

Is Pay Transparency Good?

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The well-known case of Lilly Ledbetter suggests that information about the pay of coworkers can empower low earners to stand up to pay discrimination. In 1998, Ledbetter received a covert message from a male colleague sharing his salary and alerting her to the differences in the paychecks that she had received compared to 15 other all-male “area managers” at the same company, with similar experience and doing the same work. She used this information to press legal charges against her employer for unfair compensation. Her case became the basis for the 2009 Lilly Ledbetter Fair Pay Act, which removed the statute of limitation for pay discrimination lawsuits (Phillips 2009).

It is tempting to infer from this case that greater transparency in salaries would help more disadvantaged workers to negotiate for higher pay. That reasoning has supported the passage of many pay transparency mandates (European Commission 2017; Obama 2014). The public discussion around Ledbetter’s high-profile case, however, reflects narrow thinking about the impact of pay transparency. Such reasoning ignores how employers respond to greater transparency by changing their hiring and pay strategies. It also ignores outcomes beyond pay gaps, like productivity and wage levels. Plus, the case focuses on only one kind of pay transparency, transparency between peers doing the same work. But what happens when the pay of the boss or boss’s boss becomes transparent, when pay information circulates beyond a single business to workers in competing businesses, or when the hiring manager who sets the wage learns about other wages being offered to a candidate?

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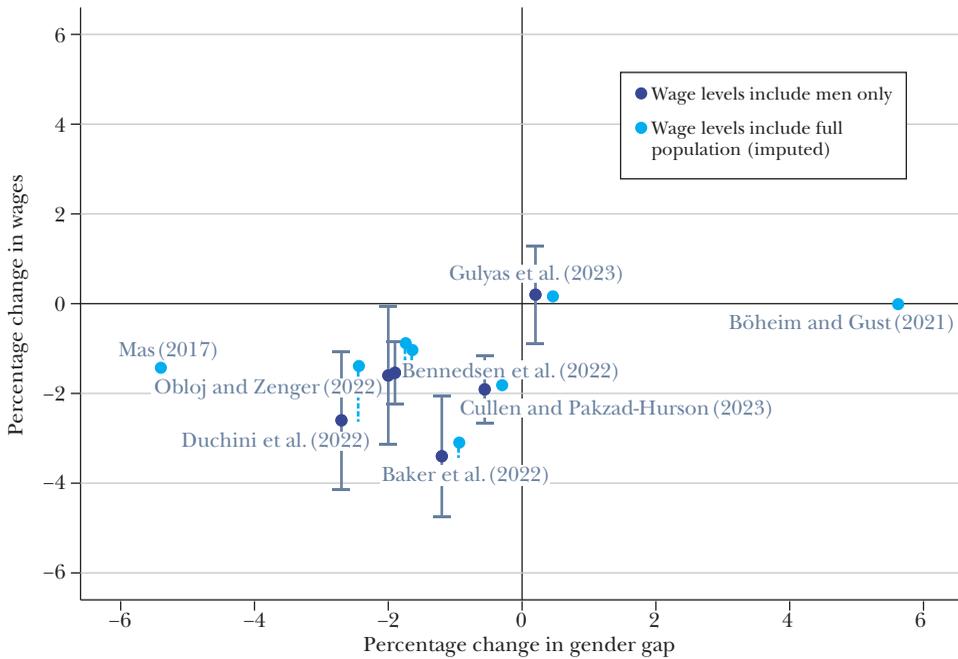
To understand the economics behind pay transparency, it is useful to categorize the types of pay transparency into three buckets: horizontal pay transparency, where coworkers at the same organization are informed of each other's pay (the Lilly Ledbetter case); vertical transparency, where transparency extends to different layers of seniority within an organization; and cross-firm transparency, where workers and/or employers have access to the pay information of competing firms and organizations.

Horizontal pay transparency gained traction politically because it could hold a bad actor accountable for "unfair" pay differences, as in the Lilly Ledbetter case. In specific situations where roles are clearly defined, this kind of pay transparency could be a starting point to identify discriminatory gaps in pay that are prohibited by the Equal Pay Act of 1963 and related laws. Research has shown that employers have responded to horizontal pay transparency by achieving equality through lower average pay overall. Figure 1 highlights this key trade-off that policymakers face when implementing horizontal pay transparency laws revealing coworkers pay gaps. Each data point represents the findings from the evaluation of a pay transparency mandate.¹ In the cases where transparency achieved greater pay equalization between men and women—those in the lower left quadrant of the graph—the reduction in pay gap was accompanied by an overall reduction in wages. Economic theory offers an explanation. Horizontal pay transparency between coworkers within a firm created spillovers between negotiations; specifically, a \$1 raise for one worker became more costly due to renegotiations with other workers who have the expectation of equal pay, causing employers to bargain more aggressively with each worker. Moreover, when wages were not equalized under horizontal transparency, research has shown that workers paid visibly less than some of their peers (which can be the majority of workers) felt disgruntled and exerted less effort.

In contrast, vertical pay transparency and cross-firm pay transparency, while less equipped to hold specific organizations accountable for discrimination, have proven capable of raising productivity and raising wages by reducing information frictions in the labor market. Vertical pay transparency increases workers' information about what they could earn if they were to be promoted. Because employees typically underestimate the steepness of financial rewards from promotion, vertical transparency raises expectations about potential earnings and has proven to boost effort and productivity in meritocratic environments. Cross-firm pay transparency, achieved through salary benchmarks like Glassdoor or salary ranges in job posts, informs prospective candidates about which employers pay more than others and leads applicants, especially those underpaid, to redirect their search toward higher paying firms and more favorable pay negotiations. Cross-firm pay transparency policies have also informed firms what their competitors are paying, increasing competition and putting upward pressure on wages. These pay transparency policies shine the light outward, away from coworkers under the same employer, toward vertical and cross-firm pay differences.

¹For details behind Figure 1, see the discussion later in this paper under the section heading *A Framework for Effects of Horizontal Pay*, which included Table 2 with a full list of the studies in this figure.

Figure 1
Effect of Pay Transparency on Wages, Existing Studies



Source: Each observation is a study of a pay transparency policy, with study details and results describe further in Table 2.

Note: The y-axis is the percentage change in wages, and the x-axis represents the percentage change in the gender wage gap. Dark blue dots represent the percentage change in wages for men only, with standard error bars, while light blue dots represent the percentage change in wages for all workers.

Information frictions in the labor market run deep. Not only are some workers in the dark about the pay of coworkers, but they are often in the dark about what pay they can expect in the future and the pay they could earn if they switch jobs or invest in training. Employers also face barriers to learning about market wages. The reasons for these information frictions are myriad—taboos around salary discussions, obstacles to credible communication, laws guarding against collusion, preferences for privacy, and strategic obfuscation. While many of the sources for information frictions are hard to overcome entirely, we do know that pay transparency policies make a difference in people’s perceptions about pay and, in turn, change behavior. The wage-setting games that employers engage in, and the career choices that workers make, respond to pay transparency tools and pay transparency policies.

The pay transparency lever is, in the end, stunningly cheap and powerful. However, this comes with a warning. Among the lessons learned in the study of pay transparency is that more information is not always better. Thus, we describe an open field for pay transparency studies to identify where greater and more equal access to information can improve economic outcomes. We begin this paper with a

review of the different kinds of pay transparency policies around the world. We then turn to the implications of horizontal pay transparency, revealing pay gaps between coworkers. Then, we discuss how alternative kinds of pay transparency, including vertical and cross-firm pay transparency, can affect labor market outcomes. We touch upon nonlabor market outcomes affected by pay transparency, including political preferences, and then conclude.

What Drives Variation in Wages across Workers?

To understand how pay transparency affects labor market outcomes, we must begin by understanding why people might be paid differently, if at all. In the United States, we observe significant variation in pay. Take for instance the sample of 600,000+ large and medium-sized firms that use Automatic Data Processing, Inc. (ADP) to process their payroll, allowing us to inspect differences in paychecks: for any two employees chosen at random within one of these companies, there is an average gap of 60 percent in their paychecks. If we take two people in the same position title (from a list of 10,000 standardized titles) without regard to their employer, the average gap is 46.7 percent. If we restrict it to two people who share the same position title at the same company, this gap is 10.7 percent.²

Some of the variation in compensation can come from differences in *how* people are compensated. In principle, total compensation includes benefits, bonuses, equity, in-kind transfers, and amenities, in addition to hourly or salary pay. However, most datasets lack the level of detail necessary to observe all components of compensation, and, as a consequence, research and policies are designed around what is observable. According to several in-depth studies of compensation, base pay (hourly wage or annual salary) empirically comprises more than 80 percent of financial compensation across all jobs and 100 percent of financial compensation for most jobs (Barkume 2004; Bryson and Freeman 2010; Gittleman and Pierce 2013). While we do not have standard measures of nonfinancial compensation, such as benefits and workplace amenities, we typically assume that base pay is the most important form of compensation for most employees.

