GENDER BIAS IN BUSINESS ENGINEERING PROFESSIONS

Suzana Carmen CISMAS*

***Abstract*:** *Gender inequality and discrimination cause and perpetuate poverty and vulnerability in the contemporary society as a whole. Studies on gender in business, science and technology have produced conflicting results. Inequities stem from social structures having institutional conceptions of gender differences, and resulting in structural marginalization. Traditional concepts of gender stereotypes are challenged nowadays and improvement can be observed. Gender parity is measured in education, as proportion in employment and in national legislatures. Addressing gender bias via social protection programs designed to increase equity is a way of mitigating the negative effects. For generations, the corporate world has largely adopted a male definition of achievement and success. Women can be just as ambitious and career driven as men, but they have a different perspective on life. To succeed in developing a more diverse and gender-balanced work-force, corporate leaders must instill commitment and accountability; they have to do what they believe is right not just improve organization performance.*

Keywords *– gender bias, business engineering professions, income disparities, job segregation.*

Definition

Gender inequality is the idea and situation that women and men are not equal, and refers to unfair treatment wholly or partly due to their gender. It stems from differences in gender roles. Gender systems are often dichotomous and hierarchical. Gender inequality originates in distinctions whether empirically grounded or socially constructed. Women seem to lag behind men in many domains, including education, labor market opportunities and political representation. Traditionally, women are viewed as caring or nurturing, so they are destined for occupations which require these skills. Such skills are culturally valued and typically associated with domesticity, so jobs requiring these skills are not valued economically. Men have traditionally been viewed as the main worker in the home, so jobs held by men have been historically valued economically and occupations dominated by men continue to be economically valued and earn higher wages. Gender inequality is a result of the persistent discrimination of one group of people based upon gender and it manifests itself differently according to race, culture, politics, country, and economic situation.

Income disparities caused by the gender pay gap

Income disparities can be linked to job stratification or to the gender pay gap. The gender pay gap is the average difference between men's and women's aggregate salaries. The gap is due to a variety of factors, including differences in education choices, in preferred job and industry, in the types of positions held by men and women, in the type of jobs men typically go into as opposed to women (mainly highly paid and high-risk jobs), as well as differences in amount of work experience, in length of the work week, and breaks in employment. Such factors account for 60% to 75% of the pay gap. Various explanations for the remaining 25% to 40% have been suggested,

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including women's lower willingness and ability to negotiate wages together with gender discrimination.

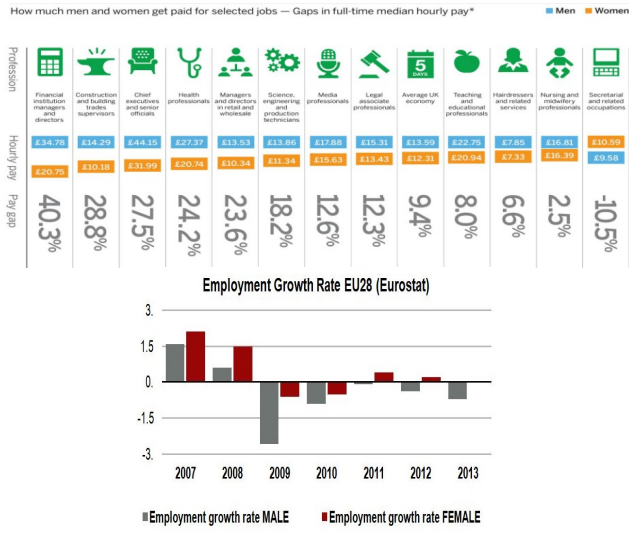

Fig. 1. Gender pay gap, cf. Eurostat and ONS Annual Survey on Hours&Earnings, 2014

According to the European Commission direct discrimination only explains a small part of gender wage differences. In the US, the average female's unadjusted annual salary is about 78% of that of the average male. However, multiple studies by OECD, AAUW, and the US Department of Labor have found that pay rates between males & females varied by 5-6.6%.

