Does pay transparency contribute to improving gender equality in the labour market? A review of the literature*

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Abstract

An increasing number of countries have introduced pay transparency policies with the aim of reducing gender inequality in the labour market. Firms subject to transparency requirements must disclose publicly or to employees' representatives information on their employees' pay broken down by gender, or indicators of gender gaps in pay and career outcomes. The argument at the base of these policies is that gender inequality may in part persist because it is hidden. On the one hand, employers rarely keep track of employees' pay and career progression by gender, and, on the other hand, employees rarely engage in conversations with their colleagues about pay. The lack of information on within-firm disparities by gender may therefore hamper progress toward a more egalitarian labour market. Transparency policies have the potential to improve women's relative pay and career outcomes for two reasons. First, by increasing the salience of gender gaps in the labour market, they can alter the relative bargaining power of male and female employees vis-à-vis the firm, and lead lower-paid individuals to demand higher pay from their employer. Second, together with pressures from employees, the public availability of information on firms' gender equality performance may also increase public pressure for firms' action in this domain. A clear message emerges from the literature analysing the impact of pay transparency policies on gender inequality: these policies are effective at pushing firms to reduce their gender pay gaps, although this is achieved via a slowdown of men's wage growth. Related results point to a reduction in labour productivity following the introduction of transparency mandates, but no detrimental effect on firms' profits, as this effect is compensated by the reduction in labour costs. Overall, the findings in this literature suggest that transparency policies can reduce the gender pay gap with limited costs for firms, but may not be suited to achieve the objective of improving outcomes for lower-paid employees.

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Introduction

While women's educational attainment has surpassed men's in most OECD countries, women are paid on average around 12.8 percent less than men in the developed world (OECD 2021) and make up only one third of managers (OECD 2017).

The gender literature has identified several factors that contribute to explaining the persistence of gender inequality in the labour market. First, the traditional division of labour in the family continues to play an important role as gender gaps in hours worked, wages and career outcomes exacerbate and often firstly appear with the birth of the first child (Olivetti and Petrongolo 2017, Kleven et al. 2019b). Second, gender differences in psychological traits, such as competitiveness, bargaining skills, confidence, willingness to lead, traits that are crucially shaped by social norms, help to explain gender differences in educational and career decisions (Shurchkov and Eckel 2018, Bertrand 2018). Third, while employers' explicit discrimination does not seem to play a key role, subtle forms of discrimination, but above all the unconscious influence that traditional stereotypes have on one's behaviour are potentially the most important factors for understanding the persistence of gender gaps in outcomes such as Maths performance, or the chance to be recruited in traditionally male-dominated positions (Bertrand and Duflo 2017, Carlana 2019, Azmat et al. 2020, Bertrand 2020).

Together with these factors, there is a growing discussion among policy makers and economists regarding the possibility that gender inequality persists in part because it is hidden (Baker et al. 2022). On the one hand, employers rarely keep track of pay levels and career progression by gender (Downing et al. 2015). On the other hand, employees, in part because explicitly discouraged by their employers, and in part because of salary taboos, rarely engage in conversation with their colleagues about their salaries (Cullen and Perez-Truglia 2018, Burn and Kettler 2019). The lack of information on within-firm gender gaps may therefore contribute to slowing down any progress in terms of gender equality in the labour market.

This is precisely the argument at the base of the many pay transparency policies that have been introduced across many countries in the last 15 to 20 years, where pay transparency refers to the requirement for firms to disclose information on employees' pay along the gender dimension. According to the OECD, by 2021, almost half of the OECD countries required private-sector companies to disclose information on their gender pay gap, either internally to employees and/or stakeholders, or to make them publicly available (OECD 2021).

Transparency policies have the potential to improve women's relative pay and career outcomes for two reasons. First, by increasing the salience of gender gaps in the labour market, they can act as an information shock that alters the relative bargaining power of male and female employees vis-à-vis the firm. In particular, the disclosure of information on gender inequality may lead lower-paid individuals to demand higher pay from their employer. Second, together with pressures from employees, the public availability of information on firms' performance in terms of gender equality may also increase public pressure for firms' action in this domain. Therefore, when designing and evaluating pay transparency policies, policy makers and researchers need to ask the following questions: to what extent the statistics that firms are required to compute provide new information to employers and employees? How does this information affect the bargaining power of both female and male employees? What triggers firms' reactions? It is also important to take into account that pay transparency policies do not prescribe how firms should improve gender equality. Together with these questions, it is therefore crucial to ask how firms respond to pay transparency policies: does pay transparency generate pay compression? And if so, is the pay distribution compressed from the bottom or the top? And are these effects driven by changes in firms' recruitment efforts and promotion outcomes?

This is the first set of questions that the increasing number of studies analysing the impact of pay transparency on gender equality has tried to answer (Bennedsen et al. 2021, Baker et al. 2022, Gulyas et al. 2022, Duchini et al. 2022). In a nutshell, the evidence provided by this literature can be summarised into four sets of results. First, there is a need for firms to collect within-firm gender equality indicators, as there is evidence that few employers do so if not explicitly mandated (Duchini et al. 2022). Second, while one study finds no effect of pay transparency on gender equality (Gulyas et al. 2022), generally employers react to transparency policies by decreasing the gender pay gap by 13-18 percent in the short-run (Bennedsen et al. 2021, Duchini et al. 2022) to up to 40 percent in the long run (Baker et al. 2022). However, this effect is driven by a slowdown of men's wage growth. Put it differently, pay transparency results in pay compression from the upper part of the wage distribution. This dynamic is consistent with a decrease in the relative bargaining power of high-paid employees vis-à-vis the firm, whereby under transparency, firms may push back requests for pay increases beyond the highest wage they show to be willing to pay. Third, while results are mixed in contexts where employees' pay information is only provided to employees, the two studies conducted in contexts where this information is publicly available consistently find that pay transparency leads to a reduction in the gender pay gap, pointing to the possibility that the public availability of gender gaps magnifies the disciplinary effects of information disclosure. Finally, there is some evidence in the context of Denmark and the UK that employers increase their efforts to hire more women and promote more women internally, though these effects have not yet translated into a significant increase in women's pay (Bennedsen et al. 2021, Duchini et al. 2022).

