on business ownership and dependencies and link it all with gender data.

3.1 Statistical data sources

Statistical Business Register (SBR)

The Statistical Business Register (SBR) contains a limited number of variables for the full population of enterprises. It is crucial to the foundation of nearly all business statistics. This is because the register contains information on the sector of activity of enterprises. Moreover, in the European Statistical System, the SBR contains comprehensive data on the different statistical units and the linkages between them. Thus, information on enterprise group structures can be extracted, pinpointing whether a given enterprise is independent (stand-alone enterprise) or dependent (belongs to a group).

Structural Business Statistics (SBS)

Structural Business Statistics (SBS) describe the structure, activity and competitiveness of businesses in NACE[6] sectors B to J and L to N and Division 95. Variables include performance indicators, such as, gross value added at factor cost, turnover, total purchases of goods and services, and labour input variables, such as, persons employed. These variables are used to measure labour productivity, export intensity and import intensity of each enterprise.

Foreign Affiliate Statistics (FATS)

Inward Foreign Affiliate Statistics (IFATS), also called Inward FATS, are a subset of SBS and is typically derived from administrative sources and the SBR. IFATS describe the ownership of an enterprise, i.e. whether an enterprise is foreign owned or not; the ultimate controlling institutional unit (UCI) defines the country of ownership. In addition, European statistical producers are required to compile Outward FATS, which detail the geographic distribution of domestically-controlled affiliates abroad. In Finland, these statistics are based on full enumeration of all known legal units with foreign affiliates. In principle, the data represent the total population of business enterprises, and contain all control links.

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[6] NACE: the Statistical Classification of Economic Activities in the European Community, is referred to as NACE (*nomenclature statistique des activités économiques dans la Communauté européenne*), is the industry classification system used in the European Union. It is equivalent to the UN International Standard Industrial Classification of All Economic Activities (*ISIC*) classification.

Thus, IFATS and OFATS registers together with the SBR allow us to identify which businesses are: independent; domestically-controlled dependent enterprises without affiliates abroad; domestically-controlled dependent enterprises with affiliates abroad; and foreign affiliates.

International Trade in Goods Statistics (ITGS)

International trade in goods statistics (ITGS) record physical movement of goods between countries. In the European Union, international trade comprises both intra-EU and extra-EU trade. There is an important limitation regarding the intra-EU trade, as the administrative records collected by the customs do not include information on foreign trade for amounts below Intrastat limits. A system of minimum thresholds is used to simplify data collection and to reduce the burden placed on trading enterprises. A further complication for any analysis of international trade in goods, is that each EU member state has its own threshold, separately for imports and exports. On the other hand, extra-EU trade statistics do not have such a limitation. For Finland, the Intrastat-limit is €600,000 for both imports and exports in 2020[7]. For this reason, additional information on Value-Added Tax (VAT) are obtained in order to identify traders. These data are available from tax administration, and they contain total sales from enterprises that can be allocated to trade in goods or services if the trading partner is located within EU.

International Trade in Services (ITS)

The International Trade in Services statistics are based on a survey of around 2,000 enterprises, and thus does not provide full coverage of the business sector. However, since the concentration of business activities is very high in Finland, Statistics Finland is able to capture around 80 per cent of trade in services from the survey. In addition, the VAT data can again be used to identify intra-EU service trade, thus capturing some, if not all, of the small firms that are engaged in services trade.

Combined employer-employee data (FOLK)

Statistics Finland has created a linked employer-employee data set (Finnish Longitudinal Employer-Employee Data, FOLK) for research use; similar data sets are increasingly available worldwide (e.g. Hammermesh, 2007) accelerating the momentum of studies that are trying to understand micro-foundations of firm outcomes and income inequalities. The data include information on each person's basic characteristics, such as, family characteristics, living arrangements, employment relationships, income and educational attainment. These data are constructed by combining Statistics Finland's employment and social statistics. For the purposes of this paper, variables indicating each worker's sex and wages and salaries are linked with their corresponding employer. In addition, the educational qualifications (ISCED-F) and the employment classification (ISCO) of each employee are matched.

3.2 Definitions and analytical groupings

The paper proposes various definitions that are useful for measuring and understanding the different roles enterprises may have in creating gendered outcomes in the labour market. An important limitation in this paper, common to most analyses coming from a national perspective, is that analyses of MNEs is necessarily partial i.e. analyses are limited to the activities of MNEs reported in that country – the domestic portion of MNE activity.

This problem has been circumvented by defining enterprises as being either independent or dependent on some other enterprise (multinational or not), allowing an analysis at the enterprise level to be conducted. In this way, it is possible to look at the effects of MNEs, but using comparable analytical units, namely the

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[7] https://tulli.fi/en/intrastat/who-provides-intrastat-information

enterprise and its domestic activities and employees. In the definitions proposed below, the guidelines published by Eurostat (Eurostat, 2019) for microdata linking are broadly followed.

Enterprise relations

Enterprise relations are based on domestic relations (SBR), outward relations (OFATS) or inward relations (IFATS)

non-MNEs:

- are independent i.e. a stand-alone enterprise. It does not control[8] any other enterprise or is not controlled by another enterprise; or

- are dependent on domestic group i.e. the enterprise is controlled by a domestic group, or a domestic parent without affiliates abroad.

MNEs:

- are dependent on a domestic international group i.e. enterprise is controlled by a domestic group, or a domestic parent with foreign affiliates in OFATS; or

- are dependent on an international group i.e. enterprise is controlled by a foreign group, and therefore found in IFATS.

Trader typology

Using definitions presented in Eurostat (2019), a trader typology is applied to group enterprises based on their participation in foreign trade in goods and services. Each category represents the different roles enterprises may have in international trade in linking the domestic economy to foreign markets. The cut-off thresholds and the intensity rules, explained below, are in place, to group enterprises that engage in similar patterns of international trade as a part of their business model:

- Exporter only: Enterprise has exports exceeding €5,000 and its export intensity i.e. the export share of total turnover, exceeds 5 per cent.

- Importer only: Enterprise has imports exceeding €5,000 and import intensity i.e. the import share of total purchases, exceeds5 per cent.

- Two-way-traders: Enterprise satisfies thresholds for both exporter and importer. This category of enterprise is sometimes referred to as a global value chain (GVC) firm.

- Non-traders: Enterprise has no exports or imports.

Unlike the Eurostat (2019) guidelines, for this study, *occasional traders* are grouped together with *non-traders* for analytical tractability.

Skill categories and industry groupings

In addition, special analytical groupings are of interest for analysing the impact of MNEs and international trade on the gendered outcomes in working-life. For instance, employees with science, technology,

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[8] Control is defined as having at least 50 per cent of voting rights directly or indirectly.

engineering and mathematics (STEM) education are expected to benefit from globalization and international trade, owing to an increased skill-premium (e.g. Burstein et al., 2011) and this is where the gender pay gap is found to be largest among professions (see, e.g., Kahn & Kinther, 2017 for a review of this literature). In addition, the new wave of globalization "Globalization 4.0" is said to be driven by digitalization and computer competences. Hence, the interest in deep digital competences (DDC), a category that attempts to delineate those educated with deeper digital skills from the standard STEM educated employees, at least as a proxy. For example, Michaels, Natraj & Van Reenen (2014) provide evidence that job polarisation is related to ICT development.

The International Standard Industrial Classification of All Economic Activities (ISIC) assigned to each firm (NACE rev.2 in Europe) enables a focus on certain productive industries and jobs. Businesses belonging to the sector *knowledge intensive services* (KIS)[9] are among the most productive enterprises, and this makes it an important category to analyse from the gender perspective. Manufacturing enterprises, on the other hand, are of particular interest as they typically trade internationally.

The analytical groupings related to higher skill requirements reveal evidence of labour force polarization in the high-end of the job distribution, and the gendered outcomes of working life e.g. reveals whether jobs with high salaries are more often dominated by men. Data from the U.S. suggests that the upper tail of the pay distribution is precisely where the pay gap is largest and has shrunk the least from 1980 to 2010 (see Blau & Kahn, 2017 for evidence).

- STEM fields based on the International standard classification of education (ISCED-F)[10] include: 511, 512, 531, 532, 533, 541, 542, 612, 613, 711, 712, 713, 714, 715, 716, 721, 722, 723, 724, 731, 732.

- DDC is a subset of STEM and includes ISCED-F codes: 533, 541, 542, 612, 613, 711, 713, 714.