Some of the differences in pay can be explained by differences in how people perform in their positions—some people will have more experience or exert more effort, and employers may reward and encourage high performance with higher pay. For simplicity, we will refer to these types of pay differences as “justified” as long as pay would be equal once we measured pay per unit of output. Some of the variation in pay comes from differences across employers. For example, some organizations are more productive than others, so individuals with similar skills are able to generate more revenue in some businesses than others—perhaps the equipment and training are higher quality—and the productive firms may want to attract

²Original calculations by the author, using ADP payroll data from 2022.

more workers by offering higher pay. Generally, the perception is that pay differences stemming from production differences across firms are also “justified” in the sense that performance-adjusted pay may still be equal.³ Finally, some of the differences in pay can be traced back to how workers and employers negotiate pay. Some workers may be less assertive and some employers may be more aggressive in their negotiations. Some employers may share more of their profits with workers, and some employers may express discriminatory views by making lower wage offers to some groups of their employees. In light of our discussion about pay transparency and the policy objective to achieve “fair pay,” we will refer to all pay differentials that cannot be explained by differential performance as “unjustified,” keeping in mind that a special class of unjustified pay pertains to discrimination against protected classes of workers. In the next section, we discuss how this categorization of pay differences is viewed in the eyes of policymakers.

Pay Transparency Policies around the World

While pay transparency policies pertain broadly to visibility across positions and firms, in practice the legal and political discussion has focused on pay differences between people working the same job, at a similar performance level, and under the same employer, narrowing in on so-called “unjustified” pay differences. In the United States, this focus on horizontal pay differences arose due to transparency policies designed to bring to light violations of the Equal Pay Act (EPA) of 1963, which prohibited wage discrimination based on sex, and related laws further prohibiting wage discrimination on the bases of race, color, national origin, religion, age, marital status, political affiliation, and disability. A violation requires pay differences to exist between workers in jobs that require “substantially equal skill, effort, and responsibility and be performed under similar working conditions within the same establishment.”

In the United States, the most popular form of pay transparency policy protects workers’ ability to discuss pay amongst themselves. Nationwide, the National Labor Relations Act of 1935 protects workers’ rights to discuss pay with their coworkers, but this legislation, designed to support collective bargaining, did not stipulate punishments for employers who retaliated against employees that disclosed or inquired about pay. Twenty states have since enacted laws that explicitly penalize employers for retaliating against any employee who discusses pay with their coworkers. Additionally, four states require that the employer either disclose pay range information or pay statistics about coworkers upon request, including information about benefits.

Table 1 describes a (probably partial) count of 18 types of pay transparency policies in 32 countries around the world, illustrating a popular aim of bringing to light pay discrimination through horizontal pay transparency. Canada’s Pay Equity Act uses prototypical language: “[T]he purpose of this Act is to achieve pay equity

³Of course, to the extent that some workers are simply lucky to secure jobs at more productive firms, we may question how “justified” these pay differences are.

Table 1

Partial List of Government Pay Transparency Mandates

Policy	Places implemented		Type
	Countries	Localities	
Reporting Gender Wage Gap Statistics by Occupational Group	Denmark (2006), Austria (2011), Belgium (2012), Lithuania (2017), Iceland (2018), Spain (2021), Canada (2020), Israel (2022)	NJ* (2018)	Horizontal
Transparent Pay Criteria for Job	Portugal, Peru (2017), Croatia		Horizontal
Ad Hoc Gender Pay Audits	Greece (2011), Turkey (2003), Ireland (2014), the Netherlands, Costa Rica		Horizontal
Right of Workers to Talk: Protected Disclosure & Inquiry	United States* (2014)	CA (2016), CO (2012), CT (2015), DE (2016), DC (2015), IL (2004), LA* (2013), ME (2009), MD (2016), MA (2018), MI, MN (2014), NE (2019), NV (2017), NH (2015), NJ (2013), NY (2016), OR (2016), VT (2013), WA (2018)	Horizontal
Wages or Wage Range Disclosure Employees Upon Request	Germany (2017), Chile	NV (2021), CT (2021), WA, RI (2023), CA (2023) for	Horizontal
Collective Bargaining Information Sharing	United States (1935)		Horizontal
Reporting Gender Wage Gap Statistic	Australia (2013), UK (2018), France (2018), Switzerland (2020), Italy (2021), Japan (2023)		Horizontal, Vertical
Public Salaries	Norway (1814), Sweden (1903), Finland (1800s), Iceland		Horizontal, Vertical, Cross-Firm
Government Employee Public Salaries	Estonia (2012)	CA (2010), CT (2015), DC (2014), IL (2021), LA (2023), MN (2011), NH (2009), NJ (2010), OR (2016), VA (2016), VT (2017), Córdoba, Argentina (2017)	Horizontal, Vertical, Cross-Firm
Expected Wages in Job Postings	Austria (2011), Slovakia (2018), Latvia (2019), Lithuania (2019)		Cross-Firm
Wage Ranges in Job Postings		Ontario, Canada (2019), CO (2021), CA (2023), WA (2023), and four US cities	Cross-Firm
Wage Ranges for Job Applicants Upon Request		CA (2018), MD (2020), WA, NV (2021), CT (2021), RI (2023), and two US cities	Cross-Firm
Public Labor Cost Index	Slovakia (2019)		Cross-Firm
Antitrust Safety Zone Permitting Salary Benchmarking	United States (1996)		Cross-Firm
Ban on Salary Discussion Among HR Professionals	United States (2016)		Cross-Firm
Prohibition of Salary History Bans		MI (2018), WI (2018)	Cross-Firm
Salary History Ban		AL (2019), CA (2018), CO (2021), CT (2019), DE (2017), (2019), IL (2019), ME (2019), MD (2020), MA (2018), NV (2021), NJ (2018), NY (2017), OR (2017), PR (2017), RI (2023), VT (2018), WA (2019), NC* (2019), PA* (2018), VA* (2019), Ontario, Canada (2019), and 20 US cities	Cross-Firm

Source: HR Dive (2022a); NLWC (2020); International Labour Organization (2022); Women's Bureau (2022); Frey (2021); European Commission (2017); HR Dive (2022b); Dreisbach (2014); Obama (2014); Perez-Truglia (2020); NJDOL (2018); City of Toledo (2019); City of Cincinnati (2019); Behrmann and Osborn (2018); DOJ and FTC (2016); Gobierno de la Provincia de Córdoba (2022); Johanson (2021); Green, Ceron, and Tanzi (2022); Midorikawa (2022); Nadworny (2022); Percivalle (2021); Valdez and Polar (2018); Shepherd (2022); Frimmel et al. (2022); Bennedsen, Larsen, and Wei (2022); Matthews (2019); Barry (2018); Gely and Bierman (2003); O'Donoghue (2023); Connecticut Office of the State Comptroller (2015); District of Columbia (2014); Illinois State Comptroller (2021); Minnesota Management and Budget (2011); State of New Hampshire (2009); State of New Jersey Transparency Center (2010); State of Oregon (2016); Commonwealth of Virginia (2016); and State of Vermont (2017).

Note: States or countries marked with * indicate the policy only applies to state employees or federal contractors, indicates laws passed but not yet effective.

through proactive means by redressing the systemic gender-based discrimination in the compensation practices” (Government of Canada 2018). Among the 27 countries that have implemented laws with the intent of addressing the gender pay gap, 24 are covered by policies that reveal pay gaps between coworkers. An additional three countries (Portugal, Croatia, and Peru) require organizations to make transparent the pay criteria for a job and the reason for any pay differences, and two countries (Germany and Chile) require that the employer disclose pay information about coworkers upon request. In Germany, for example, an employee at a firm with more than 200 employees can ask their employer for pay statistics about their occupation, broken down by gender. Each of these forms of transparency promote awareness of horizontal pay differences in the hopes of holding firms more accountable for justifying pay differences.