To evaluate the overall effectiveness of transparency policies, together with the impact on gender equality, one has to consider all the outcomes that can potentially be affected by these measures. In particular, pay transparency may have ambiguous effects on workers' productivity and retention. On the one hand, if firms react to transparency mandates by improving gender equality, pay transparency may boost the productivity and the retention of those employees for whom fairness is important. On the other hand, increased transparency could hurt job satisfaction of those employees who perceive that they are being treated unfairly, with negative knock-on effects on productivity and retention. In turn, depending on which effect prevails, transparency policies may increase or damage firms' profits. To provide a comprehensive picture of the effects of transparency, in what follows, a review of the findings of the literature regarding productivity, employees' retention and firm-level outcomes will be provided. In a nutshell, and consistent with previous studies on pay comparisons across employees, there is some evidence that pay transparency is accompanied by a decrease in labour productivity (Bennedsen et al. 2021), while there is no evidence of significant negative effects on employees' retention, and one study finds a positive effect on employees' retention (Gulyas et al. 2022). In turn, pay transparency has no significant effects on firms' profits, as negative effects on employees' productivity are compensated by the decrease in labour costs due to the slowdown of men's pay growth (Bennedsen et al. 2021, Duchini et al. 2022).

As the literature studying the impact of pay transparency on gender equality has started to consolidate, this review is a first attempt to take stock of its findings and formulate policy recommendations. The next section first presents alternative policies aimed at addressing gender inequality in the labour market.

The following discusses in details the potential implications of pay transparency for both the firm and the employees. Next, there will be a section dedicated to provide a summary of the common elements and differences of the pay transparency policies that have been put in place across different countries. The following two sections discuss the empirical evidence, and draw policy implications based on these findings. The last section concludes.

Policies aimed at addressing gender inequality in the labour market

Three broad factors play an important role to explain the persistence of gender inequality in the labour market: the traditional division of labour in the household, gender differences in psychological traits, and subtle forms of employers' discrimination. These factors are all shaped by persistent stereotypes about gender roles in the society (Bertrand 2020). This section briefly reviews some of the alternative policies and tools that have been proposed and implemented to limit the impact of these factors on women's career outcomes.

Paternal leave and child-care policies

A recent strand of papers shows that the birth of the first child leads to a substantial divergence in earnings of men and women, due to an immediate and persistent drop in female earnings (Angelov et al. 2016, Kleven et al. 2019a, Andresen and Nix 2022). According to the latest estimates produced by Kleven et al. (2020), this so-called long-run child penalty ranges from 21-26 percent in Scandinavian countries, to 31-44 percent in English-speaking countries and to 51-61 percent in German-speaking countries. It is in part driven by a drop in female employment (extensive-margin effect), especially in the first year after the child's birth, and a more long-lasting decrease in hours worked in the following years (intensive-margin effect). To address this child penalty, governments have introduced both parental-leave policies and child-care policies. While a full review of the rational and effects of these policies is outside of the scope of this article, three main conclusions could be drawn from the extensive literature on this topic (Olivetti and Petrongolo 2017). First, a moderate provision of paid maternity leave (up to 1 year) could increase women's attachment to the labour market, without being detrimental to their earnings.

In contrast, longer and more generously paid entitlements may be detrimental for female employment, and hence exacerbating the gender pay gap. Second, while the introduction of shared parental leave schemes and paid paternity leave is relatively recent, and hence it still premature to assess their overall effect, the evidence collected so far shows that these policies increase fathers' participation in child-care responsibilities in the short-run, but rarely have long-lasting effects in this respect and do not improve mothers' career outcomes (Ekberg et al. 2013, Kluve and Tamm 2013, Patnaik 2019). Third, affordable and high-quality child-care boosts both employment and hours worked of mothers, especially among single mothers and the low-educated, therefore contributing to reducing the gender pay gap (Lefebvre and Merrigan 2008, Cascio 2009, Givord and Marbot 2015, Nollenberger and Rodríguez-Planas 2015).

Affirmative action

A policy tool that has been increasingly used to address the unequal representation of men and women in high-paying professions is the introduction of gender quotas. Many electoral laws reserve parliament or local councils' seats to women. More recently, many countries have imposed gender quotas in corporate boards. Quotas have the obvious mechanical effect of increasing the representation of women in these roles. This, in turn, can provide role models for more inexperienced women, which could help them overcome a lack of confidence or willingness to lead. By exploiting a 1993 Indian law that reserved leadership positions for women in randomly selected village councils, Beaman et al. (2012) find, for instance, that female leadership influences adolescent girls' career aspirations and educational attainment. In principle, a larger presence of women in leadership positions may also help address dynamics of explicit or subtle discrimination, by reducing men's biases regarding women's ability to lead, as well as by favouring the promotion of other women. The evidence, in this respect is more mixed. On the one hand, Beaman et al. (2009) find that women are more likely to stand for, and win elected positions in Indian village councils required to have a female chief councilor in the previous two elections. On the other hand, in the business sector, Bertrand et al. (2019) find no robust evidence that the introduction of gender quota in firms' boards in Norway benefited a larger set of women, beyond those appointed to the boards. In sum, gender quotas are helpful in mechanically increasing the representation of women in male-dominated positions, but, at least in the short run, they do not always translate into more widespread improvements for other women.