- The International Standard Classification of Occupations (ISCO) major groups (1-digit level) is used to compare women and men occupying similar roles within enterprises.

- KIS is a grouping defined by Eurostat to identify enterprises with high expertise requirements in the service sector; it is based on the NACE activity classification of each enterprise[11].

- Manufacturing enterprises include NACE 2-digit categories 10-33.

- Other industries that fall outside KIS and manufacturing is an interesting category, since it is predominantly composed of (wholesale and retail) trade enterprises and other service enterprises, which employ many sales and service workers, known to have a large representation of women.

Of course, one could select different categories of analyses. For example, manufacturing industries can be split further by technological requirements (e.g. high tech, low tech), or one could examine more disaggregated statistics. The categories selected for this analysis are based on ex-ante understanding of what sheds light on the gender inequality issue.

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[9] https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Knowledge-intensive_services_(KIS)

[10] http://egracons.eu/sites/default/files/Isced%202013%20fields%20of%20education%20code%20list.pdf

[11] https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Knowledge-intensive_services_(KIS)

3.3 Indicators

Four main indicators are used to contrast the roles of women and men in different types of enterprises.

1) Average women's pay in a given category

2) Average men's pay in a given category

3) Share of women in the total workforce in a given category

4) Women's pay as a percentage of men's pay in a category

These indicators, when analysed using the aforementioned analytical groupings, provide a fairly comprehensive view of the participation of women in the most productive and lucrative professions, and of the inequalities in pay that exist in the selected categories and overall, in the business sector. Moreover, NSO can compile these indicators easily, provided comparable data are available.

Pay inequalities are assessed using two channels: (1) gender segregation and (2) pay differentials within the same professional category or within the same education grouping. In Finland, based on earlier research we expect both of these effects to be relevant.

This observation is backed by Korkeamäki & Kyyrä (2006), who use detailed employer-employee data from the manufacturing sector to research the origins of the gender pay gap. The authors find that almost 60 per cent of the gender pay gap is explainable by segregation, and adding controls for workers' human resource characteristics, i.e. education and experience, reduces the gender pay gap by another 10 per cent. The rest, roughly 30 per cent of the pay gap (6 %-points) remained unexplained. This can be interpreted as women and men receiving different salaries in the same occupation and firm. Our analysis looks at pay differentials within the same profession and industry, not taking into account differences due to the level of professional experience or other confounding factors.

Some other early Finnish evidence of the gender pay gap evolution is presented in Ilmakunnas and Maliranta (2005). The authors point out that, on average, there are relatively more men employed in the most profitable companies, even within an industry. This highlights the importance of understanding gender-based segregation *within* an industry, not just segregation *between* industries. Therefore, different types of businesses within industries are examined in this study.

When discussing trading enterprises and MNEs, there might be circumstances that favour men due to unequal distribution of time-use within households (see, e.g., Cerrato & Cifre, 2018 for evidence on time-use). For instance, traveling might be more difficult for women who are often more time-constrained due to having more domestic responsibilities (Bøler et al., 2018 show evidence of this). This mechanism increases the gender pay gap especially among the skilled workers.

Equipped with these analytical groupings and indicators, some descriptive statistics are presented. The following section provides first an overview of the structure of the Finnish corporate sector and, in particular, the types of productive employment provided by MNEs and international traders. An analysis of gender equality and how employment with an MNE or a trading enterprise imply different outcomes for women and men is also presented.

4. Gender equality in the Finnish business sector

4.1 The Finnish business sector in numbers. Where are the "best" jobs?

The Finnish economy can be characterized as highly industrialized and open. The business sector employs around 74 per cent of the workforce, according to the latest employment statistics (Statistics Finland, December 2019). Due to the small size of the domestic economy, export markets are an important driver of growth and development for Finnish businesses. Access to international markets for Finnish multinational enterprises have been tightly linked to the success in developing a thriving Finnish high-tech industrial cluster and knowledge-base. On the other hand, the negative effects of international competition through its largest multinational enterprises (Fornaro & Luomaranta, 2018) have also been strongly felt. Job losses in the aftermath of difficulties in the mobile phone industry serve as a reminder of the risks arising from the dependency on a few multinational enterprises.

Table 1 provides some key characteristics of the Finnish business population and provides context to the employment statistics that will follow. Throughout this paper, statistics are aggregated as averages over the years 2008-2016, since most of the relevant variation is found between the different types of enterprises, instead of within categories over time. Exploiting the time series dimension is left for future work. In addition, enterprises with only 1 employee (often the entrepreneur) are excluded in order to keep the focus on employer enterprises and pay gaps therein. Exclusion of one-person companies is driven by data quality considerations, as it is much harder to determine what the wages and salaries are in those enterprises (entrepreneur may for instance pay dividends or accrue retained earnings). Another important exclusion is that only full-time employees are included, since the inclusion of part-time workers hampers the comparison between women and men as women are more likely to be employed on a part-time basis. If anything, this choice makes the gender pay gap appear smaller in the analysis that follows.

Columns 1-2 of table 1 presents the composition of the Finnish business sector. Multinational enterprises account for only a tiny fraction of the business population in Finland, representing roughly 4 per cent of businesses. The majority of businesses (almost 76%) are not involved in foreign trade in any way. Of those that do trade internationally: almost 3% export only; about 16% import only; and 6 per cent are two-way traders i.e. involved in both exports and imports.

In terms of size, a small fraction (less than 1%) of businesses are large, employing more than 250 persons. Medium-sized enterprises i.e. those employing 50-250 persons, account for 3.6 per cent of the business population and small firms about 20 per cent. Micro-sized enterprises account for the vast majority of businesses in Finland – roughly 75%.

A large share of enterprises is found in the service sector (almost 44 per cent). Trade, construction and manufacturing industries account for roughly 24, 16, and 16 per cent of business enterprises respectively.

Table 2 highlights the types of enterprises by dependency and ownership enabling the identification of the most productive businesses that can, thus, provide the highest paying jobs. In the first section of table 2, column 2 shows that foreign owned multinational enterprises are almost twice as productive as independent enterprises, and domestically owned MNEs are not far behind foreign MNEs. In columns 3-4, average salaries naturally reflect this productivity gap. Foreign owned MNEs pay on average €58,292 to male workers (column 3), while female employees receive on average €41,499 (column 4). These salaries are broadly similar to those paid by domestic MNEs. Thus, MNEs pay more than a 30 per cent premium compared with average salaries in the non-MNE business sector.

Table 2 provides statistics by NACE category too. Foreign owned multinationals are most often situated in trade (42%), and services (34%). Domestic MNEs, on the other hand, are mostly located in manufacturing

(45%), and services (31%). Independent enterprises are typically small and concentrated in the services sector (44%), similarly to domestic enterprise groups (45%).

Multinational enterprises are also active in foreign trade, reflecting their superior capacity to overcome trade barriers, and highlighting their role in linking the Finnish economy to international markets. The section on trading status in table 2 shows that domestic MNEs are most often two-way traders (45%), followed by foreign MNEs, in which category, 32 per cent are two-way traders.

The section on skills in table 2 shows that a function of the higher salary levels paid by foreign MNEs, are the higher skilled workforce employed, as on average, 20 per cent of their employees are defined as *professionals* by the ISCO classification. In addition, almost 40 per cent of their workforce have received a STEM education and 12 per cent have received a DDC education. This contrasts with independent enterprises, where only 11 per cent of employees are professionals, 33 per cent have a STEM degree, and 7 per cent have a DDC degree.

4.2 Multinationals and gender inequality

The overall female participation rate in the business sector is only 36 per cent (Gender differences section of table 2). Women are more often employed in the public sector, according to Statistics Finland's employment statistics, they were 72 per cent of public sector workers in 2018 (Statistics Finland, December 2019)). In addition, according to the latest unemployment statistics (March 2020), the unemployment rate for women is lower than for men; 7.5 per cent for men, and 6.2 per cent for women (Statistics Finland 2020)).

The simple descriptive statistics in the final section of table 2 reveal firm heterogeneities from a gender equality perspective. While independent enterprises have a slightly lower female participation rate than the average 36 per cent (-2.7 percentage points difference), domestic groups have a higher female participation rate than the average (1.5 percentage points difference); around the same as domestic MNEs. In foreign owned MNEs, female participation rates are around the same as the average for the business sector as a whole.