Other motivations for pay transparency policies include cultivating public trust and accountability. In Norway, Sweden, and Finland, income tax records are public. Norway’s tax authority explains they make the records public because “the opportunity to check the tax assessment process in general, as well as for individuals and groups of taxpayers, must be available in our society.”⁴ In Estonia, as well as in 18 US states, government employee salaries are made public, ostensibly to enhance government accountability. The United States also has national policies aimed at promoting competition between firms, including a ban on salary discussions among competing firms and state bans that protect the previous salary history of job candidates.

Enforcing pay transparency policies boils down to which forms of compensation can be tracked. While the objective of most policies is to enforce fair overall compensation, with language inclusive of benefits and transfers beyond base pay, in practice most enforcement plans hinge on limited data collected through the government agencies, such as the Equal Employment Opportunity Commission (EEOC) in the United States, or privately collected by employees and assessed by the court system. To the extent sources lack detailed information about benefits, equity, and nonpecuniary compensation, these components of compensation will be less tightly enforced. Similarly, research on the effectiveness of these policies also rests on what compensation is documented either in survey or administrative data. Hence, in what follows, our evidence on the impact of pay transparency focuses on what appears in payroll data and household or establishment surveys conducted by governments, and we will miss shifts toward hard-to-observe components of compensation.

Horizontal Pay Transparency: Revealing Coworker Pay Gaps

Horizontal pay transparency policies, designed to identify unjustified pay gaps and pin them to a particular employer, only have a chance of changing behavior if they are shifting perceptions about coworker pay.

⁴ The quotation is from the website of the Skatteetaten, the Norwegian Tax Administration, at <https://www.skatteetaten.no/en/forms/search-the-tax-lists/>.

On the one hand, we typically think that coworkers gossip with each other regularly and would talk about any topic that is important to them, including pay. On the other hand, we may doubt that pay is an easy topic of conversation. As the journalist Margaret Littman (2001, p. 39) put it: “You may know about your colleague’s sex life, your friend’s drinking problem, or what your neighbor really thinks of her mother-in-law. But you probably don’t know what they take home in each paycheck.” Indeed, surveys documenting beliefs about coworker salaries suggest significant misperceptions (Sun et al. 2021; Lawler 1965; Cullen and Perez-Truglia 2023).

The likely reasons that coworkers do not know about each other’s pay include workplace policies that promote pay secrecy and the disinclination of many workers to publicize their own pay. In a survey of full-time US workers in 2018, Sun, Rosenfeld, and Denice (2021) find that 35.4 percent of workers report pay discussion is discouraged in their workplace. Social scientists have pointed to social norms and taboos that curtail conversations about salaries, hypothesizing that such information touches on feelings about one’s personal worth to society (Edwards 2005; Lawler 1965; Trachtman 1999). Cullen and Perez-Truglia (2023) find quantitative support for social concerns around asking and sharing salary information: at the commercial bank that they study, 89 percent of respondents report they would feel uncomfortable if they had to ask a coworker about their salary, and 80 percent would forgo cash rewards to prevent their employer from sharing their individual earnings with coworkers. Willingness to disclose salary information appears to decline with age (Goldfarb and Tucker 2012) and relative standing, such that fears of resentment or competition may fuel the taboo more than status concerns about appearing well-off (Cullen and Perez-Truglia 2023).

Following pay transparency mandates, employees report greater access to information; for example, in US states that passed laws protecting workers’ rights to inquire and disclose pay between 2010 and 2018, the share of private sector workers reporting their employer prevents them from discussing pay fell from 33 percent to 10 percent during this window, while other states experienced a modest decline (Cullen and Pakzad-Hurson 2023; Sun, Rosenfeld, and Denice 2021). While this finding suggests that pay transparency policies shifted perceptions about what information sharing is permissible, more research is warranted to make a tight connection between specific pay transparency policies and knowledge about coworker pay.

In principle, pay transparency could also shift perceptions about one’s relative productivity. Suppose you interpret the revelation that your pay is lower than your coworker’s as a sign that your performance must also be lower. While we have limited direct evidence on this, in one setting, Cullen and Perez-Truglia (2022) test whether experimentally introducing pay transparency shifts employee perceptions about their performance rating relative to their peers in the same position and establishment. They find that employees started out with highly accurate perceptions about their relative performance ratings, and pay information had little effect on this. More studies are necessary before concluding this is broadly true.

A Framework for Effects of Horizontal Pay Transparency

Theoretically, how should pay transparency policies that reveal pay gaps between coworkers affect labor market outcomes? For some intuition, consider a two-part scenario: a worker learns that a colleague with the same job is earning significantly more than she is. She reasons that her employer must be willing to pay a higher wage for the work she is doing, or she sees the opportunity for courts to enforce equal pay. For either reason, she can seek to renegotiate her wage. The first part of the story is that information will lead workers to take action, demanding higher pay as Lily Ledbetter did. We have reason to believe this would happen with regularity: in a study using data from Hired.com, an online labor platform, Roussille (2021) showed that revealing median pay to job applicants led them to request at least the median pay in their applications. We also have evidence that when lesser-paid employees learn about unjustified pay gaps, they express discontentment about pay and reduce effort, cooperation, and work hours if those pay differences go unaddressed (Breza, Kaur, and Shamdasani 2018; Card et al. 2012; Cullen and Perez-Truglia 2022; Ockenfels, Sliwka, and Werner 2015), as predicted by Akerloff and Yellen (1990).

But there is a second part to the story. How will employers hire and set pay when they anticipate transparency? Consider wage negotiations under full pay transparency. A worker knows the wages of her peers, but also recognizes that her wage will be visible to her coworkers. The employer can credibly reject her demand for a raise by saying, “If I give you a higher salary, I’ll have to give everyone else a raise too, and I can’t afford that.” Under pay secrecy, the worker might have been skeptical of such a claim and bargained aggressively regardless, but due to transparency, the worker grasps the (true and costly) ramifications of asking for more than her coworkers make. This dynamic is akin to “stiffening the backbone” discussed in other contexts (Kreps and Wilson 1982; Milgrom and Weber 1982). At the same time, workers will tend to bargain less aggressively over pay when being hired, because they are less willing to risk rejection during the initial negotiation given the high likelihood of learning the prevailing wages for coworkers and renegotiating down the road. This dynamic is akin to “freeriding off others” motivation discussed by Kuhn and Gu (1998, 1999).

For these reasons, full horizontal pay transparency leads to an unintended side effect: if workers all get the same wage and cannot negotiate this wage upward, the firm effectively gains the power to set the wage. To maximize its profit, the firm acts like a monopsonist and sets a relatively low wage.⁵ In this setting, pay transparency increases the de facto bargaining power of the employer, becoming the enforcement

⁵It is worth noting the parallels between wage-setting under transparency and the literature on monopsony power. Under secrecy, employers may have leeway to pay the marginal hire more than other workers, effectively price discriminating, but under transparency, a raise for the marginal hire implies a raise for everyone who renegotiates with this information. The standard monopsony model in Alan Manning’s (2003) book *Monopsony in Motion: Imperfect Competition in Labor Markets* assumes employers must pay a single wage to homogenous workers, which leads to wage markdowns relative to the marginal product of workers. If firms could perfectly price discriminate, using the veil of pay secrecy, they would pay the marginal worker a wage equivalent to their marginal product. In this way, transparency may offer a microfoundation for monopsonistic wage-setting behavior.

mechanism for a low wage. For a formal model of a wage-setting game which conveys the economic forces present when transitioning from secrecy to transparency, and extensions to other bargaining environments, see Cullen and Pakzad-Hurson (2023).⁶

To get into the mindset of a company implementing transparency, consider Buffer, a company that chose to go fully transparent with its pay as a mid-sized startup (Gallani et al. 2017a, b). First, it considered posting the names of employees, including the chief executive officer, and exactly what they earned. Before doing so, it reviewed compensation closely and made sure that steps had been taken to mitigate any unjustified pay differences between employees. After posting, employees still had questions about pay gaps and whether they should be paid more equally. Thus, the company went even further, and posted a salary calculator, so that any employee or job candidate could enter their role, responsibilities, experience, and location into the salary calculation and see the corresponding paycheck. In essence, when the company shifted from pay secrecy to pay transparency, it also adopted a formulaic pay structure. The new system would make it costly to make an exception for an employee—in fact, the whole formula would have to change along with the pay of those affected.