Contrast to traditional stereotypes

Bertrand (2020) argues that policy makers, researchers and the media should focus on contrasting sticky traditional stereotypes that are key to understand gender differences in childcare chores and career trajectories after a child's birth, as well as gender differences in psychological traits. Crucially, stereotypes may reinforce themselves as parents, teachers, or employers take decisions regarding children, students, and employees under the lens of traditional stereotypes, or because true but small differences across genders are amplified by gender biases. Bertrand hence advocates in favor of informational interventions to contrast persistent stereotypes as well as individuals' mis-perceptions about the importance of certain social norms (Miyajima and Yamaguchi 2017, Bursztyn et al. 2020, Delfino 2021). And she also urges researches to document gender differences, as well as the absence of such differences and the importance of the context of study to shape choices and behaviours (Flory et al. 2015, Exley et al. 2020). The importance of traditional stereotypes in shaping gender identity norms and how to eradicate them is an extremely acting and fundamental area of research.

Conceptual framework

Information shock

Advocates of pay transparency policies argue that one of the reasons why gender inequality persists in the labour market is because there is limited and unequal information on employees' salaries. While aggregate statistics on the gender pay gap are widely available, neither employers, nor employees may be fully aware of the extent of gender disparities in their own firm, or in competing ones. For instance, according to a survey conducted in 2015 on behalf of UK government prior to the introduction of its pay transparency policy, out of 855 private and non-profit firms with at least 150 employees, only one third had ever computed their gender pay gap, and just 3 percent had made these figures publicly available. Moreover, up to 13 percent declared that staff were discouraged from talking about their pay with colleagues and 3 percent reported that their contracts included a clause on pay secrecy (Downing et al.

2015). In the U.S., Burn and Kettler (2019) report that approximately half of Americans are employed at firms where employees are forbidden or discouraged from discussing their pay with coworkers. Employees who violate these rules may be subject to punishment or dismissal. In addition to explicit pay secrecy clauses, or tacit employers' pressure, Cullen and Perez-Truglia (2018) show that "salary taboos", that is social norms around salary privacy that discourages coworkers from revealing or inquiring about salary information, are an important barrier to the diffusion of salary information across employees. By conducting a field experiment with 755 employees at a multi-billion-dollar corporation, the authors provide revealed-preference evidence that many employees are unwilling to reveal their salaries to coworkers and reluctant to ask coworkers about their salaries.

In the presence of such information frictions, pay transparency may act as an information shock both within and outside the firm. Such a shock can have different implications for female employees, male employees and the employers, which are discussed next in turn.

Employees' bargaining power

This information shock may strengthen the bargaining power of female employees vis-à-vis the firm for two reasons. First, pay transparency may enhance the ability of women who feel discriminated by their employers to challenge them in court. This channel may be especially important in settings characterised by high trade-union coverage, or in those countries who are traditionally more gender equal. Second, the value of women's outside options increases if the relative expected profit of filling a job with a female worker rather than a male one is now higher for employers; this is plausible under the assumption that disclosing evidence of gender gaps in favour of men damages a firm's reputation, with negative knock-on effects on profits.

As for men, transparency should have the opposite, but potentially symmetric effects on their outside options. Crucially, Cullen and Pakzad-Hurson (2021) present a model characterised by full transparency, which forces employers to reveal what they are willing to pay at most, and show that in such a context the bargaining power of individual employees, and especially the high-paid workers, may decrease, as employers can more easily push back any request for pay increases beyond the top wage that they have shown to be willing to pay. As men are more likely to be in high-paid positions than women, pay transparency may decrease male employees' chances to obtain pay increases and lead to lower average wages.

The employer's reaction

Pay transparency mandates may push firms to improve gender equality for several reasons. First, by forcing employers to compute statistics that they have potentially never considered, this may help them identify potential issues and underlying causes of gender gaps in their firm. While this may push only a minority of employers to act to close gender gaps, the second reason why many employers may actively respond is that pay transparency is likely to generate reputation and recruitment concerns for firms. Third, the information revealed, as well as the firms' subsequent responses may affect employees' productivity and retention, with potential negative effects on firms' profits. This paragraph focuses on the importance of the reputation motive, while the following paragraph is dedicated to the potential effects of pay transparency on employees' productivity and retention.

The publication of performance indicators and quality disclosure mechanisms is very common across different sectors, including hospitality, education and health sectors (Dranove and Jin 2010). One of the main justifications for these policies is that, when quality is imperfectly observed, providing information mitigates a moral hazard problem that distorts firms' incentives to invest in quality (Johnson 2020). Under the hypothesis that gender equality is a socially desirable outcome, imposing firms to provide gender equality indicators may push them to improve the quality of this workplace aspect. These disciplinary effects of pay transparency may be especially important in contexts where the performance indicators are publicly available for two reasons. First, the publicly availability of information may trigger reactions in the media, the stock market, and the general audience. This "blaming and shaming" mechanism has been shown to be effective at improving firms' performance in many contexts (Jin and Leslie 2003, Chatterji and Toffel 2010).[1] Second, firms themselves can compare their performance in terms of gender equality with that of other firms, and especially those that operate in their own sector. The behavioral economics literature suggests that when individuals receive information on their relative

[1] Importantly, Chatterji and Toffel (2010) show that firms that respond the most to third-party ratings of their corporate environmental activities are those that face lower-cost opportunities to improve or that anticipate greater benefits from doing so.

performance, those performing worst improve the most afterwards (Allcott and Kessler 2019). Firms subjected to transparency mandates may exhibit a similar behavioral response.

Importantly, pay transparency requirements leave room for firms' strategic reactions to improve their gender equality indicators, such as outsourcing low-paid and female dominated jobs. The section on policy design will provide a more in-depth discussion of this, advancing recommendations about the design of pay transparency policies.