Multinational enterprises, as seen in table 2, are capable of providing highly productive employment and, thus, tend to pay the highest salaries. Figures 1 and 2 together with Table 3 provide important insights into gendered outcomes in the labour market, and into the gender pay gap discussion. Figure 1 shows that in the manufacturing sector, women's salary is 84 per cent of men's salary in independent firms, it is only 71 per cent in domestically owned MNEs and 77 per cent in foreign owned MNEs active in Finland. The ratio is 81 per cent in domestic enterprise groups. Figure 2 considers the salary differences in KIS and shows that in that sector women's salaries are 77 per cent of men's salaries in independent firms, 73 per cent in domestic groups, 70 per cent in domestic and foreign MNEs.

While MNEs are more productive and can in principle pay equal salaries, table 3 shows that on the contrary, the gender pay gap is larger in MNEs than in other businesses (columns 7-12). However, both women and men receive a significant boost in their salary levels in multinationals. Women earn on average almost 50 per cent higher salaries, while men earn 60 per cent higher salaries, when foreign owned multinationals are compared to independent enterprises in the manufacturing sector. The largest pay gap is found in foreign owned knowledge intensive services (KIS), when all Finnish employees are grouped together.

It is clear from table 3 in columns 2, 5, 8 and 11 that enterprises in knowledge intensive services pay the highest salaries. This observation holds for all the enterprise relation breakdowns, i.e. independent businesses similarly to MNEs. Foreign owned MNEs pay the highest salaries in KIS, while domestically owned MNEs pay the highest salaries in manufacturing.

Focusing more closely on MNEs, the share of women in persons employed is higher in other activities than KIS and manufacturing, in activities such as retail trade or other services (columns 7-12 in the first section of table 3). In the best paying jobs, such as in KIS, women are in a minority. In KIS, only 32 per cent of the employees in foreign MNEs are women, and a slightly higher share, 35 per cent in domestic MNEs are women. Interestingly, in column 5, the share of women in KIS increases to 37 per cent in domestic enterprise groups (non-MNEs) and to 39 per cent in independent enterprises (column 2). This observation is consistent with the pattern where men account for the bulk of higher paying jobs, and the share of women increases as the average pay decreases.

The section on STEM in table 3, shows that women are underrepresented across the board in science, technology, engineering and mathematics (STEM) jobs, although slightly less so in MNEs. However, the gender pay differences in STEM jobs are larger in multinationals.

Deep digital competence (DDC) professions are clearly dominated by men as seen in table 3, in the section on DDC. Women represent only around 10 per cent of workers in all DDC jobs in the KIS sector (columns 2, 5, 8 and 11), and even less in other industries. This is noteworthy, as these professions are expected to benefit the most from digitalization. Perhaps surprisingly, the gender pay gap is quite small for those who have the DDC degree in manufacturing and KIS in independent firms. In these occupations women earn around 90 per cent of their male counterparts' salaries in independent businesses, on the other hand, in the best paying firm category, foreign MNEs, women's salary is 87,8 per cent in manufacturing, and 76,6 per cent in KIS.

In the section on ISCO-1, table 3 shows that women are poorly represented in managerial level occupations (ISCO-1) across the board. This category includes workers who command the highest pay and are arguably the most influential professionals in the business sector. In MNEs, a little over 20 per cent of managers are women (columns 7-12). Women are slightly more likely to be managers in domestic MNEs (columns 7-9) than in foreign MNEs (columns 10-12). In foreign MNEs active in KIS, 22 per cent of managers are women, compared with 25 per cent in domestic MNEs in the same sector. In manufacturing, the shares of women managers are lower: between 15 and 16 per cent in non-MNEs, 22 per cent in domestic MNEs and 17 per cent in foreign MNEs.

While independent businesses generally provide more equal pay for women and men across the board, this is not always true for managers. In the manufacturing sector, women managers earn 82 per cent of men's salaries in independent businesses (column 1) and 85.4 per cent in domestic enterprise groups (column 4). Domestically owned MNEs, in manufacturing, pay women managers 80 per cent of men's earnings on average (column 7), and foreign owned about 79 per cent (column 10). The gender pay gap is still very large for business managers overall and tends to be larger in multinationals.

Another interesting category from a "quality-job" perspective, is the ISCO-2 category in table 3, which includes highly educated professionals with relatively complex job descriptions. There too, women have a significantly lower participation rate compared with their total labour force participation rate in manufacturing and KIS. On the other hand, the other activities category (columns 3, 6, 9 and 12) have a high representation of women. Looking at MNEs situated in KIS, in both foreign and domestic, the share of women in professional occupations is 28 per cent (columns 8 and 11). The gender pay gap is relatively small in this category overall, but wider for multinational enterprises. For example, in foreign MNEs that are active in KIS, women's salaries are around 77 per cent of men's salaries (column 11), while for independent KIS enterprises the gap is about 84 per cent (column 2). Out of the ISCO-2 categories, women tend to have the highest salaries in multinationals active in other activities (in columns 9 and 12).

The gender pay gap is noticeable among clerical support workers (ISCO-4) too, where women form the majority of the workforce and salary levels are relatively low. In these occupations, the pay gap tends to be

lowest in KIS, where women earn 94,9 per cent of men's salaries in independent businesses (column 2), 91,3 per cent in domestic enterprise groups (column 4), 96,5 per cent in domestic MNEs (column 8) and 84,3 per cent in foreign MNEs (column 11).

Men dominate the best paying jobs in the business sector, while women account for the majority of support functions. MNEs provide jobs that pay well but widen the gender pay gap. The results by occupation show that the gender pay gap persists in Finland across all professions and types of business. While smaller independent businesses are more gender equal in terms of pay in white-collar occupations (ISCO-1 to ISCO-5), they generally pay lower salaries. However, it seems that among the higher paying jobs, female professionals and those working in jobs requiring deep digital skills enjoy quite an equal pay. This highlights the importance of high-level education and encouraging women to enter these fields.

Country of ownership may influence the management practices of an enterprise (e.g. Bloom et al., 2016) as well as salary levels (e.g. Sourafel and Görg, 2007). Evidence from individual and firm level data from Japan (Kodama et al. 2016) points to foreign owned firms having a lower gender pay gap and more female friendly work practices than local firms. In Estonia, on the other hand, Vahter and Masso (2018) find evidence that foreign owned firms have a notably larger gender pay gap than domestically owned firms. The result of a study by Oostendorp (2009) suggests significant transfer of human resource practices and corporate culture through foreign direct investment (FDI) across the over 80 countries studied using aggregated statistics. That study shows a significantly narrowing impact of trade and FDI net inflows on the occupational gender pay gap for low-skill occupations, both in poorer and richer countries, and for high-skill occupations in richer countries, and there is evidence of a widening impact of FDI net inflows on the high-skill occupational gender pay gap in poorer countries.

Figure 3 provides women's / men's salaries broken down by country of origin of the enterprise. The data show interesting variations in the gender pay gap by country of ownership. For instance, domestic enterprise groups (non-MNEs) provide more equal pay, by a large margin, compared with multinational enterprises. Latin American and African owned MNEs, together with Chinese MNEs have the largest differences in salaries paid to women and men overall. This also reflects the structures of the workforce within the enterprises but provides a usable point of comparison for interpreting table 4.

In table 4, in the STEM category, women's salaries are only 56 per cent of men's salary in Latin American or African owned MNEs (column 7). This is similar to Chinese owned MNEs, where women earn only 54 per cent of what men earn on average (column 8). On the other hand, female managers earn more than men in Chinese MNEs, and the same is true for clerical support workers in Latin American or African owned MNEs. While the relationship between country of ownership and gender pay gap is not simple, it is important politically and should be measured, as the consequences of foreign direct investment are not limited to the positive aspects such as employment effects and know-how spill-overs. FDI can also bring foreign business culture and values, which may differ from and affect the existing host country culture.

4.3 Traders and gender equality

Trade participation is at the forefront of policy debate, since it is a significant driver of economic development and welfare. The statistics presented in figure 4 and table 5 provide evidence that indeed both female and male workers employed in trading enterprises enjoy higher salaries. Below, unless otherwise specified, the text refers to columns 3 and 4 that present statistics on two-way traders and non-traders, respectively, and these are also displayed in figure 4 for the most interesting categories of workers (higher skill and white collar workers).

The fact that trader enterprises pay higher salaries goes hand in hand with the observation that labour productivity too, is higher, for instance in two-way trader enterprises - by approximately 28 per cent (the

first section of table 5) compared with non-trader enterprises. In two-way traders, women's salary is 35 per cent higher than in non-traders, and men's salary 40 per cent higher. The gender pay gap is 6 percentage points wider for employees in two-way traders than in non-traders; Female salaries are 77 per cent of men's salary in two-way traders, while it is 83 per cent in non-traders.