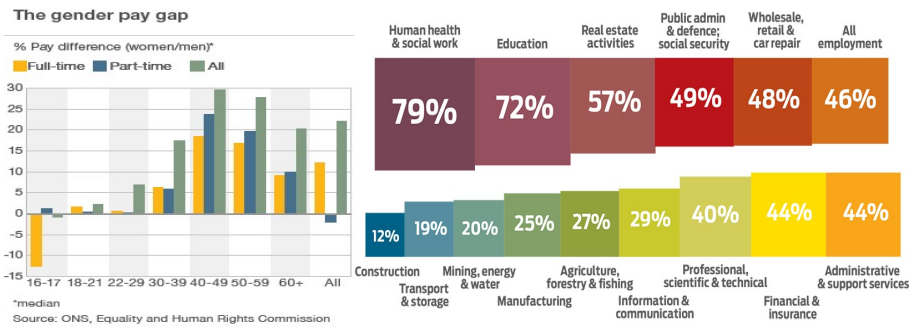

Fig. 2. The gender pay gap and the gender balance in each industry, cf. ONS Equality and Human Rights Commission

Wages are adjusted to different individual choices made by male/female workers in college major, occupation, working hours, and maternal/paternal leave. The remaining 6% gap is thought to originate from deficiency in salary negotiating skills and gender discrimination.

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Occupational gender segregation

Human capital theories refer to the education, knowledge, training, experience, or skill of a person which makes them potentially valuable to an employer. This has historically been understood as a cause of the gendered wage gap but is no longer a predominant cause as women and men in certain jobs tend to have similar education levels and credentials.

Interestingly, even when such characteristics of jobs and workers are controlled for, the presence of women within a certain occupation leads to lower wages. Such discrimination in earnings is considered to be a part of the theory suggesting that jobs with most women offer lower wages than other jobs simply because of the women's presence in the occupation. As women enter an occupation, it reduces the amount of prestige associated with the job and men subsequently leave it. The entering of women into specific occupations suggests that less competent workers have begun to be hired or that the occupation is becoming de-skilled. Men are reluctant to enter female-dominated jobs because of this and similarly resist the entrance of women into male-dominated occupations.

The gendered income disparity is also attributed in part to occupational segregation, where groups of people are distributed across jobs according to ascribed characteristics, in this case, gender. Occupational gender segregation contains two dimensions: horizontal segregation and vertical segregation. In horizontal segregation, occupational gender segregation occurs as men&women are thought to possess different physical, emotional, and mental capabilities. Such different capabilities make the genders vary in the types of jobs they are suited for. This can be specifically viewed with the gendered division between manual and non-manual labor. In vertical segregation, occupational gender segregation occurs as jobs are stratified according to the power, authority, income, and prestige associated with the occupation and women are excluded from holding such jobs.

As women have entered the workforce in larger numbers since the 1960s, occupations have become segregated according to the amount of femininity or masculinity supposed to be associated with each job. Census data suggest that some jobs have become more gender integrated (mail carriers, bartenders, drivers, real estate agents), while occupations including teachers, nurses, secretaries, and librarians have become female-dominated; occupations including architects, electrical engineers, and airplane pilots have remained predominately male in composition.

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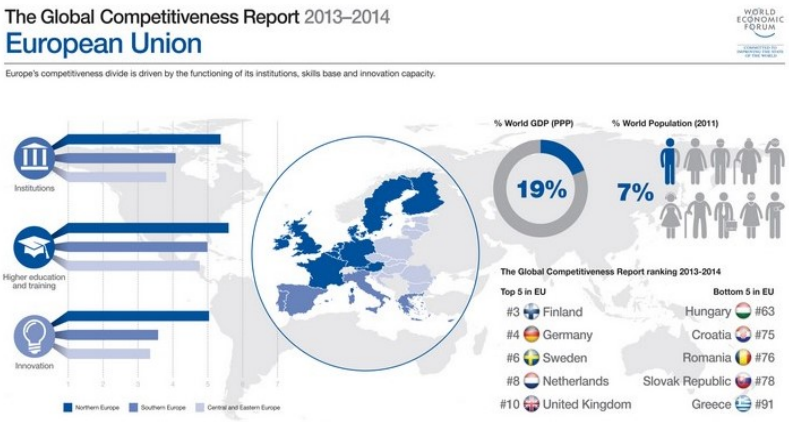