Pay compression, recruitment and promotions

Until now the discussion has focused on how pay transparency may affect the relative bargaining power of male and female employees vis-à-vis the firm and why employers may react to transparency mandates by improving gender equality in their workplace. Through these two channels, pay transparency should in turn improve women's relative pay and career outcomes, but it is a matter of empirical analysis to document how this could happen. Firms may try to recruit high-talented women in high-paid positions, they may promote internally more women than men, and/or they may slow down men's pay growth. Which strategy firms chose could depend on many factors, including: the time horizon, as in the short-term it may be easier to slow down men's wage growth, while in the long-run firms may be able to attract and promote female employees; trade unions' strength and social preferences; firms' monopsony power, whereby employers with stronger power in the labour market may be more likely to cap men's pay growth than improving women's outcomes; and finally, firms' degree of competition in the product market, which may affect firms' ability to adjust labour costs.

While finding the empirical setting and the suitable data to compare the importance of these different factors may be challenging, two studies outside of the gender literature give consistent indications of employers' responses to pay transparency policies. First, Mas (2017) shows that a 2010 California mandate that required municipal salaries to be posted online led to a 7 percent reduction in top managers' compensations relative to cities that had already disclosed salaries. Second, by exploiting the staggered introduction of a U.S. state legislation protecting the right of workers to inquire about the salaries of their coworkers, Cullen and Pakzad-Hurson (2021), show that enhanced pay transparency decreases workers' wages by approximately 2 percent overall, with progressively smaller declines in occupations with higher unionisation rates. The section on empirical evidence shows that the results of the gender literature are remarkably in line with the findings of these two studies.

Employees' productivity and retention

While the primary goal of pay transparency policies is that of reducing gender inequality, disclosing information on employees' pay may also affect workers' job satisfaction, productivity and retention, and the direction of these effects is a priori ambiguous. On the one hand, learning about pay inequality in the workplace may decrease the job satisfaction of lower-paid employees, while the higher-paid may feel threatened by any attempt of the employer to mitigate inequality. In addition, the public disclosure of gender equality indicators induces comparisons across firms. Taken together, pay comparisons among employees within and outside the firm may lower overall employees' moral, which could in turn decrease labour productivity and make more employees quit. On the other hand, if firms respond to the policy by improving gender equality, this could boost the job satisfaction, productivity and retention of those workers who care about working in a fair environment.

A few papers outside of the gender literature provide evidence on the relationship between pay transparency and these outcomes. First, by randomly assigning a subset of employees of the University of California to receive information on a new website listing the pay of university employees, Card et al. (2012) find that workers with salaries below the median for their pay unit and occupation report lower pay and job satisfaction and an increase in the intention to quit, while those earning above the median are not affected by the information acquired. Similarly, Dube et al. (2019) find that, in the context of a big U.S. retailer, the probability of workers' quitting strongly increases in response to pay comparisons with higher-wage peers, suggesting concerns about fairness. Mas (2017) also finds that the 2010 California transparency policy almost doubled managers' quit rate, which has to be read together with the fact that wage cuts were larger in cities with higher initial compensation, but not in cities where compensation was initially out of line with (measured) fundamentals.

Related to this and in accordance with the "fair wage-effort hypothesis" (Akerlof and Yellen 1990), two contemporaneous studies show that workers' reaction is mitigated when the fact that some colleagues are paid more is perceived to be fair. In an experiment with Indian manufacturing workers, Breza et al.

(2018) randomise whether coworkers receive the same wage or differential wages according to their baseline productivity. When coworkers' productivity is difficult to observe, pay inequality reduces employees' productivity and cooperation with colleagues, and increases workers' absences. However, when workers can clearly perceive that their higher-paid peers are more productive than themselves, pay disparity has no effect on these outcomes. In a similar vein, by conducting an experiment at a big South-east Asian corporation, Cullen and Perez-Truglia (2022) show that employees do not react to cross-peers pay comparison, but they work harder on average, when they discover that their managers earn more than they thought. Taken together, these studies indicate that pay transparency reduces workers' productivity and retention only when the information revealed or the employer's responses are considered unfair. This point is especially important in the case of the gender pay gap, as the raw comparisons between men's and women's pay that are usually mandated by pay transparency policies do not allow to distinguish what part is explained by observable characteristics such as education or experience, and unobservable factors such as explicit discrimination, subtle discrimination, or implicit biases.

Policy design

This section summarises the main elements of pay transparency policies, focusing in particular on: *what* information this legislation asks firms to disclose; *who*, that is, which firms are targeted by these policies; *to whom* employers have to disclose the information on employees' pay; and whether the legislation establishes *sanctions* for non-compliers or for firms that do not manage to improve gender equality over time. Discussing these elements is important to the extent that each of them can influence how firms and employees respond to the introduction of transparency policies.

Information disclosed

The vast majority of transparency policies imposes the publication of pay levels by gender, often further broken down by occupation, while the UK stands out to be the only country where firms have to disclose raw, firm-level gender pay gaps. Also, to the best of the authors' knowledge, the Canadian setting is the only one where public sector institutions have to disclose individuals' pay above a certain threshold.[2] Disclosing pay levels by gender or the gender pay gap seems a subtle difference, but it actually determines the employees' comparison group. When employees acquire information on pay levels by gender they can compare their pay to that of the average worker of the opposite gender, but also to the average worker of their own gender. When workers acquire information only about the gender pay gap, the comparison with their own gender is shut down. Burn and Kettler (2019) show that recent U.S. state legislation allowing managers to enquire about colleagues' pay resulted into an increase in the gender pay gap among managers, as male managers started asking around more frequently about colleagues' pay and used this information more aggressively in pay negotiations than women. These results suggest that as long as an "ask gap" exists between men and women (Babcock et al. 2003, Bowles et al. 2007, Roussille 2022), the type of information revealed may influence who will take the most advantage of such information.