Thus, while trade participation may increase the gender pay gap, both sexes may receive a salary boost, although one that is not distributed equally. The share of women employed by two-way traders is also lower than the share of men. In non-traders, women workers make up 39 per cent of the workforce, compared to 30 per cent in two-way traders.

Reading the section on STEM of table 5, employees with STEM education command a sizeable premium from trade participation, as women with a STEM degree receive 33 per cent higher salaries in two-way traders, and men 43 per cent higher salaries compared with non-traders. Again, STEM educated workforce have lower women's to men's salary ratio in two-way traders than in non-traders (by 7 percentage points). It is noticeable that the share of women in STEM educated employment is very low, although it is higher in two-way traders (13 %) than for non-traders (7%).

The section on DDC of table 5 shows that the DDC educated workforce receive quite an equal pay also when broken down by trade status of the enterprise. In two-way traders, DDC educated women's salaries are 90 per cent of men's salaries, and in non-traders 95 per cent. However, only around 5 per cent of the DDC educated employees are women. Compared to those with STEM education, DDC educated women earn salaries about 15 per cent higher in two-way traders, whereas for men there is no notable difference.

Women managers (ISCO-1 section of table 5) receive 86 per cent more salary in two-way traders than women managers in non-trader enterprises, while for male managers the salary increase is 76 per cent. This means that women managers receive more equal pay in trading enterprises than in non-traders. Women's salary is 87 per cent of men's salary in this category, while it is 81 per cent in non-traders. However, only 19 per cent of managers are women in two-way trader enterprises, and 24 per cent in non-traders. In exporter firms women managers earn 90 per cent of the corresponding salary for men, but make up only 16 per cent of managers (column 1).

Female professionals (ISCO-2 section of table 5) earn more equal pay than women in most other professional sectors - 86 to 88 per cent of male professional's salary across all trade status categories (columns 1-4). This observation resembles the one noted for DDC educated workers. The gender pay gap is about the same in trader and non-trader businesses, although it is slightly smaller in two-way traders. The share of women employed as professionals is somewhat higher than for managers, at 26 per cent in two-way traders and 33 per cent in non-traders.

As we have seen, women form the majority in the support and sales functions in the business sector. The sections on ISCO-4 and ISCO-5 of table 5 shows that two-way traders are not an exception, as women make up 66 per cent of the ISCO-4 category, i.e. clerical support workers and the same is observed for ISCO-5, i.e. service and sales workers as shown. In terms of pay, women's salary is 85 and 78 per cent of men's salary in ISCO-4 and ISCO-5, respectively. Two-way traders pay more than non-traders to both women and men. Based on these statistics, women are paid around 20 per cent more in clerical jobs and as much as 38 per cent more in service and sales jobs in two-way traders when compared to non-traders.

In summary, the highest paying occupations are usually occupied by men and this trend is exacerbated by trade participation, the conclusions on pay gap are mixed. High skills professions for instance, have smaller pay gaps in two-way traders than in non-traders. Although looking at the total employment, two-way traders have larger pay gaps than non-traders, which is stems from the distribution of high paying jobs within firms.

5. Robustness and statistical inference

This section reviews the robustness of our conclusions when confronted with alternative definitions and classic statistical inference.

Since the pay gap assessment using average pay might be sensitive to extreme values, we also compute the pay ratios using median wages and salaries by occupation and industry. While using medians instead of averages makes the salary differences appear smaller, it does not alter the main conclusions. In fact, the smaller median pay gap confirms the tendency of men being overrepresented in the few highest paying jobs that are factored into the average pay gap calculations. Summary of this sensitivity check is presented in table 6. In particular for occupations requiring higher skill levels, the salary ratios in independent firms as compared to MNEs differ by 4 percentage points when salaries are measured by medians, and by 5 percentage points, if averages are used to measure salaries.

Table 7 presents t-test results by job category to determine whether the difference in means is 0. This type of evidence is useful to verify that the measured differences are large enough to allow statistical inference and to make more meaningful conclusions. In table 7, for analytical tractability reasons, non-MNEs (independent and domestic groups) are grouped together and compared to MNEs (domestically owned and foreign owned). The means are statistically speaking different for almost all job categories with 99 per cent confidence. The exceptions are ISCO-7 category (with 95% confidence), DDC and ISCO-6 categories for which the differences are not statistically significant. As earlier noted, DDC employees enjoy the most equal pay regardless of enterprise type, and this finding provides further evidence of that. Moreover, it is interesting to notice that, when grouping data in this way to non-MNEs and MNEs, the pay differences are in favour of women in clerical service professions and in service and sales occupations (ISCO-4 and ISCO-5) of non-MNEs.

Multivariate regression analyses were performed at a firm-level to confirm statistical significance of the differences in women's and men's pay between independent and domestic groups and multinational enterprises broken down by country of origin of the enterprise.

In particular, we estimate the following regression:

$$y_{i,t} = \alpha_i + \beta T_{i,t} + X_{i,t}\gamma + \mu_t + \varepsilon_{i,t} \tag{1}$$

In (1), $y_{i,t}$ represent women's / men's salaries in firm i, in year t. $T_{i,t}$ represents a set of indicator variables (*treatments*) for each of the enterprise relationship groupings of interest (independent, domestic group, domestically owned MNE, Nordic, EU26, Asian, Latin American or African, North American MNEs) and it is 1 if firm belongs to the group of interest, and 0 otherwise. Therefore, interpreting β allows to infer the effect on the salary ratio by the different firm types.

$X_{i,t}$ is a set of firm controls, which include 2-digit NACE indicators, number of employees, labour productivity, trade openness (exports+imports)/(turnover+purchases), and indicators for each trade participation category (exporter, importer, and two-way trader). μ_t term includes indicators for each year in the panel (excluding 2008), thus controlling for possible business cycle effects. $\varepsilon_{i,t}$ represent the errors clustered around firm id.

Table 8 provides the resulting coefficients. The independent category is excluded, and coefficients β represent the relative differences to independent firms. (1) is estimated separately for each job category. The results show corroborating evidence in support of our observations in section 4.2. The coefficients in STEM and ISCO-1 columns indicate that Latin-American enterprises have the largest gender pay gaps

among multinationals in these professions. Chinese MNEs appear to have the largest gender pay gaps in the job categories from ISCO-2 to ISCO-5. Altogether, the results in table 8 establish that the differences between the independent category and the rest of the enterprise types are statistically significant across job categories in terms of pay inequality when observable firm characteristics are controlled for.

As a final robustness check, we verify that the decision to exclude part-time workers (14 per cent of workers) from the sample leads to smaller gender pay gap estimates. For example, the percentage of women's salaries of men's salaries computed including part-time workers would be 81 per cent in independent enterprises (it is 82% if part-time workers are excluded) and 68 per cent in foreign owned multinationals (it is 71% if part-time workers are excluded). If one person companies are included in the computations, the percentage would be 81 in independent enterprises. As mentioned before, these choices were driven by data quality considerations, and because in this way, the analysis focuses on roughly comparable labour participation of women and men.

6.   Conclusions and recommendations

This paper presents a set of novel indicators that have the potential to further the debate revolving around the benefits of multinational enterprises and their multifaceted role in societies, and in addition, on the role that foreign trade participation has on wealth creation and its distributive effects. The analysis focuses on gender equality in different types of firms, measured by the participation of women and men in the business sector in different capacities and jobs, and by the difference in women's and men's pay.

Using high-quality Finnish registers, covering in principle the entire business sector and linking employees to employers, we find significant differences in the share of women and men employed in the best paying professions, such as in managerial jobs, and in professions requiring a science, technology, engineering or mathematics degrees, or deep digital competencies. In multinationals and foreign traders, women are much less likely to occupy these professions, indicating that economic globalization tends to strengthen gendered labour market outcomes in Finland. However, while the statistics evidence a sizeable gender pay gap in the business sector, it is smaller in domestically owned businesses.

While the share of women in highly qualified professions working in enterprises engaged in foreign trade is lower, women in these professions experience lower gender pay gaps compared with businesses that are not involved in foreign trade. For highly qualified professionals, the gender pay gap is noticeably larger in foreign and domestic MNEs firms operating in knowledge intensive services. These firms also pay high salaries.