To assess theoretical predictions of the full equilibrium effect of pay transparency, we turn to the evaluations of large-scale pay transparency policies from five different countries: the United States, Canada, the United Kingdom, Austria, and Denmark. Results have been published in eight independent studies that track wages around the time the policy is enacted.⁷ Because these policies have been focused largely on the goal of combatting pay discrimination, the studies have centered on whether these policies have reached their stated objective: closing wages gaps between men and women. Because our equilibrium model predicts that pay will be more equal, but lower, as a consequence of shifting bargaining power toward the firm, we pull from each paper information about both the wage gap and the wage levels. We report study details and results in Table 2.⁸ In Figure 1 (presented

⁶In the context of the Cullen and Pakzad-Hurson (2023) model, under full pay secrecy, workers make a single take-it-or-leave-it offer. This maximizes expected worker surplus and expected wages (Williams 1987). Under full pay transparency, the reverse happens, the employer sets a posted price, akin to an employer take-it-or-leave-it offer. And, consequently, the employer maximizes their surplus. Increasing transparency shifts bargaining power toward the employer: the expected employer profit is strictly increasing in level of transparency, and expected wages are strictly decreasing with an increase in transparency.

⁷We select studies using the procedure from Cullen and Pakzad-Hurson (2023). First, the policy studied must be referred to as a “pay transparency” policy or a related term. Second, it must study the policy in the context of a real-world labor market. Third, it must assess the effect of the policy on the wages of all employees in that labor market.

⁸Five studies (in three countries) evaluate mandates to publish wage statistics by gender (Bennedsen et al. 2022; Böheim and Gust 2021; Duchini et al. 2022; Gulyas, Seitz, and Sinha 2023). UK law requires firm-level statistics be made public, while Austria and Denmark require averages by occupational group be disclosed to employees. Three studies evaluate policies that mandate posting of individual salaries in university or municipal contexts (Baker et al 2022; Mas 2016; Obloj and Zenger 2020). The final study in the table concerns “Right of Workers to Talk” laws, prohibiting US employers in states that have passed such legislation from punishing workers who internally discuss or inquire about salaries (Cullen and Pakzad-Hurson 2023).

Table 2
Eight Studies of Horizontal Pay Transparency Laws

<i>Study</i>	<i>Baker et al.</i> (2022)	<i>Bennedsen et al.</i> (2020)	<i>Böheim and Gust</i> (2021)	<i>Duchini et al.</i> (2022)
Setting	Canadian universities	Danish private sector	Austrian private sector	UK private sector
Policy	Posting individual salaries	Disclosure of relative earnings by gender	Disclosure of relative earnings by gender	Disclosure of relative earnings by gender
Men's wage effect (standard error)	-0.034 (0.007)	-0.015 (0.0073)	0.005	-0.026 (0.008)
Women's wage effect (standard error)	-0.022 (0.006)	0.0036 (0.0043)	-0.008	0.003 (0.014)
Share men	0.725	0.7	0.42	0.53
W:M pay ratio (pre-policy)	0.89	0.84	0.78	0.82
Imputed overall wage effect	-0.031	-0.010	-0.000	-0.014
<i>Study</i>	<i>Gulyas, Seitz, and Sinha</i> (2023)	<i>Mas</i> (2016)	<i>Obloj and Zenger</i> (2022)	<i>Cullen and Pakzad-Hurson</i> (2023)
Setting	Austrian private sector	CA public sector	US universities	13 US states
Policy	Disclosure of relative earnings by gender	Posting individual salaries	Posting individual salaries	Right of workers to talk
Men's wage effect (standard error)	0.002 (0.004)	-0.014 (0.017)	-0.016 (0.008)	-0.019 (0.007)
Women's wage effect (standard error)	0.001 (0.004)	-0.07 (0.021)	0.005 (0.004)	-0.016 (0.005)
Share men	0.58	0.99	0.614	0.58
W:M pay ratio (pre-policy)	0.75	2.80	0.93	0.74
Imputed overall wage effect	0.002	-0.014	-0.009	-0.018

Source: Baker et al. (2022): Numbers drawn from Table 4 Col. 4, Table 2. Bennedsen et al. (2020): Numbers drawn from Table 3 Col. 7, Table 1. Duchini et al. (2022): Numbers drawn from Table 3 Col. 1, Table 2. Böheim and Gust (2021): Numbers drawn from Table 1, Table 4, Panel D. Row 2. Gulyas, Seitz, and Sinha (2023): Numbers drawn from Table 1, Table B2 Col. 2, Footnote 6. Mas (2016): Numbers drawn from Table 2 Col. 5 Row 3, Table 3 Col. 2 Row 3. Additional numbers drawn from the California municipal pay website at <https://publicpay.ca.gov/Reports> and Reese (2019). Obloj and Zenger (2022): Numbers drawn from Table 1 Col. 6, page 5. Cullen and Pakzad-Hurson (2023): Numbers drawn from Table C.1, Figure D.5.

earlier), and we plot the percent change in the gender wage gap (along the x -axis) against the percent change in overall wage levels (along the y -axis) for each study. Following Cullen and Pakzad-Hurson (2023), we include two data points from each study when available. The darker points capture the effect size directly reported in the paper and refers to the effect of pay transparency on men's wages along with the 95 percent confidence interval. The lighter points reflect the imputed estimate of transparency's effect on the overall population.⁹

Why did some pay transparency policies have no effect at all on wages? Our bargaining theory offers one explanation. Workers must start out with individual bargaining power for pay transparency to create spillovers between individual negotiations. In many labor markets, workers bargain under a collective agreement (Bhuller et al. 2022). Cullen and Pakzad-Hurson (2023) document that in environments where individuals have a high degree of bargaining power to begin with, namely in occupations with low unionization rates, pay transparency mandates were followed by significant wage reductions, while highly unionized occupations experienced negligible wage changes.

Our bargaining theory predicts lower and more equal pay when individual negotiations are newly anchored to one another. Could it also be that employers adjust pay in fear of demoralizing employees who observe unjustified pay gaps? In their study of Denmark's requirement that firms with more than 35 employees internally report wage statistics by gender and occupation, Bennedsen et al. (2020) find that average wages per employee in firms just above the policy size threshold fell by 2.8 percent relative to those just below the policy size threshold, and one year later, productivity (measured by average sales per employee) was 2.7 percent lower above the policy threshold. This study is our best evidence to date on the presence of a productivity response to inequality that may persist in equilibrium in spite of rebargaining. This fall in productivity is consistent with the demotivating effect of learning one earns less than their peers; it is also consistent with a reaction to slower wage growth overall. More research with granular measures of output is necessary to disentangle the two mechanisms.

Alternative Innovative Designs for Pay Transparency

Overall, evidence on the effects of revealing wage gaps between coworkers has taught us about two unintended consequences when pay transparency is horizontal. First, the information spillovers between the negotiations of employees under the same employer can shift the de facto bargaining power toward the employer, lowering wages. Second, peer coworkers compare themselves to each other. In cases where employers fail to equalize wages, lesser-paid employees can experience lower morale and lower effort. In this section, we will look at how vertical and cross-firm

⁹These data points for Mas (2017) and Böheim and Gust (2021) are omitted because wage results for men are not reported. Further details are in the online Appendix.

pay transparency policies affect labor market outcomes. While negotiation spillovers and interpersonal comparisons might still be at play, these effects are muted. These alternative pay transparency policies operate by educating workers about the full range of opportunities to earn higher wages by applying to higher paying firms and reaching promotion. Cross-firm pay transparency policies also educate employers about market wages. Many of the pay differences revealed would be considered “justified” pay gaps.

To see the potential of these alternative pay transparency designs, we will walk through key moments where workers and employers form beliefs about the pay being offered in the marketplace and use this information to guide their decisions. In turn, it will elucidate where more information can potentially shift beliefs and behavior.

On the supply side of the labor market, let a worker’s earnings be a function of several choices: human capital investments, the intensity of job search, the effectiveness of their negotiations, and their effort on the job. Each of these choices are made under uncertainty. The pay of others can shape the beliefs about expected returns to each of these actions, and in turn influence their choices. For example, information about the value of a promotion might come from water cooler conversations about what others have earned, which in turn can influence motivation and effort. Job advertisements might lack pay information or list a wide range, so it may be the pay of a former coworker now at this firm that anchors pay expectations and determines whether to apply for such a job. Similarly, the pay of former graduates may be the best available information on the returns to a particular education or training program, and encourage or dissuade enrollment for that reason.