As for the breakdown by occupation, this may help identify where bottlenecks are in women's career progression, and which part of the within-firm gender pay gap depends on unobservable factors (Azmat et al. 2020). At the same time, disclosing pay information at a finer level may encounter firms' resistance, on the basis of privacy concerns, as many firms have only few employees in each occupation and hierarchy position. This may explain why many countries have opted for imposing firms to publish only more aggregate statistics, especially when this information is made publicly available. Finally, disclosing pay information at the individual level could be even more helpful at identifying pay gaps across otherwise similar individuals. In turn, the identification of "unfair" gaps could generate stronger pressure for action. At the same time, Perez-Truglia (2020) show that in Norway, the public availability of individual-level pay information has led to a significant reduction of individual's well-being, as many have used this information to engage in unpleasant comparisons with their friends and acquaintances.

[2] Norway also stands out as the only country where pay information on all citizens is publicly available online. This context is less relevant for the current discussion as this information is not directly linked to each person's employer, and therefore within-firm gender inequality is less salient.

Targeted firms

The public sector has often pioneered the introduction of pay transparency measures, under the argument that pay transparency could also increase the accountability of public sector employees (Mas 2017).[3] However, as of 2021, many OECD countries have imposed pay transparency requirements to private sector firms as well.

The other relevant dimension here is that of size, as these policies usually target large firms, potentially for two reasons. First, large firms may be more likely to have the infrastructure in place to compute the required statistics, and in particular a large enough HR office that could allocate resources to compute the relevant indicators.[4] Second, targeting only large firms may be enough to encourage smaller firms to voluntarily disclose pay information. Interestingly, the literature on information disclosure shows that voluntary disclosure rarely takes place (Dranove and Jin 2010), as bad-performing firms obviously prefer to avoid the potential reputation costs of disclosing their bad performance, and good-performing firms may hesitate as they do not know for how long their good performance will last. Consistent with these insights, the section on empirical findings shows that firms that are not targeted by transparency requirements rarely disclose information on their employees' pay.

Targeted audience

Pay transparency policies can be grouped into two sets of measures, depending on the audience to which the employees' pay information is disclosed. The majority of transparency laws impose employers to disclose this information to employees and employees' representatives. A minority of policies instead mandates that employers disclose employees' pay and career indicators publicly. As discussed in the section on the conceptual framework, by enhancing public scrutiny and enabling comparisons across firms, the public availability of this information has the potential to magnify the disciplinary effects of a

[3] Interestingly, Mas (2017) notes that the fact that the slow-down of public sector managers' pay following the introduction of pay transparency requirements in California was higher among managers with a higher initial compensation, but less related to managers' performance, is more consistent with public aversion to high compensation than the effects of increased accountability.

[4] Note that, in the UK, where the 2018 law targets only firms with at least 250 employees, the first year that gender equality indicators have been published, many firms made mistakes in their calculations, reporting for instance, pay gaps in levels rather than as percentage of men's pay. This suggests that these policies impose some administrative burden to firms that may potentially be larger for small firms who lack HR personnel.

transparency policy (Perez-Truglia and Troiano 2018, Luca 2018), as the results discussed in the section on empirical findings suggest.

Sanctions

In principle, two types of sanctions can be envisaged by pay transparency laws. A first set of penalties could be applied to employers who fail to comply with the reporting requirements. All the policies analysed by the gender literature envisage this type of sanction, for instance. Transparency laws may in principle envisage a second set of tougher penalties for those employers who fail to improve gender equality over time, though the authors are not aware of any country imposing such a sanction. The usefulness of sanctions will be expanded on in the section 'What works', but in general penalties may not be needed in contexts where employers have to disclose employees' information publicly as social pressure may be enough to ensure compliance. On the other hand, in settings where information is only disclosed within the firm, sanctions for non-compliers may be a useful tool for employees' representatives to ensure that employers disclose the required information.

Empirical evidence

So far, there are four studies that analyse the impact of pay transparency policies on gender equality (Bennedsen et al. 2021, Gulyas et al. 2022, Baker et al. 2022,Duchini et al. 2022).[5] Table 1 lists the characteristics of the settings considered along the criteria discussed in the section on policy design.[6] All the studies follow similar identification strategies that compare the evolution of pay (and career) outcomes of employees working in firms subject to transparency requirements, to trends in pay outcomes of workers employed in comparable firms that are exempted from the transparency mandates. The only exception in this respect is Baker et al. (2022), as the Canadian laws analysed in this paper impose that only salaries of public-sector workers above a certain threshold are made publicly available. Thus, the identification strategy adopted by Baker et al. (2022) exploits variation in the incidence of these cases

[5] Note that Duchini et al. (2022), has not been peer-reviewed yet.

[6] The information on sanctions mentioned for Canada is based on the law in Ontario - source:https://www.ontario.ca/page/public-sector-salary-disclosure-background-and-faq#section-11.

across university departments within provinces over time. This section summarises the findings of these studies.[7]

Employers' reaction

All, except for Gulyas et al. (2022) in the Austrian context, find that employers react to the introduction of pay transparency requirements by lowering the gender pay gap. Before discussing how they achieve this, it is important to note that the first important finding is that transparency mandates do induce employers to tackle the issue of gender inequality in their firm, which is consistent with the literature on the disciplinary effects of information disclosure policies (Dranove and Jin 2010). Also, in accordance with this literature, transparency policies that mandate employers to publicly report employees' pay statistics have been shown to be consistently effective at triggering employers' responses. In contrast, pay transparency policies have mixed effects in contexts where the information disclosed is not publicly available, but employers are only mandated to report pay statistics to employees' representatives: while Bennedsen et al. (2021) find that such a policy leads to a reduction of the gender pay gap in a traditionally egalitarian context such as Denmark, Gulyas et al. (2022) show that the equivalent Austrian policy has no effect on gender equality. This comparison between settings with public versus limited availability of information on employees' pay points to a potential important role of reputation motives and cross-firms comparisons in influencing firms' response, which is furthered discuss in the section dedicated to mechanisms.