Some interesting variations are evident when pay gaps by country of origin of multinational enterprises are analysed. Notably, Latin American, African and Chinese owned MNEs provide the most unequal pay between women and men in high-paying professions. This may arise from cultural differences. This points to an interesting avenue for further research. Vahter & Masso (2018) is an interesting case going in this direction.

As the analytical framework in this paper builds on existing capacity and makes use of available statistical data that are also widely accessible to other national statistical offices and Eurostat (Eurostat, 2019), this work can lead to improved analysis and data on multinational enterprises, foreign trade, and gender based outcomes in the labour market in order to support policy-making in the efforts of reaching the Addis Ababa Action Agenda and the 2030 Agenda for Sustainable Development.

Based on these statistics, it will be important to explore ways to encourage women's entry to the highly productive employment in multinational enterprises, the possible causes of existing pay gaps and lack of participation of women. For example, the mechanisms assessed in Bøler et al. (2018) and in Vahter &

Masso (2018) are promising in the sense of providing an actionable policy target. By reducing the (perceived or otherwise) discrepancies in time-use and producing statistics that shed light on gender equality issues, countries can strive for a smaller gender pay gap. Targeted efforts may be needed to support the corporate social responsibility of multinationals and businesses engaged in foreign trade. On the other hand, policy programmes aimed at enhancing job creation possibilities of independent small and medium enterprises would promote gender equality too.

Future research should concentrate on establishing causal relationships between gender and (self) selection into the most lucrative professions, and salaries, in multinational and trader firms. It is an interesting question, for example, how the business cultures differ among MNEs and how that affects the gender pay gap. Important future effort should also focus on providing similar data and statistics on a regular basis from the data sets held by statistical offices. In that vein, the European Commission is undertaking work with UNCTAD to advance the development and use of data and statistics for gender-responsive trade policy.

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7. Tables and figures

Table 1. The Finnish business sector by firm type, 2008-2016, average

	(1)	(2)
Firm type	**Observations**	**Per cent**
Multinational enterprises		
MNEs	22870	4 %
Others	521667	96 %
Trading status		
Exports only	14684	3 %
Imports only	86039	16 %
Two-way traders	32834	6 %
Non traders	410980	75 %
Size distribution		
Large (>250 FTE)	4864	1 %
Medium (50-250 FTE)	19785	4 %
Small (10-50 FTE)	109397	20 %
Micro (<10 FTE)	410491	75 %
Activity distribution		
Manufacturing	85622	16 %
Construction	88836	16 %
Trade	131727	24 %
Services	238352	44 %

Note: Observations refer to firm-years over 2008-2016.

Table 2. An overview of the business sector by enterprise relation, 2008-2016, average

	(1)	(2)	(3)	(4)
Size, productivity and salaries	Size by employees	Labour productivity	Female salary	Male salary
Independent	8	60188	25732	31219
Domestic group	67	93269	33275	43365
Domestic MNE	**234**	96071	**41526**	**59079**
Foreign MNE	89	**115130**	41499	58292
Nace category	Manufacturing	Construction	Trade	Services
Independent	14 %	**18 %**	24 %	**44 %**
Domestic group	28 %	9 %	19 %	45 %
Domestic MNE	**45 %**	4 %	19 %	31 %
Foreign MNE	21 %	3 %	**42 %**	34 %
Trading status	Exports	Imports	Two-way trader	Non-trader
Independent	2 %	15 %	4 %	**79 %**
Domestic group	5 %	17 %	14 %	64 %
Domestic MNE	**8 %**	15 %	**45 %**	32 %
Foreign MNE	5 %	**39 %**	32 %	24 %
Skills	% of professionals	% STEM	% DDC	
Independent	11 %	33 %	7 %	
Domestic group	14 %	34 %	9 %	
Domestic MNE	18 %	34 %	8 %	
Foreign MNE	**20 %**	**39 %**	**12 %**	
Gender differences	Female participation rate	Premia	Women/Male salary	
Independent	33 %	-2.7 %	**82 %**	
Domestic group	**39 %**	1.5 %	77 %	
Domestic MNE	37 %	1.4 %	70 %	
Foreign MNE	36 %	**0.0 %**	71 %	
Average	36 %			

Note: Premia are computed as deviation from the business sector participation rate, % of professionals refers to ISCO-2 category of workers. Percentages under the NACE category and Trading status sections are computed from the number of firms, while percentages in Skills and Gender differences sections are computed from workers. Labour productivity is measured as nominal value added at factor cost divided by persons employed. The largest values of each column are shown in bold.

Figure 1: Women's salary as a percentage of men's salary in manufacturing by enterprise relation, total workforce, 2008-2016, average
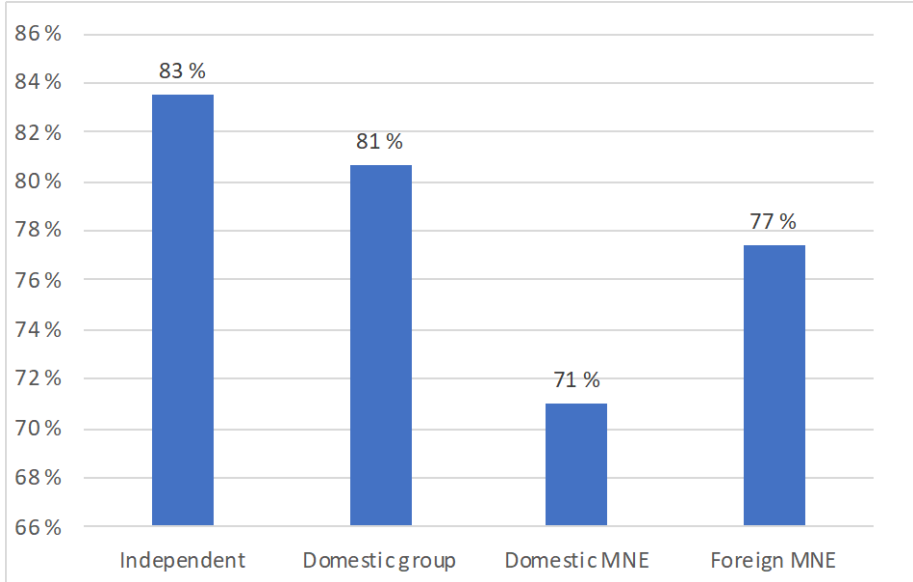
Figure 2: Women's salary as a percentage of men's salary in KIS by enterprise relation, total workforce, 2008-2016, average
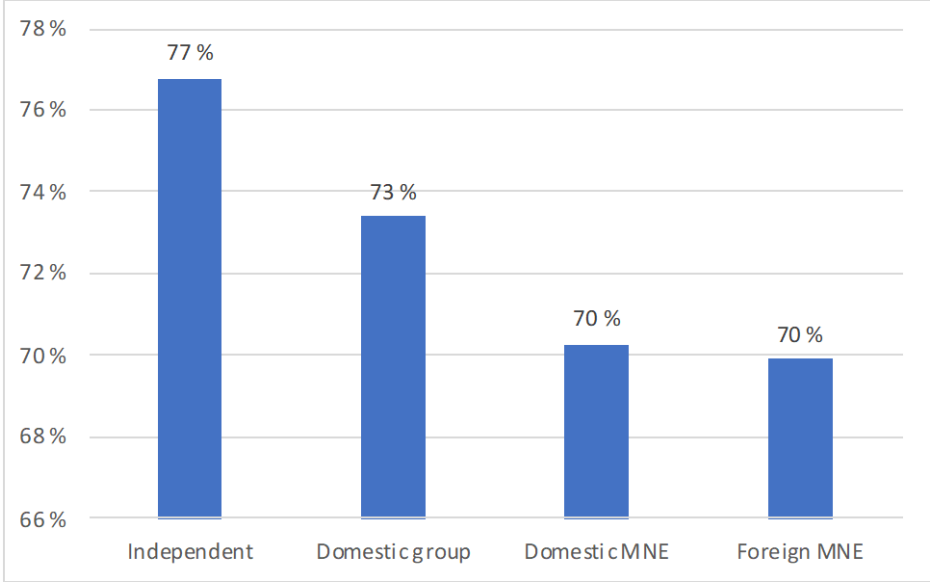
Table 3. Pay and participation rates of women by enterprise relation, industry and job category, 2008-2016, average