On the demand side of the labor market, employers make wage-setting and hiring decisions as a function of what they believe their competitors are offering, as well as what they believe their employees know about these outside offers. *Prima facie* evidence that employers face uncertainty about market pay is the prevalence of consulting firms that offer salary benchmarking services, including Abbott, Langer, and Associates; Korn Ferry; Mercer; Radford; and Willis Towers Watson.

Some aspects of misperceptions and uncertainty about pay have long been embedded in our canonical economic models of the labor market. Sixty years ago, Stigler (1962) formalized the idea that job seekers face limited information about the full set of outside offers available to them. The subsequent modern search and matching models retain this feature (Diamond 1982; Mortensen 1982, 2005; Pissarides 1985; Postel-Vinay and Robin 2002). This limited information that workers have about the pay at alternative employment opportunities can lead to wage differences between similar workers who face different perceptions of their opportunities. However, many forms of misperceptions and uncertainty about pay are not captured by our go-to models of the labor market. For example, economists rarely consider misperceptions on the employer side (Cullen, Li, and Perez-Truglia 2022).

Recent empirical work has made headway by documenting pay misperceptions and uncertainty with survey tools. With the aid of “information experiments”—in

which treatment groups and a control group are exposed to different information before making a decision—researchers have demonstrated how pay information shifts beliefs and behavior. In the following section, we describe documented misperceptions and their estimated effects, and combine these empirical facts with theoretical frameworks. We highlight instances further pay transparency studies could illuminate consequential information frictions and policy solutions.

Transparency in Returns to On-the-Job Effort: Vertical Pay Transparency

A rich literature on optimal contracts indicates that incentives should rise steeply over one's career, precisely to encourage employees to work hard and stick with their employer (for an overview of the literature, see Lazear 2018; Dewatripont, Jewitt, and Tirole 1999; Gibbons and Waldman 1999b). What are people's actual perceptions of how steeply these incentives rise, and thus, how might pay transparency influence perception and behavior? In a classic study, Lawler (1965) surveyed 326 managers from four privately owned US companies and found respondents underestimated the salaries of those in higher positions. This pattern of underestimating vertical inequality has been replicated in other settings. For example, Cullen and Perez-Truglia (2022) carried out a guessing game at a commercial bank, where employees could earn a sizable financial prize if they guessed the average salary of their boss's position within ± 5 percent of the truth. Employees underestimated the truth on average by 14.1 percent.

When people systematically underestimate what their superiors earn, the news content of pay transparency inflates perceptions about overall inequality and positively impacts expected future earnings in environments where workers are upwardly mobile. Cullen and Perez-Truglia (2022) find that, with every 10 percent boost in perceived managers' salary, subjects projected that their own earnings would be 1.7 percent higher five years down the road. News of larger pay gaps with higher-ups did not generate resentment, though in theory it might have. While employees responded negatively to learning their peers earned more than expected, these social concerns did not extend to comparisons with higher-ups. Linking these survey data with administrative data on employee performance revealed that employees also increased their sales revenue by 1.1 percent, they sent 1.3 percent more emails, and worked 1.5 percent longer hours for each 10 percent upward shift in perception about managerial pay.¹⁰ In the context of public sector workers in Sierra Leone, Deserrano, Kastrau, and León-Ciliotta (2021) showed the effect of vertical transparency differed depending on whether the environment was perceived as meritocratic. In meritocratic segments of the Ministry of Health, perceptions of steeper salary raises upon promotion increased effort, measured by the number of home health visits. In nonmeritocratic segments, perceptions of steeper pay raises lowered morale and reduced home health visits because learning about higher superior pay did not raise own earnings expectations.

¹⁰In a similar vein, Flynn (2022) finds that National Hockey League players shifted their efforts towards more highly compensated strategies like offense, following pay transparency.

What does theory predict happens to wages when vertical pay gaps are made transparent? Like horizontal pay transparency, vertical pay transparency creates a link between the negotiations of employees bargaining with a single employer. On the one hand, employers will recognize that a raise to someone's boss in turn inflates what their employees will ask for upon promotion, which provides an incentive for employers to bargain more aggressively. On the other hand, the motivating effects of revealing a steeper-than-expected reward structure in the organization could very well dominate the effect of shifting bargaining power, and the net effect on wages could be positive or neutral.

Some pay transparency policies, existing or under consideration, can be considered vertical pay transparency. Most notably, a 2020 UK policy requires UK-listed companies with more than 250 employees to report the ratio of pay between the median, 25th percentile, and 75th percentile employees and the chief executive officer (Clark 2019). In the United States, the Securities and Exchange Commission enacted in 2017 a regulation requiring reporting of the ratio of the median worker to the pay of the chief executive officer (US Securities and Exchange Commission 2015). Of course, these ratios might not help workers to learn about potential gains in the next step of one's own personal earnings trajectory in any precise way, though they could still be positive news about expected pay. Another set of policies that reveal vertical pay are internal pay grids, which have been implemented in many public sector settings world-wide (examples in Table 1) and allow employees to observe the earnings trajectory within their organization. Currently, we lack direct evidence on the causal effects of implementing these policies.

Transparency in Returns to Job Search

Pay is only one feature of the job, but it may be an especially influential one. Belot, Kircher, and Muller (2019) show that the wage information in job postings affects where people apply. As noted earlier, economists have long observed that job search is a process in which workers can only reasonably collect information about a tiny fraction of suitable jobs. Using data on online US job market listings from Burning Glass, Arnold, Quach, and Taska (2022) find that only 30–40 percent of job postings have information about the pay of the job directly listed. According to Hall and Krueger (2012), only 23 percent of recent hires had a clear expectation about how much the job paid at the time they first interviewed. Without upfront pay information, do workers misdirect their applications? What do they assume about pay in the absence of explicit information from the employer?

An empirical regularity across a range of settings is that workers anchor on their own wage (or most recent wage) when forming beliefs about the pay of job opportunities, whether it be internal promotion opportunities, like the employees from a multibillion-dollar corporation in Southeast Asia studied in Cullen and Perez-Truglia (2022), or the potential outside wage offers reported by a representative sample of workers in Denmark (Hvidberg, Kreiner, and Stantcheva 2020). One implication is that low-wage workers, in particular, underestimate the pay associated with job opportunities. Jäger et al. (2021) showed this by sampling from the

German workforce and asking employees hypothetical questions about the wage they would receive if they left their current job and accepted another job within three months. When these subjective beliefs about wages were compared with the actual wages of observationally identical coworkers who switched employers, they proved to be systematically lower than reality among low-earners and higher than reality among high-earners. The beliefs of the unemployed are an exception to this pattern: their job prospects can dip below their previous wages, and hence anchoring on previous wages can lead to over-optimism (for example, as argued in Arni 2013; Krueger and Mueller 2016; Mueller, Spinnewijn, and Topa 2021; Spinnewijn 2015).

Theoretically, more information about the pay at various job opportunities would lead candidates to direct their applications toward higher-paying firms, all else equal. Relatively low earners would be the most motivated by the news to renegotiate their pay or apply elsewhere. Such increase in competition generated by directed job search places upward pressure on wages, and pushes toward pay compression as underpaid workers relocate. (Employers may also learn more about the pay at competing firms, a channel we discuss in the next subsection.)

Both observational and experimental studies capture the positive impact that cross-firm pay transparency can have for employees and job seekers. Using Danish administrative employer-employee data, Caldwell and Harmon (2019) offer evidence that news about other job offers arrives through the networks of former coworkers, and those informed are able to use the information to negotiate raises and switch to higher paying jobs. In a natural experiment on Hired.com, a job-matching platform geared toward engineers, Roussille (2021) showed that when women were informed about the median offers that other candidates received *across* employers, the information resulted in higher offer salaries for women on the platform by 2.6 percent, fully closing the gender gap.

New laws requiring salary information to be included explicitly in the advertisement for a job have taken effect in a few US states and cities (Colorado, New York City, Washington, and California) as well as a few European countries (Austria, Slovakia, Latvia, and Lithuania). The implementation of these policies may allow researchers to study what happens in equilibrium when cross-firm pay transparency policies are mandated broadly. In unpublished surveys results, along with Roussille and Jaeger, we interviewed over 2,000 employers using ZipRecruiter, a nation-wide US job posting platform, and asked their expectations about the law's full impact. Employers generally expect wages to either rise (33.1 percent) or stay the same (65.1 percent). Only 1.7 percent expect wages to fall. On average, they expect wages to rise 2.4 percent. The majority (56.5 percent) also expect salary ranges to increase the quality of their applicants. While close to 50 percent of employers believe turnover will not change, 35.0 percent believe their higher-performing employees will stay longer and 42.7 percent expect higher churn among their lower-performing employees.