Regarding the magnitude of the effects found, the estimated reductions in the gender pay gap compared to pre-policy means range from 13 to 18 percent in the short-run (Bennedsen et al. 2021, Duchini et al. 2022) to 40 percent in the long-run (Baker et al. 2022). Three things are important to interpret these estimates. First, it is remarkable that the short-run effects are very similar across different settings, potentially offering a solid benchmark for policymakers willing to introduce transparency measures.

Second, it is encouraging that the only paper that studies long-term effects, Baker et al. (2022), finds evidence of a persistent and larger impact of pay transparency policies compared to the short-term.[8]

[7] Note that the theoretical discussion on the role of employees' bargaining power is considered in the paragraphs dedicated to mechanisms.

[8] In this respect, it is also worth mentioning the study by Gamage et al. (2020) who compare wage trajectories of male and female professors employed in UK Russell Group universities before and after the introduction of a pay transparency policy in the university sector in 2007. The study finds that the log of salaries of female academics increased by around 0.62 percentage points compared to male counterparts following the introduction of the policy, corresponding to a 4.37 percent reduction of

On the one hand, these large effects may in part depend on the characteristics of the Canadian policy analysed, which targets the public sector and imposes the disclosure on a publicly available website of individual professors salaries. To begin with, the public sector may in general be held more accountable. Additionally, the public availability of such detailed pay information is likely to have generated additional pressure for action, especially from lower-paid professors of both genders. On the other hand, this is the only transparency policy among the ones considered here that had no explicit goal of improving gender equality. As such, it is especially remarkable that it achieved such a large reduction of the gender pay gap.

Third, transparency policies mainly reduce the gender pay gap by slowing down men's wage growth, and therefore do not seem to be suited either to achieve the objective of improving outcomes of lower-paid employees. Given the importance of this result, the next Section discusses its potential explanations and implications.

Men's and women's pay

Three out of four papers find that pay transparency policies reduce the gender pay gap. What is also remarkably consistent across these three studies is that the reduction in the gender gap is achieved through a slowdown of men's pay growth. In other words, pay transparency policies lead to pay compression from the upper part of the wage distribution. This result is consistent with the findings of Mas (2017) who shows that the transparency mandate implemented in California's public sector in the 2000s led to a reduction of top-paid managers' compensations. And it is perfectly in line with the theoretical insight first proposed by Cullen and Pakzad-Hurson (2021) that pay transparency increases the employer's bargaining power, especially vis-à-vis high-paid employees, as this can push back any pay increase beyond the maximum that it is already offering.

However, it is important to stress that pay transparency policies do not seem to improve women's pay outcomes. On the one hand, this null (relative) effect could be the result of both treated and control employers reacting to pay transparency policies by increasing women's pay. This would be consistent

the gender pay gap in this sector. In other words, the effect of this policy seems considerably smaller than the effect of the Canadian policy. However, it must be said that the two estimates are not directly comparable as those of Baker et al. (2022) are obtained from a triple difference model, while the estimates of Gamage et al. (2020) come from a double-difference model where both groups are effectively treated.

with the results of Johnson (2020) who finds that publicising a facility's violations of safety and health regulations generates a deterrence effect, whereby other facilities improve their compliance and experience fewer occupational injuries. Yet, at least Duchini et al. (2022) do not find visible reactions of either treated or control firms, when analysing trends in women's pay separately by treatment group, which should help exclude large general equilibrium effects. Moreover, at least in the UK setting, only a tiny minority of firms that are not targeted by the transparency law, voluntarily disclose gender equality indicators, confirming employers' reluctance to publish this type of information if not required to do so. On the other hand, firms may try to promote women internally from lower ranks and/or recruit externally women in high-paid occupations, and it may take some time for these effects to materialise. While the study offering a long-term perspective does not investigate these dynamics (Baker et al. 2022), Bennedsen et al. (2021) and Duchini et al. (2022) find two sets of results that are consistent with this employers' strategy. First, Duchini et al. (2022) find that the UK transparency policy increases the probability that treated firms post wage information in job postings, compared to the control group, an information that may be especially valuable for women who tend to bargain less than men (Babcock et al. 2003, Bowles et al. 2007, Leibbrandt and List 2015, Roussille 2022). In line with this, Bennedsen et al. (2021) find that the probability that treated firms hire female employees increases by 25 percent compared to control firms.[9] Second, Bennedsen et al. (2021) find a significant increase in women's probability to be promoted internally, though these effects have not translated in significant pay increases, potentially because the pay rises accompanying these promotions are not large enough to be detected in the entire sample.

Productivity and retention

Contrary to the first strand of papers on pay transparency, the gender literature has not focused extensively on outcomes such as employees' productivity and retention, with the exception of Bennedsen et al. (2021) who study both outcomes, and Gulyas et al. (2022) and Duchini et al. (2022) who analyse the effect of, respectively, the Austria's and UK's policy on employees' retention. While Bennedsen et al. (2021) do not have data on individual productivity, they focus on labour productivity measured as log sales per employee, finding that pay transparency is associated with a 2.7 percent drop in labour productivity,

[9] Duchini et al. (2022) find a similar result in difference-in-differences regressions that control for year and firm fixed effects, but the effect becomes insignificant when individual fixed effects are also included.

significant at 5 percent. These results are consistent with the hypothesis that pay comparisons across peers reduce workers' productivity when pay differentials are not perceived to be fair (Breza et al. 2018, Cullen and Perez-Truglia 2022).