| Enterprise relation	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Independent			Domestic group			Domestic MNE			Foreign MNE		
	Manufacturing	KIS	Other activities	Manufacturing	KIS	Other activities	Manufacturing	KIS	Other activities	Manufacturing	KIS	Other activities
TOTAL												
Labour productivity	58122	66735	59300	74593	71837	105806	93021	**51921**	121377	90096	107083	**125255**
Women's salary	26237	31288	**24328**	32679	38273	32138	40395	44542	41401	39040	**44839**	41428
Men's salary	31438	40753	**29386**	40528	52148	42208	50936	63386	59493	50406	**64145**	59229
Women's/Men's salary	**83.5 %**	76.8 %	82.8 %	80.6 %	73.4 %	76.1 %	70.9 %	70.3 %	70 %	77.4 %	69.9 %	**69.9 %**
% of female	**24 %**	39 %	35 %	26 %	37 %	45 %	31 %	35 %	**44.8 %**	25 %	32 %	44 %
STEM												
Women's salary	26439	36050	**24568**	32890	41351	32264	45313	47356	44439	39554	**51167**	42137
Men's salary	32441	44211	**30894**	40773	55036	42802	61826	70811	67461	53554	**73721**	61158
Women's/Men's salary	81.5%	**81.5%**	79.5%	80.7%	75.1%	75.4%	73.3%	66.9%	**66 %**	73.9%	69.4%	68.9%
% of female	10 %	19 %	8 %	11 %	18 %	12 %	16 %	**19 %**	14 %	11 %	17 %	12 %
DDC												
Women's salary	31470	42381	**27233**	35736	44356	35144	41960	53192	50760	44024	**58147**	42657
Men's salary	34033	46114	**32846**	40017	54156	42682	53806	64643	56308	50155	**75921**	57309
Women's/Men's salary	90.9%	**91.9%**	82.9%	89.3%	81.9%	82.3%	78.0%	82.3%	90 %	87.8%	76.6%	**74.4%**
% of female	4 %	8 %	**2 %**	5 %	10 %	4 %	7 %	8 %	6.4 %	6 %	**10 %**	4 %
ISCO-1												
Women's salary	42489	54172	**34366**	73613	74894	70151	**104909**	96149	94159	86094	96643	87842
Men's salary	52019	63230	**44387**	86159	87906	80652	131408	120472	**135350**	109291	121552	113107
Women's/Men's salary	81.7%	**85.7%**	77.4%	85.4%	85.2%	81.0%	79.8%	76.0%	**70 %**	78.8%	79.5%	77.7%
% of female	16 %	21 %	24 %	**15 %**	23 %	25 %	22 %	25 %	**25.4%**	17 %	22 %	24 %
ISCO-2												
Women's salary	37175	36832	**35807**	44965	43405	43057	51810	48129	52490	51906	51958	**53834**
Men's salary	42571	43670	**40205**	51548	53107	51529	61770	65530	62100	60820	**67560**	64257
Women's/Men's salary	87.3%	84.3%	**89.1%**	87.2%	81.7%	83.6%	83.9%	**73.4%**	85 %	85.3%	76.9%	83.8%
% of female	**20 %**	29 %	39 %	21 %	30 %	38 %	32 %	28 %	**43.0%**	23 %	28 %	38 %
ISCO-3												
Women's salary	31532	**29891**	30352	35729	35248	35911	38480	38795	40282	38674	40883	**43643**
Men's salary	37412	**35144**	36786	43387	43039	46513	47417	45961	53938	49294	53187	**58455**
Women's/Men's salary	84.3%	**85.1%**	82.5%	82.3%	81.9%	77.2%	81.2%	84.4%	75 %	78.5%	76.9%	**74.7%**
% of female	**32 %**	55 %	43 %	34 %	42 %	40 %	42 %	41 %	43.7%	33 %	33 %	39 %
ISCO-4												
Women's salary	27808	**25152**	26530	30941	29655	29882	32938	32196	33360	33609	32644	**34281**
Men's salary	32251	**26510**	30605	36232	32465	34966	40655	33364	**40792**	39993	38701	40165
Women's/Men's salary	86.2%	**94.9%**	86.7%	85.4%	91.3%	85.5%	**81.0%**	96.5%	82 %	84.0%	84.3%	85.3%
% of female	80 %	71 %	71 %	77 %	**81 %**	60 %	74 %	76 %	**57 %**	75 %	77 %	70 %
ISCO-5												
Women's salary	22126	20831	**20502**	27971	25309	25628	28373	25564	**30857**	30577	26328	30835
Men's salary	29786	26073	**25096**	35393	29195	32630	37529	33173	40041	38409	33227	**41737**
Women's/Men's salary	74.3%	79.9%	81.7%	79.0%	**86.7%**	78.5%	75.6%	77.1%	77 %	79.6%	79.2%	**73.9%**
% of female	68 %	60 %	61 %	66 %	69 %	72 %	64 %	**73 %**	64.9%	**51 %**	66 %	60 %
ISCO-6												
Women's salary	17644	22537	18278	22524	**30928**	18516	24164	**10165**	23448	20305	17006	20128
Men's salary	22642	21500	23627	26562	27905	25548	**35711**	19971	26660	32708	22325	24072
Women's/Men's salary	77.9%	104.8%	77.4%	84.8%	**110.8%**	72.5%	67.7%	**50.9%**	88 %	62.1%	76.2%	83.6%
% of female	26 %	58 %	50 %	43 %	36 %	46 %	**9 %**	25 %	40 %	16 %	**71 %**	61 %
ISCO-7												
Women's salary	23244	25248	**22534**	27374	31013	26521	28440	30335	29445	30047	**31589**	30089
Men's salary	**28830**	29892	28850	33648	36290	34273	35162	37577	36908	36688	38205	**38587**
Women's/Men's salary	80.6%	84.5%	78.1%	81.4%	**85.5%**	77.4%	80.9%	80.7%	80 %	81.9%	82.7%	78.0%
% of female	11 %	10 %	5 %	12 %	10 %	5 %	11 %	**21 %**	6.7%	10 %	14 %	**5 %**
ISCO-8												
Women's salary	22456	**21405**	21964	27401	26767	27177	29007	31507	30512	**31186**	29983	29447
Men's salary	27583	27616	**27172**	32405	30253	33920	34196	30432	35794	**37222**	32784	36103
Women's/Men's salary	81.4%	**77.5%**	80.8%	84.6%	88.5%	80.1%	84.8%	**103.5%**	85 %	83.8%	91.5%	81.6%
% of female	29 %	25 %	7 %	31 %	40 %	8 %	26 %	**55 %**	5.0%	26 %	47 %	9 %
ISCO-9												
Women's salary	19241	**15790**	17558	24911	19416	20938	26629	17849	24430	**28194**	17983	23155
Men's salary	25635	22297	24120	30294	24888	27804	31760	**21876**	30051	**33541**	26755	30155
Women's/Men's salary	75.1%	70.8%	72.8%	82.2%	78.0%	75.3%	83.8%	81.6%	81 %	**84.1%**	67.2%	76.8%
% of female	38 %	46 %	45 %	33 %	36 %	43 %	31 %	48 %	51 %	**24 %**	38 %	**51 %**

Note: KIS=Knowledge Intensive Services

The ISCO categories include: 1 Managers, 2 Professionals, 3 Technicians and associate professionals, 4 Clerical support workers, 5 Service and sales workers, 6 Skilled agricultural, forestry and fishery workers, 7 Craft and related trades workers, 8 Plant and machine operators, and assemblers, 9 Elementary occupations. Labour productivity is measured as nominal value added at factor cost divided by persons employed. The smallest and largest values of each row are in bold.

