

AQ1 Does Pay Transparency Affect the Gender Wage Gap? Evidence from Austria[†]

By ANDREAS GULYAS, SEBASTIAN SEITZ, AND SOURAV SINHA*

We study the 2011 Austrian pay transparency law, which requires firms above a size threshold to publish internal reports on the gender pay gap. Using an event-study design, we show that the policy had no discernible effects on male and female wages, thus leaving the gender wage gap unchanged. The effects are precisely estimated, and we rule out that the policy narrowed the gender wage gap by more than 0.4 p.p.. Moreover, we do not find evidence for wage compression within establishments. We discuss several possible reasons why the reform did not reduce the gender wage gap. (JEL J16, J31, J71, K31)

Gender disparity in earnings is a persistent feature of labor markets around the world. Women earn about 23 percent less than men in the United States, 20 percent in Austria, and 15 percent on average across the European Union.¹ There is an ongoing debate among academics, policymakers, as well as the general public about the reasons behind the gender wage disparity and about the best policy instruments to close the gap.²

One policy instrument that has recently received widespread attention is some form of pay transparency legislation, whereby firms are required to provide information on pay disparities between genders. Proponents of transparency argue that the lack of information on pay sustains the gender gap and transparency helps women to challenge discriminatory pay schedules.³ However, critics worry about administrative costs and that men might use the information revealed by transparency more actively than women, further widening the gender pay gap instead.

*Gulyas: University of Mannheim (email: andreas.gulyas@uni-mannheim.de); Seitz: University of Mannheim and ZEW (email: sseitz@mail.uni-mannheim.de); Sinha: Yale University (email: sourav.sinha@yale.edu). Erzo F.P. Luttmer was coeditor for this article. We thank two anonymous referees and Joseph Altonji, Andreas Haller, Costas Meghir, Cormac O’Dea, Johanna Rickne, Sebastian Sieglöcher, Han Ye, and seminar participants at the RGS Doctoral Conference in Economics, CRC-TR 224 workshop, Stockholm University, European Commission DG ECFIN, the European and North American Econometric Society Summer Meetings 2021, IIPF 2021 meeting, and the RES Annual Conference for their helpful comments. Support by the state of Baden-Württemberg through bwHPC and the German Research Foundation (DFG) through grant INST 35/1134-1 FUGG and through CRC TR 224 (Project A3 and Project C01) is gratefully acknowledged.

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¹Eurostat (2018).

²See Blau and Kahn (2017) for a review.

AQ2 ³For example, the European Commission writes in the Factsheet on Pay Transparency (2019) “[...] the effective enforcement of the right to equal pay [...] for women and men remains a major challenge, partly because of a lack of information on pay.” https://ec.europa.eu/info/sites/info/files/factsheet-pay_transparency-2019.pdf.

Nevertheless, these policies have garnered widespread attention among policymakers, and variants of it have been introduced in Finland, Sweden, Norway, Denmark, Austria, the United Kingdom, Germany, Iceland, and the United States.⁴ Despite its recent introduction in many countries, the causal evidence of transparency laws on wages and the gender wage gap is scarce. This paper studies the Austrian transparency law to fill this gap.

The Austrian transparency law was rolled out in phases, starting off with the largest firms in 2011. Over the next three years, smaller firms were brought under coverage, and by 2014 all firms with more than 150 employees were required to publish and update income reports every second year. These reports must contain annual gross income, itemized by gender and occupation groups as defined in the respective collective bargaining agreements. However, wage reports are company secret and not public information. Using the universe of Austrian social security records, we exploit the size-based cutoff rule and employ an event-study design to estimate the causal effects of pay transparency on wages and the gender wage gap.

In our baseline specification we focus on a narrow window around the lowest cutoff to make the control group as comparable to treated establishments as possible. We do not find evidence that transparency has any discernible effect on the gender wage gap. The point estimate is close to 0, precisely estimated, and we can rule out that the policy narrowed the gender wage gap by more than 0.4 percentage points. When we study the effects on wages of men and women separately, we again do not find any statistically or economically significant effects. Therefore, transparency seems to have failed in its twin objectives of reducing the gender pay gap and boosting female earnings. We show that this conclusion holds under a number of alternative specifications using different control variables and alternative sample restrictions on top-coding, firm size windows, and compliance with treatment assignment. We further consider the full rollout of the policy across all firm size groups and show that transparency did not affect the gender wage gap in large firms either.

While pay transparency does not affect average wages, it could potentially lead to wage compression within establishments. Yet again, we find no evidence for this. The variance of log-wages within treated establishments evolves in tandem with the control group, with no discernible effect of the policy. Furthermore, we do not find heterogeneous effects for workers earning below or above the establishment-level gender-specific median wage.

Why does pay transparency not affect the gender pay gap and wage setting in general? Surveys of worker representatives and works councils reveal that compliance was universal and a majority of respondents found the reports informative and useful.⁵ Therefore, imperfect implementation seems an unlikely explanation.

Our data do not allow us to definitively pin down the reasons behind the lack of policy effects. Nevertheless, we highlight several possible channels why the policy might not be effective in narrowing the gender wage gap. First, wage reports

⁴In the United States, during President Obama's tenure, the Equal Employment Opportunity Commission (EEOC) proposed changes that would have required firms with more than 100 employees to provide annual reports on gender pay gap to the Department of Labor. This move was subsequently rolled back by President Trump. (See Obama EEOC Action on Pay Data collection).

⁵Arbeiterkammer (2014).

are legislated to be company secret and therefore can only affect within-firm wage differences. Without wage reports being public, they cannot affect the differential sorting patterns of men and women, which we show to be a major contributor to the gender wage gap in Austria.⁶

In addition, it could be that within firms, the pay gap between men and women in the same occupation is too small for the employee to initiate a renegotiation.⁷ Alternatively, workers might lack the bargaining power to renegotiate wages since firms are not required to act upon unequal firm pay policies. If workers have low bargaining power but feel unfairly compensated, we would expect them to have lower job satisfaction and higher quit rates (Card et al. 2012; Rege and Solli 2015; Dube, Giuliano, and Leonard 2019). In Austria we find that pay transparency leads to a reduction in separation rates in treated firms. This is perhaps indicative that transparency alleviated previously held concerns about unfair pay schedules among workers and increased their job satisfaction.

Our work contributes to a small literature studying the effects of transparency in very specific labor markets, which typically documents unintended consequences of such policies. Schmidt (2012) and Mas (2016) show that mandated disclosure of CEO compensation leads to “ratcheting” effects, whereby CEOs who earned below the average received a pay raise. Using a field experiment in an online labor market, Cullen and Pakzad-Hurson (2019) document that transparency led to overall wage reductions. Baker et al. (2019) show that a public sector salary disclosure law for university faculty in Canada reduced the gender wage gap, though partly by lowering male wages.