Evidence from other settings on the effects of these laws suggests that these expectations of US employers may be on target. Slovakia's cross-firm pay

transparency law that went into effect on May 1, 2018, required firms nationwide to include an expected salary in all job advertisements. Skoda (2022) tracked job applications and final wages in Slovakia before and after the law. Before the passage of the law, the share of job postings with salary information ranged from 10 percent in some job titles to 60 percent in others. After the reform, nearly all job titles listed expected pay in the job advertisement. Consequentially, job applicants in Slovakia applied to a more diverse set of opportunities, spanning a greater number of sectors and wider array of job titles. The earnings of those hired after the reform were, on average, 3 percent higher than the wages of those hired before the reform. A similar law in Austria required postings to include a minimum wage offer (Frimmel et al. 2022), and similar law in Colorado required wage ranges in job postings (Arnold, Quach, and Taska 2022); both found an increase in wages posted after the reform, consistent with effects documented in Slovakia. Researchers are now awaiting data on the effects in New York City, California, and Washington, which enacted similar legislation in late 2022 and early 2023.

Employer-Side Pay Transparency

Most economic models suggest workers would be forthcoming about their outside options in order to secure higher pay from their current employer, but empirically, such renegotiations are far from guaranteed. Dube, Naidu, and Reich (2022) offer job opportunities to Walmart workers and find that higher-paid outside offers prompted quits to rise faster than renegotiations. Anecdotally, employers think about the possibility of workers getting poached when setting initial salaries. In their human resources textbook, Berger and Berger (2008, p. 125) write, “No organization wants to waste their financial resources by paying too high relative to the market; and those who pay too low risk unwanted turnover from employees looking for a better deal elsewhere”—a view that suggests employers may not expect a chance to match the outside offer if and when it arrives. Based on their survey of 1,350 human resources professionals who report setting pay for new and current employees, Cullen, Li, Perez-Truglia (2022) find that 81 percent report limited or no access to outside offer information of their employees, and 20 percent report not even having easy access to their own internal pay records, which some organizations consider sufficiently sensitive to restrict managers’ access.

Firms also face legal barriers to collecting and retaining some pay information. For example, firms are legally prohibited from discussing salaries directly with their competitors, a law intended to prevent collusion (DOJ and FTC 2016). In addition, some speculate that firms face constraints storing data that can be used against them in discrimination lawsuits (Adler 2022).

How would more information about competitor pay, or outside options of job candidates, affect wages and hiring? Using tools from auction theory, one can generalize competitive labor market models so that each firm is uncertain about the distribution of market wages, even in equilibrium. In such models, benchmarks that reveal the wage distribution lead to compression. However, under

standard technical conditions, such benchmarks raise the mean wage by sharpening competition between firms. This result proceeds from the linkage principle (Milgrom and Weber 1982); the information revealed by a benchmark more strongly links each firm's payment to the aggregate market conditions, which erodes that firm's information rents.

When firms do not have perfect information about the value of a candidate, they may infer additional information through the bids of other firms. In other words, they may learn more about what a candidate could produce by seeing other firm wage offers. In this case, a "common values" auction model (that is, an auction in which the item will have the same value to all bidders, but bidders have different information about that value) can shed light on what will happen in equilibrium (Krishna 2009). Students of this literature will be familiar with the "winner's curse": if firms all bid their (noisy) signal about the value of the candidate, the winning bid is likely to be one of the parties with the highest positive measurement error. For fear of being that party, and thus falling victim to the winners' curse, firms will shade down their bids. When more information about competing bids becomes public knowledge, concerns about a winners' curse subside and firms feel less need to shade down their bids. Again, bids and final wages rise in the presence of greater pay transparency.

Cross-firm pay transparency policies typically provide pay information to prospective employees and also to competing firms. In their survey of employers about US state legislation mandating employers include salary ranges in their job postings, Cullen, Jaeger, and Roussille found that over half of employers expressed interest in the salary range information included in job advertisements similar to theirs, and 33.6 percent reported that they will use this information when setting their own salary ranges.¹¹

Finding a persuasive empirical strategy to disentangle the impact that pay information has through firm beliefs and employee beliefs poses challenges, especially in contexts where the information is made simultaneously available to both sides of the market. In one setting studied, however, market wage data was made only available to employers. Cullen, Li, and Perez-Truglia (2022) study the roll-out of a proprietary salary benchmark that allowed clients of the largest payroll processing firm to have access to detailed salary information, based on their full database of payroll for 650,000 US employers. For employers who gained access to this high-quality salary benchmark, pay-setting converged toward the median pay in the marketplace, in this way reducing wage inequality (measured as the absolute dispersion from the median) in new hire salaries by over 25 percent. Among low-skilled positions (capturing approximately half of new hires) where the salary data was likely particularly informative, dispersion fell by 40 percent. Wage levels rose between 1–2 percent overall, and wages for new hires in lower-skill groups rose by

¹¹ The results refer to an unpublished survey hosted on ZipRecruiter, available to employers at the point they post a job advertisement on this nation-wide internet job board: 1,630 employer responses were collected.

over 6 percent along with corresponding boosts in retention (16 percent higher among low-skilled positions). Overall, the evidence suggests information about market pay affected firms' beliefs and behavior, reducing inequality in pay within a position title, raising wages among low-skilled jobs, and improving efficiency through longer-lasting job matches.

Much more research on this topic is necessary to comprehend the extent of information frictions on the firm side more fully and to design policies to improve market efficiency. For example, are firms only learning about the outside options of workers, or are they also learning about the value an employee can bring to their firm? As many of the policies that have potential to improve directed worker search will also affect employer beliefs about competitor pricing, what is the interaction of these two channels?

Transparency in Returns to Education

Policies related to pay transparency might also seek to affect the decisions that workers or employers make well before a salary negotiation. For example, do young people have an accurate perception of how their education choices are related to earnings in the short and long run? How might pay transparency affect these perceptions and choices?

In an early attempt to address this question, Betts (1996) surveyed undergraduates at the University of California at San Diego and asked them to guess the average national earnings for students, both for recent graduates and also later in their lives. While the questions were about national averages, not expectations about personal returns to education (the relevant theoretical object), answers could be compared to government earnings statistics to measure accuracy of beliefs. The students significantly underestimated the slope of the wage profile, but the error around the average earnings of recent college graduates was modest (5.8 percent was the mean percentage error). Knowledge was not equal across types of students: students from poorer families exhibited much larger errors estimating the salaries of college graduates.

More recent studies have also suggested that additional pay transparency related to education choices can alter aspirations. In a representative sample of US heads of households, Bleemer and Zafar (2018) find that information about returns to schooling increased intention to attend college by 0.2 standard deviations over baseline expectations among a representative US sample of households. They also document that disadvantaged households have bigger errors in their perceptions of returns to a college degree, and that giving the information on returns to education helps close the socioeconomic gap in schooling expectations. Similarly, Wiswall and Zafar (2014) show information to students at New York University about the earnings and labor supply by degree and major. The students updated beliefs about their own earnings expectations when shown information about earnings in the population. Moreover, the average odds of shifting to the two-highest paying majors—economics/business and engineering/computer science—relative to the humanities shifted by 46 percentage points and 72 percentage points, respectively.

In a parallel study of students conducted in a low-income country, the Dominican Republic, Jensen (2010) noted that over 70 percent reported relying on the people they knew in their community for information about earnings—in part, presumably, because they lacked other sources of information on pay. Eighth-graders facing the decision to enter secondary school systematically underestimated the returns to a secondary education, undershooting by 14 percent on average. When eighth-grade boys received information about what a typical 30 or 40 year old earns on average as a function of education level, six months later these participants could recollect this information, and over the next four years, they ended up completing more years of education (between 0.20 and 0.35 more years).