Fig. 3. The global competitiveness report, cf. the World Economic Forum and IMF

According to the census data, women occupy the service sector jobs at higher rates than men. Women's over-representation in services, as opposed to jobs that require managerial work acts as a reinforcement of women and men into traditional gender roles that cause gender inequality. Median weekly earnings of full-time wage and salary workers vary by gender, race, and ethnicity. Scholars disagree on how much of the male-female wage gap depends on factors such as experience, education, occupation, and other job-relevant characteristics. Additional factors such as benefits and overtime explain the raw gender wage gap.

The glass ceiling effect

The glass ceiling effect is also considered a possible contributor to the gender wage gap or income disparity. This effect suggests that gender gives significant disadvantages towards the top of job hierarchies which become worse as a person's career goes on. The term glass ceiling implies that invisible/artificial barriers exist which prevent women from advancing within their jobs or receiving promotions. Such barriers exist in spite of the achievements or qualifications of the women and still exist when other characteristics that are job-relevant such as experience, education, and abilities are assessed. The inequality effects of the glass ceiling are more prevalent within higher-powered or higher income occupations, with fewer women holding such types of jobs.
The glass ceiling effect also indicates the limited chances of women for income raises and promotion or advancement to more prestigious positions or jobs. As women are prevented by these artificial barriers, from either receiving job promotions or income raises, the effects of the inequality of the glass ceiling increase over the course of a woman's career.

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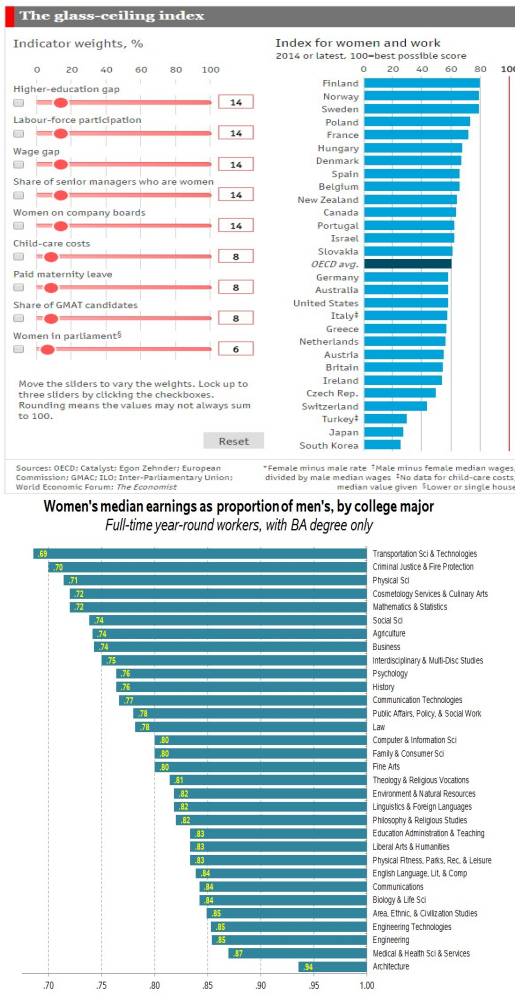

Fig. 4. The glass ceiling index and the women's average earnings as proportional to men's, by college major, cf. OECD and the European Commission statistic data

Statistical discrimination is also a cause of income disparities and gendered inequality at the workplace. Statistical discrimination indicates the likelihood of employers to deny women access to certain occupational tracks because women are more likely than men to leave their job or the labor force when they get married or pregnant. Women are instead given dead-end positions or jobs that have very little mobility.