Figure 3: Women's salary as a percentage of men's salary by country of ownership of the enterprise, total workforce, 2008-2016 average
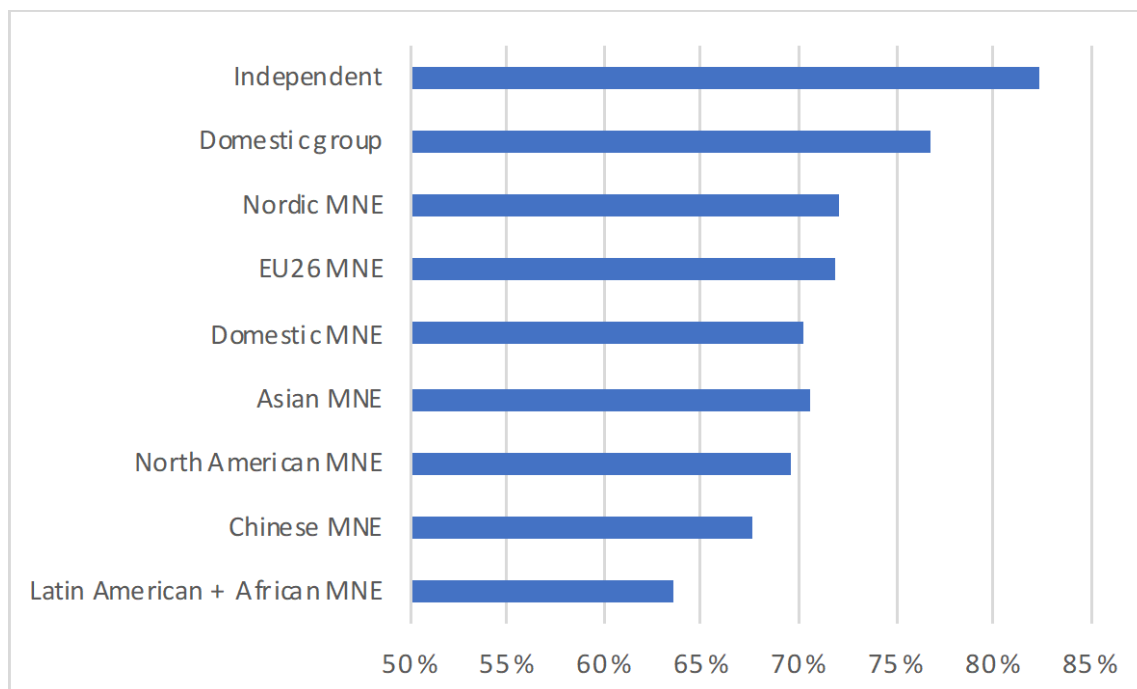
Table 4. Women's salary as a percentage of men's salary by country of ownership of the enterprise, 2008-2016, average

Women's salary / men's salary	(1) Independent	(2) Domestic group	(3) Domestic MNE	(4) Nordic MNE	(5) EU26 MNE	(6) Asian MNE	(7) Latin American + African MNE	(8) Chinese MNE	(9) North American MNE
TOTAL	82 %	77 %	70 %	72 %	72 %	71 %	63 %	68 %	70 %
STEM	83 %	77 %	69 %	70 %	70 %	74 %	56 %	54 %	69 %
DDC	93 %	86 %	83 %	74 %	83 %	93 %	80 %	69 %	76 %
ISCO-1	79 %	83 %	75 %	78 %	79 %	82 %	76 %	117 %	74 %
ISCO-2	86 %	84 %	82 %	84 %	85 %	79 %	86 %	68 %	78 %
ISCO-3	83 %	79 %	79 %	77 %	76 %	75 %	76 %	75 %	73 %
ISCO-4	89 %	86 %	83 %	85 %	85 %	86 %	120 %	49 %	87 %
ISCO-5	81 %	79 %	76 %	75 %	74 %	76 %	NA	67 %	77 %
ISCO-6	79 %	77 %	75 %	83 %	68 %	NA	NA	NA	NA
ISCO-7	79 %	79 %	80 %	78 %	82 %	84 %	88 %	83 %	79 %
ISCO-8	81 %	83 %	85 %	84 %	84 %	83 %	74 %	79 %	84 %
ISCO-9	73 %	77 %	82 %	79 %	79 %	83 %	NA	93 %	83 %

Note: We discard unknowns in the ultimate controlling institutional unit from these calculations. The Nordic countries include Sweden, Denmark and Norway. The EU26 includes EU28 countries and Switzerland, but excludes the Nordic countries (Finland, Sweden, Norway and Denmark). The smallest and largest values of each row are in bold.

The ISCO categories include: 1 Managers, 2 Professionals, 3 Technicians and associate professionals, 4 Clerical support workers, 5 Service and sales workers, 6 Skilled agricultural, forestry and fishery workers, 7 Craft and related trades workers, 8 Plant and machine operators, and assemblers, 9 Elementary occupations. The smallest and largest values of each row are in bold.

Figure 4: Women's salary as a percentage of men's salary in selected educational or occupational groupings, by two-way traders and non-traders, 2008-2018 average
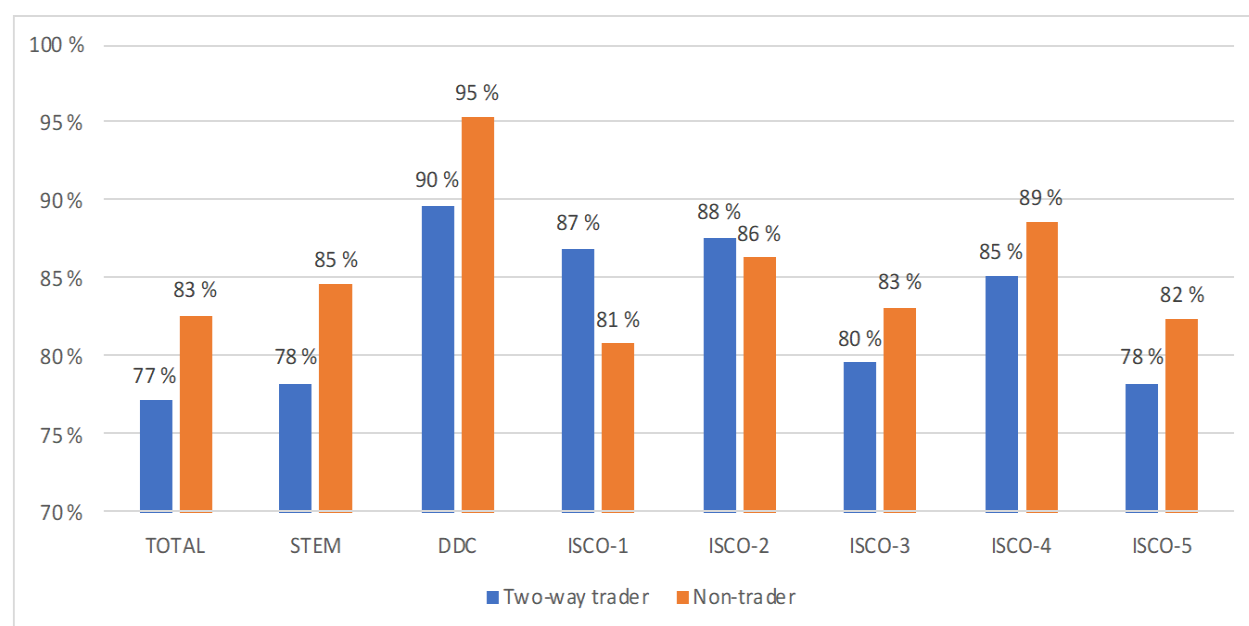
Table 5. Pay and participation rates of women by trading status, 2008-2016, average

	(1) Exports only	(2) Imports only	(3) Two-way trader	(4) Non-trader
TOTAL				
Labour productivity	68842	69255	**80516**	62830
Women's salary	32838	29318	**35078**	25931
Men's salary	40588	37407	**45416**	31370
Women's/Men's salary	81 %	78 %	**77 %**	**83 %**
% of female	**25 %**	38 %	30 %	**39 %**
STEM				
Women's salary	35306	31080	**37099**	27881
Men's salary	41115	39146	**47392**	32944
Women's/Men's salary	**86 %**	79 %	**78 %**	85 %
% of female	**8 %**	**13 %**	**13 %**	10 %
DDC				
Women's salary	41242	39474	**42825**	33862
Men's salary	44131	41736	**47763**	35515
Women's/Men's salary	93 %	95 %	**90 %**	95 %
% of female	4 %	5 %	**6 %**	4 %
ISCO-1				
Women's salary	64648	58061	**77161**	41481
Men's salary	71506	68355	**88744**	51329
Women's/Men's salary	**90 %**	85 %	87 %	**81 %**
% of female	**16 %**	21 %	19 %	**24 %**
ISCO-2				
Women's salary	42798	42850	**46951**	37849
Men's salary	49497	48942	**53558**	43841
Women's/Men's salary	86 %	88 %	88 %	86 %
% of female	27 %	33 %	**26 %**	33 %
ISCO-3				
Women's salary	34989	34460	**37326**	30965
Men's salary	42670	42606	**46877**	37234
Women's/Men's salary	82 %	81 %	**80 %**	**83 %**
% of female	**36 %**	37 %	**36 %**	**46 %**
ISCO-4				
Women's salary	29430	29598	**31837**	26597
Men's salary	34899	34660	**37414**	30019
Women's/Men's salary	**84 %**	85 %	85 %	**89 %**
% of female	**55 %**	**71 %**	66 %	67 %
ISCO-5				
Women's salary	26861	22824	**28479**	20680
Men's salary	33829	30183	**36358**	25116
Women's/Men's salary	79 %	**76 %**	78 %	**82 %**
% of female	**53 %**	63 %	**66 %**	65 %
ISCO-6				
Women's salary	20461	20650	**21178**	18116
Men's salary	25221	26379	**27570**	23181
Women's/Men's salary	**81 %**	78 %	**77 %**	78 %
% of female	29 %	**52 %**	**24 %**	47 %
ISCO-7				
Women's salary	25312	24490	**27323**	23230
Men's salary	30710	31092	**33555**	29047
Women's/Men's salary	**82 %**	**79 %**	81 %	80 %
% of female	7 %	10 %	**10 %**	7 %
ISCO-8				
Women's salary	24961	24419	**27544**	22239
Men's salary	30246	29613	**32466**	27406
Women's/Men's salary	83 %	82 %	**85 %**	**81 %**
% of female	16 %	22 %	**28 %**	**11 %**
ISCO-9				
Women's salary	21361	20255	**25130**	17705
Men's salary	28696	27071	**30103**	24123
Women's/Men's salary	74 %	75 %	**83 %**	**73 %**
% of female	**26 %**	35 %	29 %	**52 %**