Our paper is one of the first to document the effects of a broad introduction of pay transparency. The most closely related studies are Bennedsen et al. (forthcoming); Duchini, Simion, and Turrell (2020); and Blundell (2020), which analyze similar policies in Denmark and the United Kingdom. These studies show that similar to Austria, pay transparency in both countries failed to achieve its goal of increasing female wages. However, in contrast to our study, they find that transparency moderately depressed male earnings and thus, slightly narrowed the gender wage gap. We argue that transparency policies can potentially have a larger impact on the gender wage gap if the wage reports are public information. This can guide women in their job search toward more equitable and higher-paying firms. This could be one of the reasons why the UK reform, which makes gender wage gaps public information, was more successful compared to Austria in closing the gender wage gap.⁸

More broadly, our work is related to the literature that studies the effects of information about relative earnings on behavioral and labor market outcomes: municipal salary disclosure on pay compression among city managers (Mas

⁶International evidence also points toward the importance of sorting for the gender wage gap (Card, Cardoso, and Kline 2016; Morchio and Moser 2019).

⁷Our data lack detailed occupation information, and thus we cannot compute the within-establishment, within-occupation gender wage gap.

⁸The Austrian and Danish transparency reforms share many institutional features; if anything, the Austrian policy is more strict. Both reforms do not mandate to make the pay reports public, and nevertheless, the Danish policy has led to a reduction in the gender wage gap. Further research is needed to better understand whether there are cross-country differences in how workers and firms engage with pay transparency policies and whether transparency interacts with other labor market institutions.

2017), publicly available tax records on happiness and life satisfaction in Norway (Perez-Truglia 2020), perceived peer and manager salaries on effort and output (Cullen and Perez-Truglia 2022), pay inequality on attendance and output in India (Breza, Kaur, and Shamdasani 2017), relative earnings on worker effort (Cohn et al. 2014) and on happiness and life satisfaction (Clark and Oswald 1996; Luttmer 2005; Brown et al. 2008; Clark, Kristensen, and Westergård-Nielsen 2009; Godechot and Senik 2015).

The rest of this paper is structured as follows. In Section I we describe the pay transparency law in detail. Section II lays out a conceptual framework for transparency policies; Section III explains our data, sample selection, and our empirical strategy. We present our results in Section IV, we discuss the potential reasons behind the ineffectiveness of the reform to affect wage setting in Section V, and the last section concludes.

I. Institutional Setting and the Pay Transparency Policy, 2011

In international comparisons, Austria has a relatively high gender pay gap. The unadjusted gender pay gap was 20 percent in 2017, being fifth highest in the European Union.⁹ A commonly raised point in the public debate in Austria is that pay secrecy is a major obstacle to achieving equal pay because women might not know the degree of pay discrimination or have less precise information about pay schedules compared to their male colleagues.

In light of these debates, the Austrian government introduced a pay transparency law in 2011, serving two explicit goals: first, boosting female wages and second, thereby reducing the gender wage gap. To achieve these goals, firms have to produce and update internal gender pay gap reports every second year, disaggregated by occupation groups. These reports must include the number of employees within a gender-occupation cell and their average or median annual earnings, expressed in full-time equivalents. All components of pay must be included, but there is no obligation to separate them. It is important to note that employers have no discretion about the occupational groups, but they have to follow the predefined classifications in collective bargaining agreements.¹⁰ Managerial positions are exempt from reporting requirements.

In principle, workers are almost universally covered by collective bargaining agreements. These define minimum wages at the industry level for different occupations, but firms and workers are free to bilaterally agree on wages above this floor. We are not aware of any precise evidence on the fraction of workers paid above required levels, but evidence on the wage structure suggests that they are not very binding. Differences in firm pay policies explain almost the same fraction of wage inequality in Austria as in the United States, suggesting that firms have a lot of

⁹Source: Eurostat (online data code *sdg_05_20*)

¹⁰The collective bargaining agreements are quite detailed in their occupational categories. For example, the wholesale and retail sector, which is the collective bargaining agreement with the highest number of employees in Austria, has eight predefined occupational categories, nine firm tenure groups, in addition to two regional categories.

flexibility in setting their pay policies and are not much constrained by the collective bargaining agreements.¹¹

In comparison to pay transparency legislation in other countries, the Austrian version is stricter and more detailed in various characteristics. First, to protect the anonymity of individuals, if fewer than three employees fall within a certain gender-occupation group, they are counted with the next larger occupational group. This is more comprehensive compared to Denmark and Germany, where firms have to aggregate cells with ten and seven employees, respectively. The UK legislation is on an even more aggregated level, as it does not require a breakdown of income statistics by occupation. Second, reports must be made available to all employees via works councils where they can be accessed by any employee. In the absence of a works council, the report must be put on public display in a “common (break) room.” Failure to compile these reports can lead to monetary fines and being directed by the courts to produce them. The wage reports are legislated to be company secret. Workers can discuss the contents of the report with their colleagues, union representatives, and legal advocates. However, communication of the contents to the outside is prohibited. Firms have no obligation to make these reports public, yet many public sector firms make theirs available online (see online Appendix Table A1).

The implementation of the legislation was staggered over four years. Firms with more than 1,000 workers came under the legislation in March 2011. Then in January of each subsequent year, firms with more than 500, 250, and finally 150 employees became subject to the reporting requirements in 2012, 2013, and 2014, respectively. Firms that grow and exceed the 150-employee threshold after 2014 have to produce a report in the first year they exceed the threshold. In 2011, about 30 percent of the Austrian workforce became subject to the legislation, which grew to 50 percent of workers by 2014 (see online Appendix Figure A1). There are no other policy changes or legal requirements that specifically apply to these cutoffs and especially the 150-employee cutoff used in our baseline study.

Exploratory nonrepresentative surveys conducted by the Austrian Chamber of Labor (*Arbeiterkammer*), the Austrian Trade Union Federation (OeGB), and the Austrian Federal Ministry for Education and Women’s Affairs (AFMEW) in 2014 and 2015 study the level of compliance among firms and the dissemination of reports to employees.

Evidence from these surveys (Arbeiterkammer 2014; Deloitte 2015) show near-universal compliance with the policy.

Reports were shared with works councils promptly, and information was distributed most frequently via intranet, announcements, employee newsletters, etc. In more than half of the cases, council representatives reported close cooperation with their employers in preparing the reports, and 80 percent reported that their employers were open to adopting measures addressing the gap.