In third world countries, female entrepreneurs are statistically more prone to failure in business. In the event of a business failure women often return to their domestic lifestyle despite the absence of income. On the other hand, men tend to search for other employment as the household is not a priority.

The gender earnings ratio suggests that there has been an increase in women's earnings comparative to men. Men's plateau in earnings began after the 1970s, allowing for the increase in women's wages to close the ratio between incomes. Despite the smaller ratio

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between men and women's wages, disparity still exists. Census data suggest that women's earnings are 71% of men's earnings in 1999.
The gendered wage gap varies in its width among different races. Whites have the greatest wage gap between the genders: here women earn 78% of the wages that white men do. With African Americans, women earn 90% of the wages that African American men do.
The gender gap also appeared to narrow considerably beginning in the mid-1960s. If 5% of first-year students in professional programs were female in 1965, by 1985 this number had jumped to 40% in law and medicine, and over 30% in dentistry and the business school.

Gender in STEM areas

Research has shown that the effect of gender diversity on team performance depends upon a variety of moderators, such as task difficulty, type of team, the presence and activation of social divisions within the team, and the other types of demographic diversity present in the team. However, the effects of gender diversity should be investigated in light of organizational context. Since differences among team members can lead to certain attitudes and behaviours, contextual factors become paramount for understanding the influence of diversity. In other words, in male-dominated professions, where women are likely to be in the significant minority, initially gender diversity is likely to have more negative effects, given that gender stereotypes are more salient due to the increased categorization of under-represented women. In contrast, in gender-balanced professions, negative stereotyping and categorization by gender are less likely to occur and thus gender diversity should be less problematic.
This point is especially relevant to understanding the role of gender diversity in STEM areas (Science, Technology, Engineering and Maths), given that most STEM professions tend to be male-dominated. Indeed, research shows that in occupations dominated by males, such as teams of engineers, gender diversity has strong, negative effects on team performance, whereas in gender-balanced occupations, gender diversity has significantly positive effects on team performance both in terms of objective (e.g. financial outcomes, product quality) and subjective (e.g. self-rating, supervisor rating) measures. This suggests that integrating women into traditionally male-dominated fields may be difficult initially, but should get better as their representation approaches parity with men. These effects should accrue as greater participation of women in a setting allows for negative stereotypes to fade and for their expertise and contributions to be more accurately recognized. In examining scientific collaboration directly, there are no effects of teams' gender composition on productivity and innovation, but when women's influence in the group is misaligned with their expertise (i.e. they have more expertise than others attributed to them), the productivity of the team is negatively affected.

Gender inequalities in business engineering professions

Studies on gender in business, science and technology have produced conflicting results. The science faculty rated a male applicant as significantly more competent and hirable than an identical female applicant. Males also had a higher starting salary and were offered more career mentoring. On the other hand, such faculties preferred female applicants at a ratio of 2:1 over identically qualified males with matching lifestyles for

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tenure-track positions. Studies show parents are more likely to expect their sons, rather than their daughters, to work in a science, technology, engineering or mathematics field, even when their children perform at the same level in mathematics.

Women are highly under-represented on boards of directors and in senior positions in the private sector. Women candidates are far more likely than male candidates to be scrutinized and have their competence questioned by both men and women when they are seeking a position. A survey by the U.K. Office for National Statistics in 2016 showed that in the health sector 56% of roles are held by women, while in teaching it is 68%. However equality is less evident in other areas: only 30% of M.P.'s are women and only 32% of finance and investment analysts. In the natural and social sciences 43% of employees are women, and in the environmental sector 42%.