As for the impact of pay transparency on employees' retention, neither Bennedsen et al. (2021) nor Duchini et al. (2022) find any significant or sizeable effect on employees' departure rates. Interestingly, Gulyas et al. (2022) find that separation rates of both men and women significantly decrease in treated firms compared to control firms, interpreting these findings as suggestive evidence that workers do not perceive the revealed pay schedules as unfair.

Mechanisms

This section discusses the mechanisms that have been analysed by the gender literature to explain why pay transparency policies lead to a reduction of the gender pay gap. First, the section discusses the role played by the public availability of gender equality indicators, and, in particular, whether this could magnify the disciplinary effects of information disclosure, by enhancing public scrutiny and enabling comparisons across firms. Next, it reviews the evidence on the importance of workers' bargaining power as proxied by trade-union membership.

Duchini et al. (2022) investigate the role of the publicly availability of the information disclosed in the context of the UK, where all firms with at least 250 employees have to disclose gender equality indicators publicly. The authors exploit two YouGov surveys that, since 2018, measure firms' reputation using representative samples of, respectively, British women and British employees, to show that worse performing firms obtain worse placements in both the Women's Rankings and the Workforce Rankings. Moreover, they show that the drop in men's real pay is larger in the two sectors, "Distribution and Hospitality" and "Banking and Finance", that are potentially the most exposed to public scrutiny, as measured by their presence in the YouGov surveys. Taken together, these two pieces of evidence suggest that the public availability of gender equality indicators enhances public scrutiny, which in turn stimulates firms' response.

But the public availability of this information also allows employers to compare their performance in terms of gender equality to that of other firms, and especially of those operating in the same sector.

This cross-firm comparisons could trigger a behavioural response, whereby worst performing firms improve their performance the most over time. At the same time, employers with a lower gender pay gap may find it easier to reduce it further after the introduction of transparency requirements. This is because, potentially, they may already employ a larger share of women, or because they may have already experimented with management practices aimed at enhancing gender equality, such as paternity leave schemes. Consistent with this theoretical ambiguity, the empirical evidence is mixed. On the one hand, Baker et al. (2022) show that in Canada, universities with an initial lower gender pay gap are more likely to reduce it after the introduction of pay transparency requirements. On the other hand, Duchini et al. (2022) find descriptive evidence that worse-performing firms reduce their gender pay gap the most over time. Interestingly, also Bennedsen et al. (2021) find support for this mechanism in Denmark, despite the fact that equality indicators are only disclosed internally in this setting. Still, the authors argue that the transparency policy may have increased the accountability of firms, as not only employees, but also some external stakeholders acquire the information disclosed.

In sum, by enhancing public scrutiny and enabling comparisons across firms, the public disclosure of the equality indicators appears to magnify the disciplinary effects of the policy (Perez-Truglia and Troiano 2018, Luca 2018, Johnson 2020).

Finally, only Baker et al. (2022) directly analyse the importance of workers' bargaining power in influencing firms' responses. In particular, they find that the effect of salary disclosure laws on the gender pay gap is more pronounced in unionised workplaces, consistent with the hypothesis that, following the introduction of these laws, trade-union help lower-paid employees put pressure on employers to reduce pay inequality.

What works

Before concluding, this review takes stock of the literature on the impact of pay transparency on gender equality, in order to produce evidence-based policy recommendations on the design of these laws. The recommendations are organised following the scheme introduced in the section on policy design.

Information disclosed

While providing more information may always be better in principle, the literature discussed in this review shows that men and women react differently to the information acquired. When the main goal is to reduce gender pay gaps, it thus seems reasonable to ask firms to publish percentage gender pay gaps by occupation and hierarchy position, together with additional gender equality indicators such as bonus gaps and the share of women in each cell considered. Breaking down gender gaps by occupation and hierarchy position - distinguishing, for instance, between assistant, associate and full professors in the academic sector - helps both employers and employees identify to what extent gender pay gaps are due to observable differences between men and women, such as the hierarchy position held. Also, while the focus of this review has not been on this element, the availability of information on bonus gaps will further help understand to what extent men and women are selected and self-select into tasks with different monetary returns, which often offer different career returns as well (Babcock et al. 2017). Importantly, the authors believe that all employees, including agency workers should be considered for the computation of equality indicators, in order to avoid strategic reactions by employers. For the same reason, mandating firms to provide information on the gender composition of each occupation/hierarchy cell helps prevent firms' strategic reactions, such as reducing the share of low-paid women, rather than increasing the proportion of high-paid female employees.

Targeted firms

The settings analysed by the literature so far show that firms do not disclose employees' pay information if not mandated to do so. For this reason, while privacy concerns and the organizational burden of computing gender equality indicators are important aspects to consider, policymakers may want to mandate that all firms, irrespective of their size, compute these statistics.

To take into considerations privacy concerns, which could be especially relevant for small firms with few employees per occupation/hierarchy position, disclosure requirements may vary by firm size. For instance, smaller firms may be required to publish only aggregate statistics by 1-digit occupational categories, while larger firms may be mandated to provide a finer breakdown by 2-digit occupation groups and hierarchy position. As for the organizational burden, policymakers may design computational programmes that make it easier for HR offices to calculate the gender equality indicators.

Targeted audiences

The studies presented in this review show that transparency policies mandating the public disclosure of employees' pay information are always effective at improving gender equality, while results are mixed when the information is only revealed to employees' representatives. While this is not conclusive evidence in favour of the public disclosure of information,[10] the studies discussed in the mechanisms section provide supporting evidence that, in settings where the information is publicly available, reputation concerns and cross-firm comparisons may influence employers' actions towards reducing gender inequality (Duchini et al. 2022). For this reason, policymakers may want to mandate that firms disclose equality indicators publicly in order to improve the effectiveness of transparency policies.