We do not have precise information about what fraction of workers actively use the wage reports, but there is no reason to believe that pay reports are not widely known. The media regularly reports about the gender wage gap. In particular, this

¹¹ See Gulyas and Pytka (2020) for evidence on Austria and Lamadon, Mogstad, and Setzler (2020) for the United States.

topic receives widespread attention on the so-called Equal Pay Days.¹² Around these dates, most newspapers and news stations discuss the existing gender pay gap in Austria, its roots, and pathways to closing it. Pay reports are featured prominently in this debate, especially in the first four years after the reform.¹³ We take this regular news coverage as evidence that the general public (and especially workers) are aware of the issue at hand and pay reports as a way of addressing it. In addition, as mentioned above, the fact that many works councils are directly involved in the preparation of the wage reports suggests that this information should also percolate to workers.

II. Conceptual Framework

How should we expect pay transparency to affect the wage setting process? It has long been recognized that observationally similar workers are paid differently in the labor market. A recent literature emphasizes the role of firm pay in understanding wage differences across workers, which has been shown to explain around a third of the overall wage variation.¹⁴ In models with frictional labor markets, more productive firms are willing to pay higher wages, as their opportunity cost of a vacancy is higher (Postel-Vinay and Robin 2002; Cahuc, Postel-Vinay, and Robin 2006). Since search is a time- and resource-intensive process in such frameworks, both parties would be willing to accept a range of wages. These range from reservation wages holding the worker to their outside option, up to wages where the worker appropriates the firm's maximum willingness to pay. Typically, a particular bargaining protocol is assumed, where wages are pinned down by the bargaining power of workers. In such settings, wage differences within firms could arise due to differences between workers' bargaining power and outside options.

A less researched aspect in search frameworks is that asymmetric information between employers and workers and informational differences across workers about firms' willingness to pay can lead to differential wage outcomes. Therefore, pay transparency can alleviate these informational frictions and in turn affect wages and other labor market outcomes. If workers have different information about firms' output and willingness to pay, they would achieve different bargaining outcomes.¹⁵ In particular, women might have less information than their male colleagues, possibly because of smaller workplace networks.¹⁶ These information gaps could generate

¹²There are two Equal Pay Days in Austria: The first is in spring and marks the day until which women "work for free" in a given year based on the gender pay gap. The second is in fall and marks the date by which men would have earned the same annual income as women in a full year (so to speak, from that day on, women work for free relative to men for the rest of the year).

¹³See, for example, <https://www.tt.com/artikel/3502362/online-gehaltsrechner-soll-fuer-transparenz-sorgen> (accessed February 16, 2021) or <https://www.kleinezeitung.at/politik/innenpolitik/5298933/Equal-Pay-Day-Frauen-verdienen-in-ihrem-Leben-435000-Euro-weniger> (accessed February 15, 2021).

¹⁴See, e.g., Abowd, Kramarz, and Margolis (1999); Card, Cardoso, and Kline (2016); Song et al. (2019); among many others

¹⁵See, for example, the framework in Cullen and Pakzad-Hurson (2019).

¹⁶Previous research shows that women are less informed about their market value than men (Babcock and Laschever 2003), more private about their pay than men (Goldfarb and Tucker 2011), and communicate about pay with their peers less often than men (Cullen and Pakzad-Hurson 2019). According to a Glassdoor (2016) survey, globally, 59 percent of men versus 51 percent of women believe they have a good understanding of how pay is determined at their company.

pay disparities both within and across gender lines. Transparency by design reveals more information about firms' willingness to pay and unequal pay schedules. If wage reports are company secret, this information empowers only current workers to challenge gender pay gaps and pay disparity in general. Instead, if wage reports are public, workers and especially women can direct their search toward more equitable and higher-paying firms.

Beyond wages, transparency can affect job turnover through changes in job satisfaction. If workers perceive that they are underpaid and have little bargaining power to demand higher wages, we would expect them to have lower job satisfaction and higher quit rates (Card et al. 2012; Rege and Solli 2015; Dube, Giuliano, and Leonard 2019). In contrast, job satisfaction and retention might increase if within-firm transparency alleviates previously held concerns about unfair compensation.

On the firm side, transparency can induce firms to reduce wage dispersion out of equity concerns when large differences within the company become salient and information in wage reports begins to serve as reference points in negotiations. In addition, if wage reports are public information, wage and gender pay gap differences across firms would invite public scrutiny and criticisms that might pressure firms to correct their wage policies.

To summarize, internal wage reports can in theory be an effective policy tool to address wage differences within companies. But the above discussion makes it clear that transparency will only affect wage setting under certain conditions. The Austrian transparency legislation only requires firms to compile wage reports but does not mandate them to act upon pay gaps. Therefore, it becomes the workers' responsibility to challenge pay disparities. First, assuming that wage renegotiations entail some costs on the part of the worker, the revealed wage differences must be perceived as unjustified and large enough to warrant acting upon them. Second, workers must have the bargaining power to use this new information and demand higher wages. And finally, transparency as enacted in Austria only addresses information frictions in wage setting due to differences in knowledge about firms' willingness to pay. If workers already had good information about how much their coworkers earn on average and therefore, their employers' willingness to pay, it is likely that within-firm transparency would have no effects on the wage setting process.

In conclusion, it is a priori not clear whether internal wage reports will affect the gender wage gap and wage setting in general. Therefore, the empirical evaluation of the Austrian pay transparency policy not only estimates the efficacy of transparency legislation but also the importance of informational differences in wage setting. Before we delve into these results, we describe our data and empirical strategy in the next section.

III. Data and Empirical Strategy

We use administrative employment records from the Austrian social security administration from 1997 to 2018 in our analysis. These data comprise of day-to-day information on the universe of employment spells subject to social security (Zweimüller et al. 2009). The data contain information on the yearly income at

the person-establishment level, broken down by regular wages and bonus payments. The data further contain basic sociodemographic information of workers, such as age, gender, and citizenship. Except a flag for blue-collar jobs, the dataset does not contain information on workers' occupation. Each establishment has a unique identifier, and we merge with these data information on its geographic location, four-digit NACE industry classification, as well as (from 2007 onward) the firm size of the establishment's parent company. The information about overall firm size is crucial since the law applies to firm size and not establishment size.