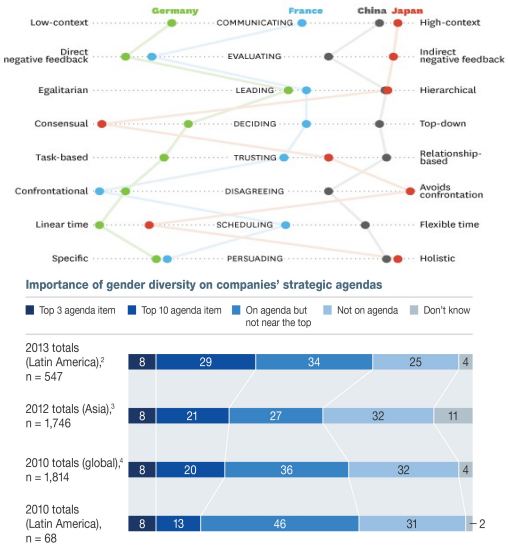

Fig. 5. Management styles across cultures and gender diversity cf. Erin Meyer, IMF data

The figure of the male researcher can be connected to the hegemonic masculinity that may be representative of the collective image of what masculinity means, a masculinity that is considered as normal and desirable. The experience of academia as organized according to assumed male norms & standards can be seen in the light of research arguing that academia shows a dominant masculinity, perhaps especially in engineering, which historically has been considered as dirty, hard and tough. Engineering culture and ethos have been regarded as extremely manly and thus unsuitable for women.

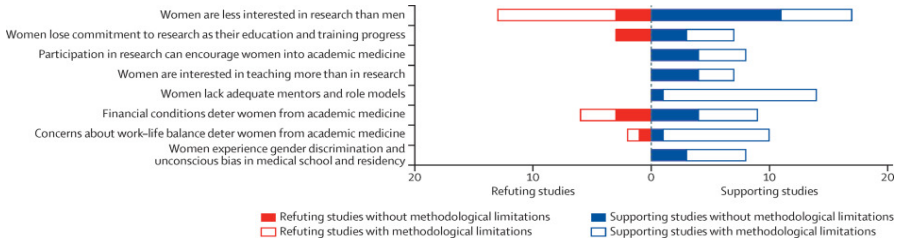

Fig. 6. Gender biased prejudices in research and business engineering professions

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Generally, men rate their technological skills in activities such as basic computer functions and online participatory communication higher than women. However, it should be noted that this is self-reporting, where men (over)evaluate themselves on their own perceived capabilities. Contrary to such findings, a carefully controlled study that analyzed data sets from 25 developing countries led to the consistent finding that the reason why fewer women access and use digital technology is a direct result of their unfavorable conditions and on-going discrimination with respect to employment, education and income. When controlling for these variables, women turn out to be more active users of digital tools than men. This turns the alleged digital gender divide into an opportunity: given women's affinity for ICT, and given that digital technologies are tools that can improve living conditions, ICT is a concrete and tangible opportunity to tackle longstanding challenges of gender inequalities in developing countries, including access to employment, income, education, health services. In point of property inheritance, many countries have laws that give fewer rights to women as compared to men.

Gender inequalities often stem from social structures that have institutionalized conceptions of gender differences, resulting in structural marginalization. Marginalization occurs on an individual level when someone feels as if they were on the margins of their respective society. This is a social process and displays how current policies in force can affect people.

Cultural stereotypes

Cultural stereotypes, which can dictate specific roles, are engrained in both men and women and these stereotypes are a possible explanation for gender inequality and the resulting gendered wage disparity. Gender stereotypes are greatly influenced by expectations: people determine their roles, appearance, and behaviors, according to them. When expectations of gender roles deeply rooted in people's minds, values and ideas, start to be distorted, they lead to situation stereotypes, which enforce ideas into actions and impose double standards.