Sanctions

To the best of the authors' knowledge, the gender literature has not analysed the role of sanctions in influencing employers' responses to pay transparency policies. However, there is an extensive literature showing that social sanctions are often more effective than economic penalties at shaping organizations' and individuals' behaviors (Bowles and Polania-Reyes 2012, Bø et al. 2015). Potential sanctions on the inability to improve gender equality over time seem especially complex to design, as the reasons why there are gender pay gaps may differ across firms and sectors. As for sanctions on non-compliance with reporting requirements, their role may also be limited if reporting requirements are universal. Overall, the publicly availability of gender equality indicators, coupled with a large, if not universal, definition of targeted firms, should be sufficient in ensuring firms' compliance and encouraging their responses.

Conclusion

An increasing number of countries are introducing pay transparency policies with the aim of reducing gender inequality in the labour market. The rationale at the base of these initiatives is that gender in-

[10]The ideal experiment in this respect would entail randomising the public or private information "treatment" across firms in the same country and compare employers' reactions.

equality persists in part because it is hidden. On the one hand, employers rarely keep track of employees' pay and career indicators by gender, and, on the other hand, employees rarely engage in conversations with their colleagues about their pay. The lack of information on within-firm gender gaps may therefore contribute to slowing down any progress in terms of gender equality in the labour market.

This review is a first attempt to take stock of the consolidating literature on pay transparency and gender equality and to formulate policy recommendations. The main finding of this literature is that pay transparency policies are effective at pushing firms to reduce their gender pay gap, but employers achieve this through a slowdown of men's wage growth.

In light of previous results of the literature on pay comparisons among employees, a comprehensive assessment of these policies has to include their effects on labour productivity and employees' retention. In this respect, the gender literature points to a reduction in labour productivity following the introduction of transparency mandates, but there is no strong evidence that this effect is accompanied by increased workers' turnover. In turn, the decrease in productivity does not result into a detrimental effect on firms' profits, as it is compensated by the reduction in labour costs.

Overall, the findings of the literature suggest that transparency policies can reduce the gender pay gap with limited costs for firms, but may not be suited to achieve the objective of improving outcomes of lower-paid employees.

Considering all these results, to improve the effectiveness of pay transparency policies, policymakers may want to focus on four dimensions. First, it appears important to emphasise the gender dimension of the information disclosed by asking firms to publish gender gaps in pay and career indicators, rather than statistics broken down by gender. Second, breaking down gender pay gaps by occupation and hierarchy position would help to identify bottlenecks along the wage distribution and distinguish the importance of observable and unobservable factors in explaining pay gaps. Third, to take into account that firms do not disclose employees' pay and career information if not mandated to do so, policymakers may want to consider the possibility of enlarging the group of targeted firms. Finally, the gender equality indicators that firms are asked to calculate should be made publicly available, as the public disclosure of this information is likely to magnify the disciplinary effects of transparency policies, by enhancing public scrutiny and enabling comparisons across firms.

To conclude, it is important to consider that most pay transparency policies have only been recently introduced, which implies that the literature has mostly identified their-short term effects. On the one hand, it is possible that their effects fade away as pressure on employers from employees' representatives and the public audience weakens over time. On the other hand, if pay transparency policies contribute to change a firm's culture regarding gender equality, their effect may last over time and translate into absolute positive effects on women's pay and career outcomes.[11] In this respect, it is encouraging that the only paper that studies long-term effects, Baker et al. (2022) find a persistent and bigger impact of pay transparency on the gender pay gap. Having said this, it will be important to keep monitoring the long-term effects of pay transparency policies in other contexts to acquire a robust and full understanding of their implications.

[11] For instance, if pay transparency laws help reduce gender segregation across occupations and firms, then, as recently shown in Dahl et al. (2021), this could change men's attitudes about gender-specific skills and roles, with long-lasting beneficial effects on gender equality.

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Table 1: Studies on the impact of pay transparency on gender equality

Paper	Policy	Information disclosed	Targeted firms	Target audience	Sanctions	Findings
Bennedsen et al. (2021)	*Denmark*, Equal Pay Act no. 562, 2006: implemented since 2007.	Annual earnings by gender and occupation.	Public and private-sector firms with more than 35 employees.	The firm's employees through the employee representatives.	Fines for non-compliance with the law.	*Short-run*: 13% drop in gender pay gap, driven by a slowdown on men's pay growth; 25% increase in women's hiring rate; increase in women's probability of promotion; 2.7% drop in labour productivity; no effect on firms' profits.
Gulyas et al. (2022)	*Austria*, Equal Treatment Act and Federal Equal Treatment Act, staggered implementation between 2011 and 2014.	Average/median annual earnings by gender and occupation; number of employees within gender-occupation cell.	Public and private-sector firms: since 2011, firms with more than 1000 workers and since 2014 firms with at least 150 employees.	The firm's employees via work council or by displaying the information in a common room.	Fines or court orders for non-compliance with the law.	*Short-run*: precisely estimated zero effect on both the gender pay gap and women's and men's pay; 9% drop in separation rate of both men and women.
Duchini et al. (2022)	*UK*, the Equality Act 2010: implemented since financial year 2017/2018.	Firm-level mean and median hourly pay and bonus gaps; percentage of women in each quartile of the wage distribution.	Public and private-sector firms with at least 250 employees.	Public audience via dedicated government website and firms' websites.	Fines or court orders for non-compliance with the law.	*Short-run*: 18% drop in gender pay gap, driven by a slowdown of men's pay growth; worse performing firms and industries most exposed to public scrutiny improve gender equality the most; 9% increased probability of wage information in job postings; no impact on profits, pointing to a negative effect on labour productivity.
Baker et al. (2022)	*Canada*: staggered implementation since 1996.	Individual-level salaries of employees earning above a certain threshold.	Public sector firms (focus on universities).	Public audience via various public websites.	Cut of government's transfers for non-compliance.	*Long-run*: 25-40% drop in gender pay gap, driven by a slowdown of men's pay growth.