We select all employment spells from 2007 to 2018. For each worker-year pair, we select the dominant employer based on yearly income. This yields over 41 million person-year observations. Table 1 presents descriptive statistics about the overall employment population as well as our estimation sample. The adjusted gender wage gap is above 20 percent in our dataset, although the true gender pay gap conditional on observables is likely much smaller. The social security dataset contains only few worker characteristics, but studies using survey data with a larger set of controls find the adjusted gender wage gap to be 7.2 percent in 2013 (Böheim, Fink, and Zulehner 2021). For each worker-year observation, we compute the daily wage as yearly earnings from the dominant employer divided by the number of days employed at that establishment deflated to 2017 prices. One caveat of the administrative data is that they do not contain information on hours worked. Thus, we are only able to analyze the response of total daily wages and not the hourly wage response.

To make our control group as similar as possible to treated establishments, we focus our analysis on establishments that became subject to the law in 2014, i.e., establishments the firm size of which was within a window around the 150 size threshold. Large firms are likely very different from the small firms in the control group, both along observed and unobserved dimensions of worker and firm characteristics, and so we drop them for our baseline estimation. In our main sample, we select all establishments with firm size between 75 and 225, but we consider robustness checks with other firm size windows as well as estimating the effect of the reform including establishments from all larger firms.

Since the social security administration only records income up to the maximum contribution limit, wage information is top-coded, which applies to 6 percent of our sample.¹⁷ As we cannot observe any change in wages for this group, we drop top-coded spells in our baseline sample. Table 1 shows that this selection does not change the worker composition much. In additional checks we explore the robustness of our results to either including top-coded individuals or excluding workers who were ever top-coded during our study period.

These sample restrictions leave us with close to 4.9 million worker-year observations, generated by 1,204,251 workers employed across 14,303 distinct establishments. The worker and establishment characteristics of our baseline sample are overall quite similar to the whole population. The only significant difference is that

¹⁷In 2016, the maximum monthly earnings used to calculate contributions was €4,860. There were no substantial changes in the maximum contribution threshold in Austria during our study period. It was essentially only valorized each year by the inflation rate.

TABLE 1—SAMPLE RESTRICTION AND COMPOSITION

| | (1) | (2) | (3) | (4) | (5) |
|-------------------------------|------------|-----------|-----------|-----------|-----------|
| Fraction female | 0.469 | 0.417 | 0.435 | 0.442 | 0.426 |
| Fraction Austrian | 0.758 | 0.744 | 0.735 | 0.761 | 0.750 |
| Fraction manufacturing | 0.174 | 0.244 | 0.242 | 0.279 | 0.235 |
| Fraction blue collar | 0.427 | 0.474 | 0.507 | 0.512 | 0.514 |
| Age (yrs) | 38.9 | 38.9 | 38.4 | 38.2 | 38.0 |
| Establishment-tenure (yrs) | 6.3 | 6.4 | 6.1 | 6.1 | 5.8 |
| ln(daily wage) | 4.389 | 4.459 | 4.411 | 4.407 | 4.401 |
| Gender wage gap | 0.363 | 0.369 | 0.339 | 0.358 | 0.329 |
| Adj. gender gap | 0.237 | 0.239 | 0.222 | 0.222 | 0.222 |
| Separation rate | 0.128 | 0.117 | 0.121 | 0.122 | 0.128 |
| Fraction top-coded | 0.057 | 0.067 | 0 | 0 | 0 |
| Observations | 41,429,703 | 5,269,153 | 4,914,038 | 1,039,328 | 1,651,146 |
| Workers | 5,784,925 | 1,242,885 | 1,204,251 | 328,134 | 529,099 |
| Establishments | 539,254 | 14,495 | 14,303 | 4,949 | 9,265 |
| Dominant employers | ✓ | ✓ | ✓ | ✓ | ✓ |
| 75 ≤ firm size ≤ 225 | | ✓ | ✓ | ✓ | ✓ |
| Top-coded removed | | | ✓ | ✓ | ✓ |
| Treated establishments (≥150) | | | | ✓ | |
| Control establishments (<150) | | | | | ✓ |
| Year < 2014 | | | | ✓ | ✓ |

Notes: The table shows the composition of the sample under different sample restriction criteria. Column 3 is our main sample used in the baseline specification. Columns 4 and 5 show the sample means respectively for the treated and control group of establishments in pretreatment years (2007–2013). The adjusted gender wage gap was computed by controlling for Austrian citizenship, a quartic age polynomial, work experience, establishment, and year fixed effects.

manufacturing jobs are somewhat overrepresented in the baseline sample. They comprise 24 percent of all jobs, whereas the manufacturing share in the overall population is only 17 percent.

In our baseline sample, we assign treatment status based on the firm size in 2013, just before firms with 150–250 employees became subject to the policy in 2014. The last two columns in Table 1 show that the treatment and control establishments had similar worker and establishment characteristics in the years before the policy was rolled out.

To estimate the causal effect of pay transparency on the gender wage gap as well as on male and female wages, we apply the following event-study model:

$$\begin{aligned}
 (1) \quad y_{ij(i,t)t} = & \sum_{k=2007}^{2018} \beta_1^k \mathbf{1}\{t = k\} \times Male_i \times Treat_{j(i,2013)} \\
 & + \sum_{k=2007}^{2018} \beta_2^k \mathbf{1}\{t = k\} \times Treat_{j(i,2013)} + \beta_3 Male_i \times Treat_{j(i,2013)} \\
 & + \sum_{k=2007}^{2018} \gamma_k \mathbf{1}\{t = k\} \times Male_i + \lambda_i + \lambda_j + \lambda_t + \varphi \mathbf{X}_{it} + \epsilon_{ij(i,t)t}
 \end{aligned}$$

where i denotes a worker employed in establishment $j(i,t)$ in calendar year t . $\mathbf{1}\{t = k\}$ is a year dummy that takes the value one if k equals t and zero otherwise. $Male_i$ denotes the gender dummy that takes the value one if individual i is male. $Treat_{j(i,2013)}$ denotes the treatment indicator, which equals 1 if an establishment

belongs to a firm that has 150 to 225 employees in 2013 and 0 otherwise.¹⁸ \mathbf{X}_{it} is a vector of individual, time-varying controls: it contains a quartic polynomial in age and its interaction with gender. λ_i denotes the individual worker fixed effect. λ_j and λ_t , respectively, denote the establishment and calendar year fixed effects. Our outcome variable of interest is the log of daily wages at the worker-establishment-year level. We drop 2013 from the summation terms (i.e., the event-study coefficients β_1^k , β_2^k , γ_k , and λ_t .) Thus, the event-study coefficients β_1^k on the triple interaction term measure the percentage points change in the gender wage gap in treated establishments relative to the control group and the base year 2013. If the pay transparency reform is effective in reducing the gender pay gap, the coefficient β_1^k will be negative for $k > 2013$, i.e., the posttreatment years. Conversely, a positive coefficient implies that the gender pay gap has opened up. In addition, we are interested in the effects of pay transparency on male and female wages separately. The gender-specific effects are measured with the coefficients β_2^k for females and $\beta_1^k + \beta_2^k$ for males. Standard errors in all our analyses are clustered at the establishment level.