Note: KIS=Knowledge Intensive Services

The ISCO categories include: 1 Managers, 2 Professionals, 3 Technicians and associate professionals, 4 Clerical support workers, 5 Service and sales workers, 6 Skilled agricultural, forestry and fishery workers, 7 Craft and related trades workers, 8 Plant and machine operators, and assemblers, 9 Elementary occupations. Labour productivity is measured as nominal value added at factor cost divided by persons employed. The smallest and largest values of each row are shown in bold.

Table 6. Median vs. average salaries and pay differential, by occupation, industry and enterprise relation.

	All		Higher skills	
	Median	Average	Median	Average
Independent	82 %	82 %	85 %	84 %
Domestic group	84 %	83 %	84 %	83 %
Domestic MNE	82 %	80 %	81 %	79 %
Foreign MNE	81 %	80 %	81 %	79 %

Note: **All** denotes unweighted average pay gap computed separately for each 1-digit occupational groups and industry groupings. **Higher skills occupations** are unweighted average of ISCO-1, ISCO-2, and ISCO-3 computed for each 1-digit occupational group and industry groupings.

Table 7. Two-sample t-test with equal variances

	N	Mean	Std. Err.	N	Mean	Std. Err.
		STEM			**DDC**	
Non-MNE	51,985	89 %	0.002	7,861	86 %	0.004
MNE	9,095	81 %	0.004	3,244	86 %	0.006
Difference		8 %			-1 %	
t-value	13.6***			-0.73		
		ISCO-1			**ISCO-2**	
Non-MNE	34,044	95 %	0.004	43,002	92 %	0.002
MNE	7,681	82 %	0.006	10,935	88 %	0.003
Difference		13 %			4 %	
t-value	15.5***			7.8***		
		ISCO-3			**ISCO-4**	
Non-MNE	58,195	98 %	0.003	20,395	115 %	0.008
MNE	12,468	82 %	0.003	6,094	94 %	0.008
Difference		16 %			20 %	
t-value	23.63***			13.02***		
		ISCO-5			**ISCO-6**	
		122				
Non-MNE	59,817	%	0.007	510	107 %	0.044
MNE	3,203	99 %	0.022	38	102 %	0.217
Difference		23 %			5 %	
t-value	7.31***			0.28		
		ISCO-7			**ISCO-8**	
Non-MNE	30,953	88 %	0.003	31,718	99 %	0.005
MNE	2,800	85 %	0.006	3,776	88 %	0.006
Difference		2 %			12 %	
t-value	2.27**			7.81***		
		ISCO-9				
		106				
Non-MNE	18,680	%	0.007			
MNE	3,128	89 %	0.009			
Difference		17 %				
t-value	9.41***					

Note: Salaries are winsorized at 99% and 1% of the distribution of each occupational grouping.

The ISCO categories include: 1 Managers, 2 Professionals, 3 Technicians and associate professionals, 4 Clerical support workers, 5 Service and sales workers, 6 Skilled agricultural, forestry and fishery workers, 7 Craft and related trades workers, 8 Plant and machine operators, and assemblers, 9 Elementary occupations

Table 8. MNEs and salary differences between women and men in occupations, regression coefficients

	women's/men's salary										
	STEM	DDC	ISCO-1	ISCO-2	ISCO-3	ISCO-4	ISCO-5	ISCO-6	ISCO-7	ISCO-8	ISCO-9
Domestic group	-0.07	**-0.06**	**-0.11**	-0.06	-0.13	**-0.15**	-0.20	-0.04	**-0.05**	-0.09	-0.12
	(-8.95)***	(-3.38)***	(-9.66)***	(-9.62)***	(-18.71)***	(-7.35)***	(-8.54)	(-0.34)	(-6.89)***	(-7.4)***	(-7.11)***
Domestic MNE	-0.08	-0.04	-0.15	-0.05	**-0.11**	-0.18	**-0.13**	-0.02	-0.03	-0.10	-0.12
	(-4.05)***	(-1.51)	(-7.77)***	(-4.71)***	(-9.83)***	(-6.85)***	(-2.18)**	(-0.08)	(-1.28)	(-4.27)***	(-4.48)***
Nordic MNE	-0.09	-0.08	-0.13	-0.05	-0.16	-0.14	-0.16	0.39	-0.06	-0.10	-0.11
	(-6.18)***	(-3.26)***	(-7.37)***	(-4.3)**	(-14.72)***	(-4.86)***	(-2.23)**	(1.27)	(-3.39)***	(-6.02)***	(-3.82)***
EU26 MNE	-0.09	-0.01	-0.13	**-0.04**	-0.15	-0.15	-0.26	0.45	-0.01	-0.08	-0.11
	(-6.88)***	(-0.42)	(-7.48)***	(-3.41)***	(-13.88)***	(-5.39)***	(-4.03)***	(0.42)	(-0.59)	(-4.76)***	(-4.17)***
Asian MNE	-0.07	0.00	-0.13	-0.06	-0.16	-0.18	-0.25		-0.03	**-0.08**	-0.15
	(-2.26)**	(-0.06)	(-4.46)***	(-3.29)***	(-8.32)***	(-4.52)***	(-2.69)		(-1.22)	(-1.65)	(-2.9)***
Latin American + African MNE	**-0.18**	**-0.11**	**-0.17**	0.04	-0.15	1.13			0.01	-0.07	
	(-2.16)**	(-2.48)***	(-2.65)***	(0.72)	(-2.95)***	(1.38)			(0.17)	(-1.84)*	
Chinese MNE	-0.12	-0.05	-0.07	**-0.16**	**-0.20**	**-0.38**	**-0.37**		-0.01	-0.09	**-0.06**
	(-2.59)***	(-0.81)	(-0.67)	(-2.87)***	(-4.26)***	(-3.59)***	(-3.39)***		(-0.25)	(-0.74)	(-0.77)
North American MNE	**-0.05**	-0.04	-0.13	-0.07	-0.16	-0.15	-0.20		**-0.06**	**-0.12**	-0.11
	(-2.78)**	(-1.31)	(-5.98)***	(-4.72)***	(-12.4)***	(-3.59)***	(-2.69)***		(-2.88)***	(-4.25)***	(-3.33)***
Obs	60,886	11,089	41,621	53,788	70,434	26,390	62,673	543	33,682	35,456	21,712
R-squared	0.023	0.045	0.021	0.017	0.038	0.066	0.008	0.258	0.015	0.013	0.035
Clusters	14,580	2,653	13,094	13,834	19,121	8,110	17,695	234	10,838	10,425	7,409

Note: β coefficients from (1). The regressions include full specifications as explained in (1) and the error terms are clustered around firm id. The coefficients are interpreted as differences from the independent category. The negative coefficient values indicate smaller salaries for women with respect to men. Clusters refer to the number of firms in the regression. The smallest and largest values of each column are shown in bold. The t-statistics are presented in brackets.

The ISCO categories include: 1 Managers, 2 Professionals, 3 Technicians and associate professionals, 4 Clerical support workers, 5 Service and sales workers, 6 Skilled agricultural, forestry and fishery workers, 7 Craft and related trades workers, 8 Plant and machine operators, and assemblers, 9 Elementary occupations

***, ** and * denotes significance at 1%, 5% and 10% level, respectively.