The current pay transparency mandates, as captured earlier in Table 1, are not tailored to shed light on returns to education. Moreover, publicizing the returns to education has not been a primary motivation for pay transparency policies. The US policy most related to this goal is a website designed and maintained by researchers at the US Census Bureau (2020), the Post-Secondary Employment Outcomes (PSEO) data, where students can look up information about the salaries negotiated by recent graduates as a function of their college and major. One potential shortcoming of making pay information available through government websites is that search behavior is imperfect, and people with lower literacy have proven less likely to find relevant information (Fuster et al. 2022). As is the case with most forms of pay transparency, the information is “within reach” with only a few conversations, but mandates and clever policies are required to make the information readily accessible at the point decisions are made.

Nonlabor Market Outcomes Affected by Pay Transparency: Tax Delinquency, Happiness, and Preferences for Redistribution

Pay transparency policies might affect outcomes outside the labor market, including tax compliance, happiness, and preferences for redistribution. Some of the literature draws directly on pay transparency legislation; some investigates the effects of when information about pay or income is provided by the researcher in a field experiment.

In a few countries, pay transparency seeks to curb tax delinquency by making income public information. For example, Norway, Finland, Sweden, and Iceland publicize individual incomes “to check the tax assessment process in general” (in the words of the Skatteetaten, the Norwegian tax authority). Bø, Slemrod, and Thoresen (2015) look at what happened to tax compliance in Norway around the time that the tax records became searchable online in 2001 and find that business owners reported higher income, rising by about 3 percent on average.

Moreover, publicizing tax returns and income across the economy had the unintended side effect of correcting misperceptions about the income distribution. A number of studies have documented misperceptions about pay by asking questions about the overall income distribution. In much the way workers anchor on their

own wage when asked about the pay of peers, respondents anchor to their own local environment when asked about inequality across the economy. Because inequality in one's local environment is more muted on average than across the economy, people systematically underestimate economy-wide inequality. Additional information about income or pay shifts perceptions on average toward greater inequality (Hauser and Norton 2017; Hvidberg, Kreiner, and Stantcheva 2020; Kuziemko et al. 2015; Norton and Ariely 2011).

These more accurate perceptions of the distribution of income and pay may have implications for happiness and for preferences over redistribution. The information contained in pay transparency about relative standing could be a significant driver of overall well-being, given that happiness hinges to some comparison to others. Indeed, Luttmer (2005) used self-reported happiness data, along with individual and local-level income from US data on Public Use Microdata Areas, and found that one's happiness declined as one's neighbor's income rose, holding own income constant. Perez-Truglia (2020) showed pay transparency increased the happiness gap between the rich and poor: in Norway, when tax records became highly visible online, people learned about their relative positions: those with lower incomes experienced a drop in happiness, while those with high incomes experienced a symmetric increase in happiness.

Several studies in which researchers provided accurate information about pay or income suggest that demand for redistribution could also respond to pay transparency. In a study in Buenos Aires, Argentina, with 1,100 representative households, Cruces, Perez-Truglia, and Tetaz (2013) exposed participants to accurate information about their own position in the income distribution and found that people who mistakenly believed they were middle class reacted by increasing their support for government welfare. Similarly, Kuziemko et al. (2015) randomized information treatments to a large internet panel of Americans, conveying to people the true US income distribution as well as growth in inequality since 1980. Indeed, the truth shifted people's beliefs about inequality and led them to express concerns about inequality. However, the authors concluded that the new information only increased demand for redistribution when subjects viewed government as effective at combating inequality. For those that believed alternative methods were more effective solutions (for example, hard work), learning the true extent of inequality did little to change demand for redistribution. In the context of a financial institution in Southeast Asia, Cullen and Perez-Truglia (2022) find that, when employees learn their peers earn more than they were expecting, they report higher dissatisfaction with the extent of inequality at the firm.

Conclusion

Horizontal pay transparency policies that reveal pay gaps between coworkers doing similar work at the same firm characterize many pay transparency policies that have been put in place over the past two decades, designed to bring to light

unjustified pay gaps inside an organization. Recent research has revealed that these policies reduce pay gaps but also have unintended spillovers between worker negotiations that lower worker bargaining power and wages. In contrast, vertical and cross-firm pay transparency policies that ameliorate information frictions in the labor market more broadly have shown potential to improve motivation and talent allocation and sharpen competition, and, in so doing, raise wages, productivity, and equity. These alternative pay transparency policies are not designed to draw attention to employers who pay different wages to similar workers, but instead to educate workers about the full range of opportunities to earn higher wages when they make decisions about what type of work to pursue, how hard to work, and for whom they work. Pay transparency policies can also educate employers about market wages, with procompetitive effects.

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References

- Adler, Laura.** 2022. “From the Job’s Worth to the Person’s Price: Pay-Setting, Gender Inequality, and the Changing Understanding of Fair Play.” Unpublished.
- Akerlof, George A., and Janet L. Yellen.** 1990. “The Fair Wage-Effort Hypothesis and Unemployment.” *Quarterly Journal of Economics* 105 (2): 255–83.
- Arni, Patrick.** 2013. “What’s in the Blackbox? The Effect of Labor Market Policy on Search Behavior and Beliefs: A Field Experiment.” Unpublished.
- Arnold, David, Simon Quach, and Bledi Taska.** 2022. “The Impact of Pay Transparency in Job Postings on the Labor Market.” Unpublished.
- Baker, Michael, Yosh Halberstam, Kory Kroft, Alexandre Mas, and Derek Messacar.** 2022. “Pay Transparency and the Gender Gap.” *American Economic Journal: Applied Economics* 15 (2): 157–83.
- Barkume, Anthony J.** 2004. “Using Incentive Pay and Providing Pay Supplements in U.S. Job Markets.” *Industrial Relations: A Journal of Economy and Society* 43 (3): 618–33.
- Barry, Ellen.** 2018. “Happy ‘National Jealousy Day’! Finland Bares Its Citizens’ Taxes.” *New York Times*, November 1. <https://www.nytimes.com/2018/11/01/world/europe/finland-national-jealousy-day.html>.
- Behrmann, Anna, and Kathy Osborn.** 2018. “In Effort to Increase Employees’ Bargaining Power, U.S. Senators Petition Federal Antitrust Agencies to Revisit Benchmarking Guidelines.” *JD Supra*, July 13. <https://www.jdsupra.com/legalnews/in-effort-to-increase-employees-26757>.
- Belot, Michéle, Philipp Kircher, and Paul Muller.** 2019. “Providing Advice to Jobseekers at Low Cost: An Experimental Study on Online Advice.” *Review of Economic Studies* 86 (4): 1411–47.
- Bennedsen, Morten, Birthe Larsen, and Jiayi Wei.** 2022. “Wage Transparency and the Gender Pay Gap: A Survey.” Copenhagen Business School Department of Economics Working Paper 17-2022.
- Bennedsen, Morten, Elena Simintzi, Margarita Tsoutsoura, and Daniel Wolfenzon.** 2022. “Do Firms Respond to Gender Pay Gap Transparency?” *Journal of Finance* 77 (4): 2051–91.