Our two-way fixed effects strategy implies that our effects are identified within-establishment and within-worker, i.e., the additional effect of this pay transparency reform after controlling for unobserved but time-constant worker and establishment characteristics. Workers who stay with their employers before and after the policy contribute to these effects only if their wages change as a result of the policy. This is also true for workers who move across establishments. Consequently, our results are not driven by sorting of higher-individual fixed effect workers to higher-paying establishments, which could be different across genders.¹⁹

We estimate equation (1) for our baseline sample, i.e., establishments the firm size of which is around the lowest size cutoff of the reform to ensure their comparability with respect to (un)observables. Under the assumption that establishments of larger firms exhibit the same parallel trends, we can analyze the full staggered rollout of the reform. To this end, we are applying a staggered difference-in-difference design for all treated establishments, again accounting for response heterogeneity over time. We modify equation (1) as follows:

$$(2) \quad y_{ij(i,t)t} = \sum_{k=-4}^4 \beta_1^k \mathbf{1}\{YST = k\} \times Male_i \times Treat_{j(i,2010)} \\ + \sum_{k=-4}^4 \beta_2^k \mathbf{1}\{YST = k\} \times Treat_{j(i,2010)} + \beta_3 Male_i \times Treat_{j(i,2010)} \\ + \sum_{k=2007}^{2018} \gamma_k \mathbf{1}\{t = k\} \times Male_i + \lambda_i + \lambda_j + \lambda_t + \varphi \mathbf{X}_{it} + \epsilon_{ij(i,t)t}$$

¹⁸ Assigning the treatment status based on the 2013 firm size is equivalent to estimating an intent-to-treat effect. To account for initial-treatment status violators in postreform years, we consider a robustness exercise by estimating equation (1) for only those establishments that comply with their initial treatment assignment, thus not exceeding (dropping below) the 150 employee cutoff post-2013. We refer to this sample as the “Complier Sample.” Complying firms account for 76 percent of worker-year observations in our baseline sample.

¹⁹ In an alternative specification we include establishment-worker match fixed effects directly controlling for potential “assortative” matching. Both point estimates and confidence intervals are not sensitive to this alternative specification.

where all variables have the same definition as above except that we now define the treatment status based on the firm size in 2010 and replace the year dummy $\mathbf{1}\{t = k\}$ with a “years-since-treatment” (YST) dummy $\mathbf{1}\{YST = k\}$. We choose 2010 as the base year for defining the treatment status, as this is the last pretreatment year for the largest firm size group (more than 1,000 employees). Moreover, we replace the year dummy by the years-since-treatment dummy because the different firm size groups are treated at different points in time. Hence, we re-center the actual treatment for each establishment at YST equal to zero, which corresponds to different calendar years for each treatment group, e.g., 2011 for the largest firm size group (more than 1,000 employees) and 2014 for the smallest firm size group (150–249 employees). We include four pre- and posttreatment years in our analysis, which corresponds to the number of pre-/posttreatment years we can observe for all treated firm size groups. Before presenting our results, we briefly discuss two key identifying assumptions for unbiased estimates in our context. First, we have to impose the parallel trend assumption: The gap between male and female wages in the control (75–149 employees) and treatment group (150–225 employees) exhibits the same trends absent any policy change. If this holds, we can attribute any posttransparency deviations between the groups to the policy. While not directly testable, the estimated coefficients β_1^k for pretreatment years show that the difference in the gender wage gap between treated and control groups is not significantly different from zero (see Figure 2). Note that this also precludes anticipation effects: if treated establishments respond to the reform prior to the actual reform date, for example, by eliminating unfair pay practices, then this would also show up as a deviation from the parallel trend assumption.

A second concern is that firms use the time between the implementation of the reform in 2011 and its effective date in 2014 to downsize and locate themselves right below the 150-employee cutoff, thus avoiding treatment in 2014. If the worst offenders (largest gender pay gap) among this sample move below the cutoff, then our estimates will be biased toward zero. To show that this does not pose a threat to identification, we show in Figure 1 that the firm size distributions are almost identical in 2010 and 2014, and there is no evidence of bunching around the threshold.

In online Appendix Figure A2, we check for violations of intended treatment rule by establishments after the policy was implemented, and in online Appendix Figure A3, we plot the year-on-year transitions of establishments in treated and control groups across the size cutoff. These figures additionally show that even though there were some violations of the intended treatment rule, the proportions are in line with pre-policy firm size dynamics, thus further ruling out strategic bunching.

IV. The Effects of Pay Transparency

A. Effects on Gender Wage Gap and Wages

In line with the primary goal of the Austrian pay transparency law, we begin by examining its effect on the gender gap in daily wages. Panel A of Figure 2 shows the estimated coefficients β_1^k from equation (1), which measure the evolution of the gender wage gap (male wage premium) in treated establishments relative to those

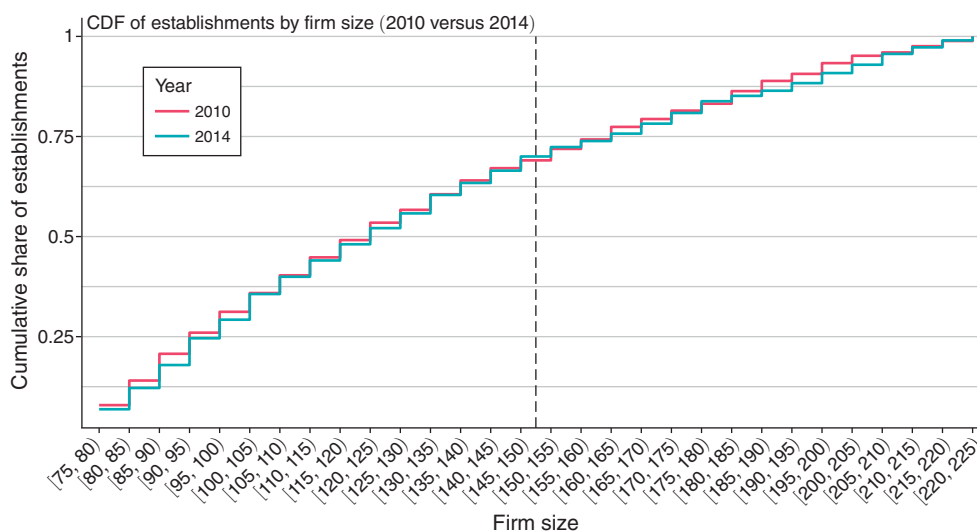


FIGURE 1. CUMULATIVE FIRM SIZE DISTRIBUTION OF ESTABLISHMENTS IN BASELINE SAMPLE

Notes: The figure shows the cumulative distribution function of the firm size distribution for our baseline sample in 2010 (before the policy was announced) and 2014 (1 year after the policy was fully implemented for all firms with more than 150 employees). The figure shows that there is virtually no change in the size distribution between these two years.