Gender stereotypes limit opportunities of the different gender when their performance or abilities seem to be contrary to their gender-at-birth; women and men encounter limitations and difficulties when challenging the society through performing behaviors that their gender is not supposed to perform. Traditional concepts of gender stereotypes are being challenged nowadays in different societies and improvement can be observed.

Gender inequality and discrimination are argued to cause and perpetuate poverty and vulnerability in society as a whole. Household and intra-household knowledge and resources are key influences in individual skills to take advantage of external livelihood opportunities or respond appropriately to threats. High education levels and social integration significantly improve the productivity of all members of the household and improve equity throughout society. Gender Equity Indices seek to provide tools to quantify poverty. It originates in the gender wage gap, with women more likely to be living in poverty due to it.

The Millennium Development Goals fail to acknowledge gender inequity as a cross-cutting issue. Gender parity is measured in education, as proportion in employment and in national legislatures. Addressing gender inequality through social protection programs designed to increase equity would be an effective way of reducing gender inequality.

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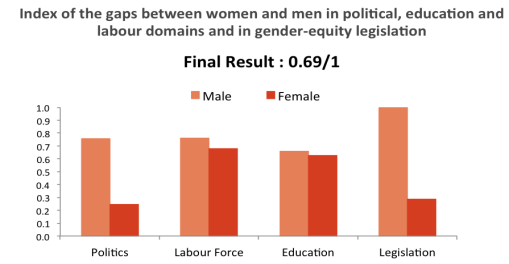

Fig. 1. Gender gaps in political, education and labour domains, cf. UNESCO CDIS

Existing research on the topic of gender and politics has found differences in political bias, beliefs, and voting behavior between men and women, although such differences vary across cultures. Gender is omnipresent in every culture, and while there are many factors to consider when labeling people, such as race and religion, gender is especially prominent in politics. Studying gender and political behavior poses challenges, as it can be difficult to determine if men and women actually differ in substantial ways in their political views and voting behavior, or if biases and stereotypes about gender cause people to make assumptions. However, voting behavior trends in men&women have been proved through research. These trends change with every generation, and factors such as culture, race, and religion also must be considered when discussing the affiliation.

Conclusions

Greater diversity and inclusiveness are part of a cultural transformation that requires time and practical reasoning. It needs a set of clear, measurable, and attainable long-term goals for management. Teams must be held accountable and accountability cascaded through the organization. It is widely known that without targets, nothing gets measured and nothing changes. This cultural transformation is not easy. It takes rigor and determination. It takes time to convince the others and help teams alter their perceptions for building organizations in which each employee can build a better future. An outstanding challenge is bringing more women into senior leadership positions with responsibility. Clearly, men have a role to play and hopes are high for the younger generation of men taking such issues more seriously and further advancing the arguments. Many requests from women (for flexible hours, parental leave, and other initiatives to improve work/life balance) have directly improved the quality of life for men as well. Expanding the business case explores the correlation between gender-balanced management teams and key performance indicators such as employee engagement, brand awareness, client retention, and financial metrics. Data clearly show that teams with a male-female ratio 40-60% produce results that are more sustainable and predictable than those of unbalanced teams.
The employee engagement rate of gender-balanced teams around the world increased by an average of four percentage points, against an average of one percentage point in the case of unbalanced teams. Similar findings show correlation between gender diversity and other business metrics, including consumer satisfaction and operating profit. Studies to date have looked extensively at the correlation between financial performance and women in leadership or on boards. The gender balance drives results

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at all levels of the organization. In addition, more women in the middle ranks enhance the candidate pool for top positions. The gender balance can only deliver results if it is systematically addressed throughout the organization.

For generations, the corporate world has largely adopted a male definition of leadership. Women can be just as ambitious and career driven as men, but they tend to have a different perspective on life. To succeed in developing a more diverse and gender-balanced work-force, corporate leaders must be prepared to stand up to their executive committees, driving commitment and ensuring accountability even if the initial perceptions may be negative. They have to do what they believe is right not just to improve an organization's performance but to create a better world.

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