in the control group. First, we check that the parallel trend assumption is satisfied. Studying the coefficients in pretreatment years, we find little evidence for any statistically and economically distinct evolution of the gender wage gap in treated versus control establishments. There is a noticeable but statistically insignificant dip in the gender wage gap around the Great Recession. In online Appendix Figure A4, we show that this dip occurs in both treated and untreated establishments and is only somewhat (by about 0.5 percentage points) more pronounced in treated establishments. By the time the policy is implemented in 2014, the gender wage gap in both groups had recovered to their prerecession levels.

Posttreatment, we also find little evidence for any significant and economically meaningful effects of the reform on the gender wage gap. The gender wage gap between the treated and control group started opening up only in 2015, and we can rule out at the 95 percent confidence level that during our study period the policy narrowed the gender wage gap by more than 0.4 p.p.

In panels B and C, we plot the effects on male ($\beta_1^k + \beta_2^k$) and female (β_2^k) wages, respectively. Female wages are virtually unchanged after 2013, whereas male workers in treated establishments have seen a modest increase of 0.25 p.p. compared to the control group. Both effects are statistically insignificant, although they are precisely estimated. At the 95 percent confidence level, we can rule out that the reform affected wages by more than 0.5 percentage points in the years immediately after the rollout and by more than 0.8 p.p. toward the end of our study period. Overall, there is little evidence to suggest that transparency has any economically significant effects on female workers.



FIGURE 2. EFFECTS OF PAY TRANSPARENCY ON GENDER WAGE GAP AND DAILY WAGES

Notes: The figure plots the evolution of the gender gap in daily wage (panel A), male (panel B), and female wages (panel C), in treated establishments relative to the control group in log points (equation (1)). The sample is restricted to establishments of firms with 75–225 employees. Treatment is assigned to establishments of firms that had more than 150 employees in 2013. Standard errors are clustered at the establishment level. The standard error spikes represent 95 percent confidence intervals. All regression results can be found in online Appendix Table A2.

While our baseline sample focuses on firms around the threshold to make our control and treatment group as comparable as possible, we next investigate whether transparency had an effect in larger firms by studying the full rollout over all firm size groups. Figure 3 presents the estimation results for β_1^k from the staggered difference-in-difference model detailed in equation (2). Again, these coefficients inform us about the evolution of the gender pay gap (male wage premium) in treated establishments relative to those in the control group. Including all firm size groups eventually treated does not change the results found in the baseline sample. There are no discernible pre-trends, and posttreatment there is little evidence for any significant and economically meaningful effects on the gender wage gap. As above, these effects are precisely estimated, and we can rule out any effect greater than 0.5 p.p. in the 3 years following the policy introduction.²⁰

Since pay reports are only available to current employees, the reports might have a limited impact on wages of newly hired employees. Even after joining a company

²⁰In independent work, Böheim and Gust (2021) confirm our main findings using a regression discontinuity design.

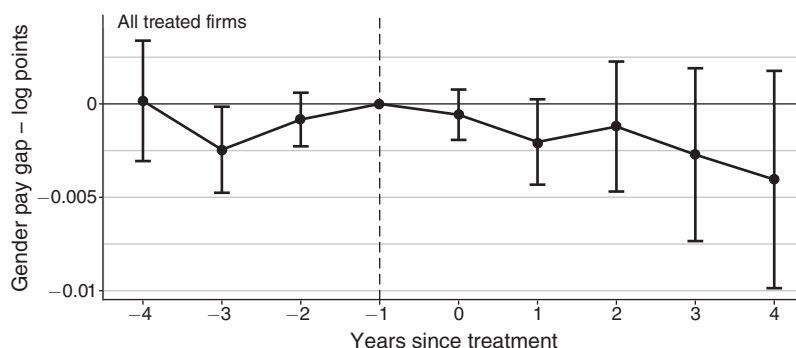


FIGURE 3. EFFECTS OF TRANSPARENCY ON GENDER WAGE GAP (GWG)

Notes: The figure plots the evolution of the gender gap in daily wages in treated establishments relative to the control group in log points based on the staggered difference-in-difference model in equation (2). The sample is restricted to establishments of firms above 75 employees. Treatment is assigned based on the 2010 firm size, and the treatment time is re-centered around 0, which is the first treatment year. We drop years outside our event window. Standard errors are clustered at the establishment level. The standard error spikes represent 95 percent confidence intervals.

with a pay report, it might take some time until the employee is able to act upon the information provided in the wage reports and renegotiate their contract. Therefore, it is possible that transparency has significant effects only for those who have been with their current employer for a while. To investigate whether this group drives our zero results, we reestimate equation (1) on the sample of workers with above 3.5 years of establishment tenure, which is the median value in our baseline sample. The results displayed in Figure 4 show that there are no discernible effects of transparency for high-tenure workers.

B. Robustness Checks

In the online Appendix we show that the results of our baseline specification hold under multiple robustness checks with different sample and treatment definitions. In online Appendix Figures A5 and A6, we restrict our sample to establishments with firm size between 100 and 200 employees and 125 and 175 employees in 2013, respectively. In contrast to our main analysis sample, we include all top-coded workers in online Appendix Figure A7 and drop all ever-top-coded workers in online Appendix Figure A8. For online Appendix Figure A9, we include only those establishments that do not change their intended treatment assignment based on their firm size in 2013. We also change the definition of treatment in the following two ways. In online Appendix Figure A10, we define establishment treatment status based on their firm size in 2010 instead of 2013. For online Appendix Figure A11, we assign treatment status to workers (instead of establishments) depending on whether they worked in an establishment with a firm size greater than 150 employees in 2013. In online Appendix Table A2, we reestimate the gender wage gap results for our main sample with match fixed effects instead of worker and establishment fixed effects.

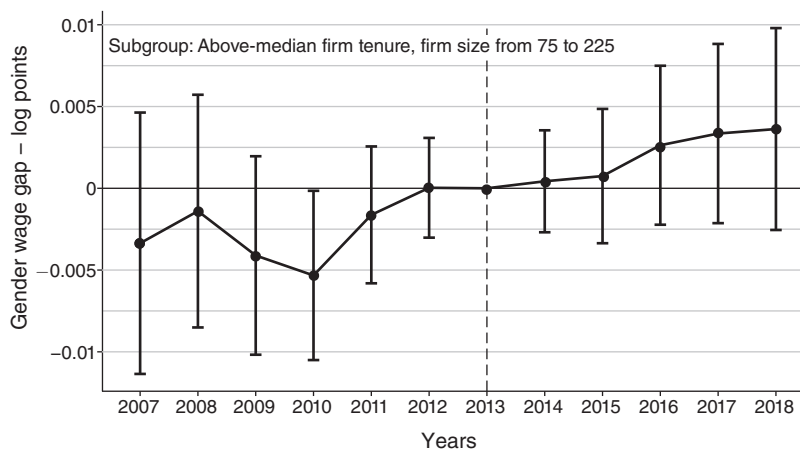


FIGURE 4. EFFECTS OF TRANSPARENCY ON GENDER WAGE GAP (GWG)

Notes: The figure plots the effects of pay transparency on the gender wage gap for workers with above-median tenure, where we compute firm tenure in 2013, the year before treatment. The sample is restricted to establishments of firms with 75–225 employees in 2013. Standard errors are clustered at the establishment level. The standard error spikes represent 95 percent confidence intervals.

Finally, in online Appendix Figure A12, we reestimate the effects of transparency at the establishment-year level and thus on the establishment-level gender wage gap.²¹

All these specifications confirm our main results: pay transparency had no economic or statistically significant effects on the gender wage gap and individual wages.

C. Pay Transparency and Wage Dispersion

What explains the lack of any discernible effects of transparency on male and female wages? Perhaps the policy only led to wage compression, leaving the average wage unaffected. Wage increases for workers earning below average might have been compensated by wage reductions for highly paid individuals. To check whether this was indeed the case, we estimate the effects of the pay transparency on the establishment-level variance in male and female wages separately by estimating the following model in our baseline sample:

$$(3) \quad wvar_{jt} = \sum_{k=2007}^{2018} \beta^k \mathbf{1}\{t = k\} \times Treat_{j(2013)} + \lambda_j + \lambda_t + \epsilon_{jt},$$

where $wvar_{jt}$ is the gender-specific variance in log daily wages in establishment j in year t , $Treat_{j(2013)}$ is a dummy that takes the value 1 for any establishment j the

²¹Online Appendix Section A.5 describes the regression specification in detail.

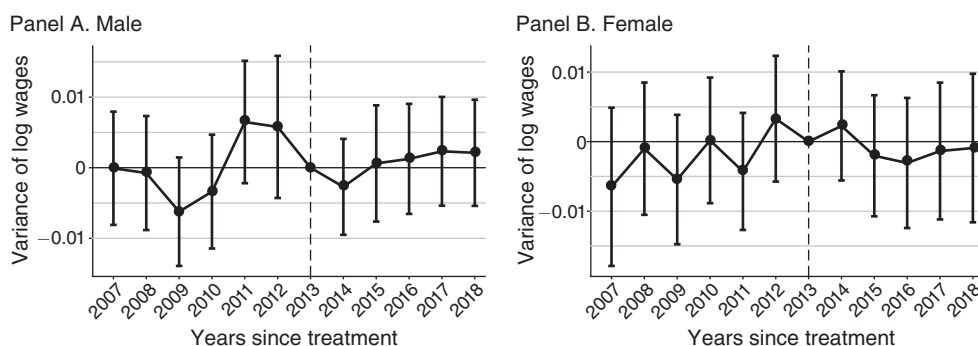


FIGURE 5. EFFECTS OF PAY TRANSPARENCY ON ESTABLISHMENT-LEVEL WAGE VARIANCE

Notes: The figure plots the effects of transparency on the establishment-level variance in daily wages for male and female workers separately (equation (3)). The sample is restricted to establishments of firms with 75–225 employees in 2013. Standard errors are clustered at the establishment level. The standard error spikes represent 95 percent confidence intervals.

parent firm of which is larger than 150 employees in 2013, and the other variables
 AQ3 have the same interpretation as in (1). A negative β_k coefficient implies that the variance narrowed in posttreatment years relative to the control group, which implies wage compression. The results are displayed in Figure 5. There are no discernible pre-trends in wage variances for either men or women. We do not find statistically significant effects of transparency on the establishment-level variance in log wages for either men or women. The mean of the establishment-level variance of log wages is 0.097 for males and 0.176 for females in the year before treatment. Thus, at the 95 percent confidence level, we can rule out that transparency narrowed establishment-level wage dispersion for men or women by more than 5 percent relative to the baseline mean.

An alternative way to study the effects of the policy on wage compression is to estimate the impact separately on workers earning below and above their respective gender-specific median establishment wage. In the online Appendix, Figure A13 shows that the policy had little effect on the wages of any subgroup. All in all, we do not find any compelling evidence for wage compression within establishments.²²

V. Why Was the Reform Not Effective?

Why did the Austrian pay transparency law fail to narrow the gender wage gap? As we have already discussed in Section I, the Austrian policy is in many aspects stricter than comparable laws in Europe, and there was near-universal compliance with the policy. According to a survey of works councils (Arbeiterkammer 2014), in 54 percent of cases, employers cooperated with works councils in generating pay reports; 71 percent of respondents reported that the reports are informative, and

²²Including establishment-year level aggregates in (3) does not change our results.

63 percent claimed that they are useful for works councils. Therefore, incomplete implementation and workers' unawareness are unlikely to explain the lack of policy effects.²³

As argued in the conceptual framework, transparency can only be effective if the within-occupation and within-firm gender wage gaps are large enough. The absence of detailed occupation information in the social security data does not allow us to quantify this gap. However, previous work (Böheim, Fink, and Zulehner 2021) that controls for occupation information has found the adjusted wage gap in Austria to be 7.2 percent in 2013. Thus, within-firm and within-occupation gender differences are likely to be even smaller.²⁴

Even if the transparency reform revealed large gender differences in firm pay policies, transparency itself might not remedy these differences. The Austrian pay transparency legislation does not require firms to act on revealed pay differences. Instead, it is the workers' responsibility to use the information provided to bargain for higher wages. Thus, the policy's ineffectiveness could also be grounded in low bargaining power of workers. If the reports show evidence of pay discrimination or unfair wage differences, but workers lack the bargaining power to renegotiate wages, we would expect job satisfaction to decline. In contrast, we would expect job satisfaction to increase if transparency leads workers to revise downward their priors about unfair compensation. The social security data do not have a direct measure of job satisfaction, but we can use turnover rates as a proxy.²⁵ Past research has shown that workers who feel unfairly compensated have lower job satisfaction and higher quit rates (Card et al. 2012; Rege and Solli 2015; Dube, Giuliano, and Leonard 2019).

To study this channel, we estimate the effect of the policy on overall job separation rates by dropping the additional gender interaction from equation (1):

$$(4) \quad \text{sepa}_{ijt} = \sum_{k=2007}^{2018} \beta^k \mathbf{1}\{t = k\} \times \text{Treat}_{j(i,2013)} \\ + \sum_{k=2007}^{2018} \gamma_k \mathbf{1}\{t = k\} \times \text{Male}_i + \lambda_j + \lambda_i + \lambda_t + \varphi \mathbf{X}_{it} + \epsilon_{ij(i,t)t}$$

where $\text{sepa}_{ij(i,t)t}$ is one if individual i separated in period t from establishment j , and the rest of the variables follow the same definitions as in the baseline equation (1). As before, the year 2013 is omitted from the estimation of β^k , γ_k , and λ_t .

Figure 6 shows that the transparency policy reduced the annual separation rate significantly in treated firms relative to the control group by over 1.1 p.p., which is a 9 percent reduction compared to pretreatment levels.²⁶ In online Appendix

²³ As mentioned in Section I, gender pay gap in Austria is prominently discussed in the media twice a year on "Equal Pay Days," once in spring and then again in fall. Pay reports are also often discussed in this context.

²⁴ This is also consistent with findings in Card, Cardoso, and Kline (2016), who show that within-firm gender pay gaps in Portugal are close to zero and sorting explains the overwhelming majority of gender wage differences.

²⁵ Since pay reports are internal, we would not expect workers' outside options to change and therefore to confound effects on quit rates.

²⁶ The separation rate is 0.122 in treated firms before the reform; see Table 1.

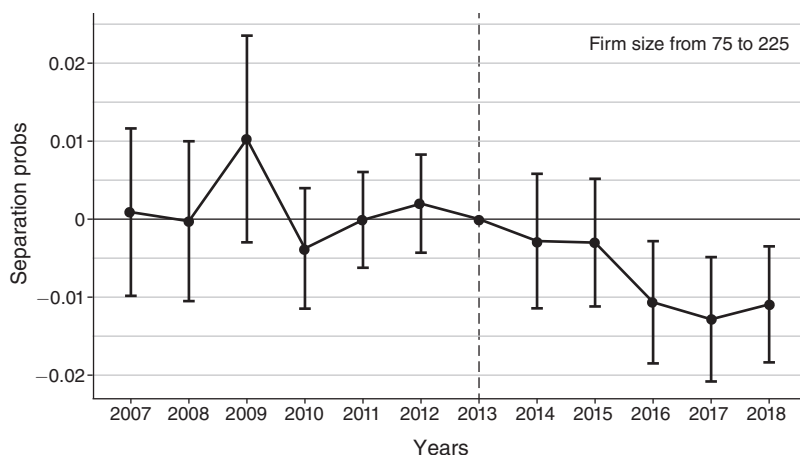


FIGURE 6. EFFECTS OF TRANSPARENCY ON GENDER WAGE GAP AND DAILY WAGES

Notes: The figure plots the effects of pay transparency on the year-on-year separation rate equation (4). The sample is restricted to establishments of firms with 75–225 employees in 2013, and we pool male and female workers. Standard errors are clustered at the establishment level. The standard error spikes represent 95 percent confidence intervals.

Figure A14, we show that these effects are similar for men and women.²⁷ The reduced turnover rate is perhaps indicative that transparency alleviated previously held concerns about unfair pay schedules among workers in general, as well as unfair gender pay gaps.

In addition, the Austrian transparency policy by design does not target an important determinant of the gender pay gap—the fact that men sort into better-paying firms compared to women. Table A3 in the online Appendix shows that in Austria, gender differences in sorting explain around 10 percentage points of the unadjusted gender wage gap. But since wage reports are legislated to be company secret and hence, not publicly available, they cannot directly affect the sorting component. Therefore, transparency legislation that requires firms to publicly disclose pay statistics, such as in the United Kingdom, could be more effective in closing the gender gap in firm pay (Duchini, Simion, and Turrell 2020).²⁸ An additional advantage of the public nature is that the reported wage gaps can be discussed in the media, which makes the policy more salient and can also put additional pressure on firms to equalize earnings (Blundell 2020).²⁹

Independent of the specific reasons why the Austrian transparency reform was not successful in narrowing the gender wage gap, requiring firms to act upon revealed

²⁷We estimate the gender-specific effects of transparency on job separation using the specification of equation (1).

²⁸Another example is Canada, where public access to information about the salaries of university faculties led to a reduction in the gender wage gap (Baker et al. 2019).

²⁹The *Independent*, a newspaper in the United Kingdom, regularly publishes the worst offenders in terms of gender pay gap based on the UK transparency reform. <https://www.independent.co.uk/news/business/news/gender-pay-gap-worst-offenders-each-sector-revealed-reporting-deadline-passes-a8290566.html>.

wage differences or mandating wage reports to be public might lead to a more effective transparency policy.

VI. Conclusion

Pay transparency is often prescribed as an instrument to close the gender pay gap and reduce wage inequality. In this paper, we study the causal effects of the 2011 Austrian pay transparency law, which requires firms above a certain size threshold to publish reports on gender pay gap.

Using an event-study design and administrative data from social security records, we show that the transparency policy neither affected male and female wages nor did it narrow the gender wage gap. These effects are precisely estimated, and we can rule out at a 95 percent confidence level that the policy narrowed the gap by more than 0.4 p.p. by the end of our study period. We further show that this zero effect is not driven by wage compression, where wage increases below the median are compensated with wage cuts above the median.

In addition, we find that pay transparency leads to a reduction in separation rates in treated firms. Past research has shown that workers who feel unfairly compensated have lower job satisfaction and a higher quit rate (Card et al. 2012; Rege and Solli 2015; Dube, Giuliano, and Leonard 2019). Therefore, the lower separation rate might point toward higher job satisfaction and is perhaps indicative that transparency alleviated previously held concerns about unfair pay schedules among workers.

Our data do not allow us to definitively pin down the reasons behind the lack of policy effects on the gender wage gap. However, policies that require firms to act upon revealed wage differences or mandate wage reports to be public might be more effective in narrowing the gender wage gap.

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