- Berger, Lance A., and Dorothy R. Berger.** 2008. *The Compensation Handbook*. New York: McGraw-Hill.
- Betts, Julian R.** 1996. "What Do Students Know about Wages? Evidence from a Survey of Undergraduates." *Journal of Human Resources* 31 (1): 27–56.
- Bhuller, Manudeep, Karl Ove Moene, Magne Mogstad, and Ola L. Vestad.** 2022. "Facts and Fantasies about Wage Setting and Collective Bargaining." *Journal of Economic Perspectives* 36 (4): 29–52.
- Bleemer, Zachary, and Basit Zafar.** 2018. "Intended College Attendance: Evidence from an Experiment on College Returns and Costs." *Journal of Public Economics* 157: 184–211.
- Bø, Erlend E., Joel Slemrod, and Thor O. Thoresen.** 2015. "Taxes on the Internet: Deterrence Effects of Public Disclosure." *American Economic Journal: Economic Policy* 7 (1): 36–62.
- Böheim, René and Sarah Gust.** 2021. "The Austrian Pay Transparency Law and the Gender Wage Gap." IZA Discussion Paper 14206.
- Breza, Emily, Supreet Kaur, and Yogita Shamdasani.** 2018. "The Morale Effects of Pay Inequality." *Quarterly Journal of Economics* 133 (2): 611–63.
- Brütt, Katharina, and Huaiping Yuan.** 2022. "Pitfalls of Pay Transparency: Evidence from the Lab and the Field." Tinbergen Institute Discussion Paper TI 2022-055/I.
- Bryson, Alex, and Richard Freeman.** 2010. "How Does Shared Capitalism Affect Economic Performance in the United Kingdom?" In *Shared Capitalism at Work: Employee Ownership, Profit and Gain Sharing, and Broad-based Stock Options*, edited by Douglas L. Kruse, Richard B. Freeman, and Joseph R Blasi. Chicago: University of Chicago Press.
- Caldwell, Sydnee, and Nikolaj Harmon.** 2019. "Outside Options, Bargaining, and Wages: Evidence from Coworker Networks." Unpublished.
- Card, David, Alexandre Mas, Enrico Moretti, and Emmanuel Saez.** 2012. "Inequality at Work: The Effect of Peer Salaries on Job Satisfaction." *American Economic Review* 102 (6): 2981–3003.
- City of Cincinnati.** 2019. An Ordinance No. 83. <https://www.cincinnati-oh.gov/cityofcincinnati/equity-in-cincinnati/city-of-cincinnati-s-salary-equity-ordinance/>.
- City of Toledo.** 2019. Enacting a New Toledo Municipal Code Chapter 768, Pay Equity Act to Prohibit the Inquiry and Use of Salary History in Hiring Practices in the City of Toledo. O-173-19. <https://toledo.legistar.com/LegislationDetail.aspx?ID=3911922&GUID=F109B51B-1960-4700-AF21-B45D77BAF464&Options=&Search=>.
- Clark, Greg.** 2019. "New Executive Pay Transparency Measures Come into Force." *Gov.UK*, January 1. <https://www.gov.uk/government/news/new-executive-pay-transparency-measures-come-into-force>.
- Commonwealth of Virginia.** 2016. "Virginia State Salaries." DataPoint. <https://www.datapoint.apa.virginia.gov/salaries.php> (accessed on November 7, 2023).
- Connecticut Office of the State Comptroller.** 2015. "Payroll Summary 2015." OpenPayroll. https://openpayroll.ct.gov/#/year/2015/card/payroll_summary (accessed on November 7, 2023).
- Cruces, Guillermo, Ricardo Perez-Truglia, and Martin Tetaz.** 2013. "Biased Perceptions of Income Distribution and Preferences for Redistribution: Evidence from a Survey Experiment." *Journal of Public Economics* 98: 100–112.
- Cullen, Zoë, Shengwu Li, and Ricardo Perez-Truglia.** 2022. "What's My Employee Worth? The Effects of Salary Benchmarking." NBER Working Paper 30570.
- Cullen, Zoë B., and Bobak Pakzad-Hurson.** 2023. "Equilibrium Effects of Pay Transparency." *Econometrica* 91 (3): 765–802.
- Cullen, Zoë, and Ricardo Perez-Truglia.** 2022. "How Much Does Your Boss Make? The Effects of Salary Comparisons." *Journal of Political Economy* 130 (3): 766–822.
- Cullen, Zoë, and Ricardo Perez-Truglia.** 2023. "The Salary Taboo: Privacy Norms and the Diffusion of Information." *Journal of Public Economics* 222: 104890.
- Deloitte.** 2021. *Sustainable Finance Disclosure Regulation: Is the Financial Industry Ready for the Big One?* London, UK: Deloitte.
- Department of Justice (DOJ), and Federal Trade Commission (FTC).** 2016. *Antitrust Guidance for Human Resource Professionals*. Washington, DC: DOJ and FTC.
- Deserrano, Erika, Philipp Kastrau, and Gianmarco León-Ciliotta.** "Promotions and Productivity: The Role of Meritocracy and Pay Progression in the Public Sector." CEPR STEG Working Paper 037.
- Dewatripont, Mathias, Ian Jewitt, and Jean Tirole.** 1999. "The Economics of Career Concerns, Part I: Comparing Information Structures." *Review of Economic Studies* 66 (1): 183–98.
- Diamond, Peter A.** 1982. "Wage Determination and Efficiency in Search Equilibrium." *Review of Economic Studies* 49 (2): 217–27.

- District of Columbia.** 2014. "Public Employee Salary Information." Department of Human Resources, Government of the District of Columbia. <https://dchr.dc.gov/public-employee-salary-information> (accessed on November 7, 2023).
- Dreisbach, Tom.** 2014. "Pay Secrecy Policies at Work: Often Illegal, and Misunderstood." *NPR*, April 13. <https://www.npr.org/2014/04/13/301989789/pay-secrecy-policies-at-work-often-illegal-and-misunderstood>.
- Dube, Arindrajit, Suresh Naidu, and Adam D. Reich.** 2022. "Power and Dignity in the Low-Wage Labor Market: Theory and Evidence from Wal-Mart Workers." NBER Working Paper 30441.
- Duchini, Emma, Stefania Simion, Arthur Turrell, and Jack Blundell.** 2022. "Pay Transparency and Gender Equality." Unpublished.
- Edwards, Matthew A.** 2005. "The Law and Social Norms of Pay Secrecy." *Berkeley Journal of Employment and Labor Law* 26: 41–63.
- European Commission.** 2017. *Pay Transparency in the EU: A Legal Analysis of the Situation in the EU Member States, Iceland, Liechtenstein and Norway*. Brussels: European Commission.
- Feldstein, Martin, and James Poterba.** 1984. "Unemployment Insurance and Reservation Wages." *Journal of Public Economics* 23 (1-2): 141–67.
- Flynn, James.** 2022. "Salary Disclosure and Individual Effort: Evidence from the National Hockey League." *Journal of Economic Behavior and Organization* 202: 471–97.
- Frey, Valerie.** 2021. "Can Pay Transparency Tools Close the Gender Wage Gap?" *OECD*. <https://www.oecd.org/gender/Pay-Transparency-2021-Policy-Brief.pdf>.
- Frimmel, Wolfgang, Bernhard Schmidpeter, Rene Wiesinger, and Rudolf Winter-Ebmer.** 2022. "Mandatory Wage Posting, Bargaining and the Gender Wage Gap." Johannes Kepler University of Linz, Department of Economics Working Paper 2202.
- Fuster, Andreas, Ricardo Perez-Truglia, Mirko Wiederholt, and Basit Zafar.** 2022. "Expectations with Endogenous Information Acquisition: An Experimental Investigation." *Review of Economics and Statistics* 104 (5): 1059–78.
- Gallani, Susanna, Tiffany Y. Chang, Brian J. Hall, and Jee Eun Shin.** 2017a. "Buffer.com." Harvard Business School Case 917-019.
- Gallani, Susanna, Tiffany Y. Chang, Brian J. Hall, and Jee Eun Shin.** 2017b. "Buffer.com (B)." Harvard Business School Case 917-020.
- Gely, Rafael, and Leonard Bierman.** 2003. "Pay Secrecy/Confidentiality Rules and the National Labor Relations Act." *Journal of Labor and Employment Law* 6: 120–56.
- Gibbons, Robert, and Kevin J. Murphy.** 1992. "Optimal Incentive Contracts in the Presence of Career Concerns: Theory and Evidence." *Journal of Political Economy* 100 (3): 468–505.
- Gibbons, Robert, and Michael Waldman.** 1999a. "A Theory of Wage and Promotion Dynamics inside Firms." *Quarterly Journal of Economics* 114 (4): 1321–58.
- Gibbons, Robert, and Michael Waldman.** 1999b. "Careers in Organizations: Theory and Evidence." In *Handbook of Labor Economics*, Vol. 3B, edited by Orley C. Ashenfelter and David Card, 2373–2437. Amsterdam: North Holland.
- Gittleman, Maury, and Brooks Pierce.** 2013. "How Prevalent is Performance-Related Pay in the United States? Current Incidence and Recent Trends." *National Institute Economic Review* 226 (1): R4–R16.
- Gobierno de la Provincia de Córdoba.** 2022. *Portal de transparencia*. <http://transparencia.cba.gov.ar/>.
- Goldfarb, Avi, and Catherine Tucker.** 2012. "Shifts in Privacy Concerns." *American Economic Review* 102 (3): 349–53.
- Government of Canada.** 2018. *Pay Equity Act*. Ottawa: Government of Canada Publications.
- Government of UK.** 2019. "The Companies (Directors' Remuneration Policy and Directors' Remuneration Report) Regulations 2019." <https://www.legislation.gov.uk/uksi/2019/970/contents/made>.
- Green, Jeff, Ella Ceron, and Alexandre Tanzi.** 2022. "NYC Aims to Close Stubborn Gender Pay Gap with Salary Disclosure." *Bloomberg*, February 3. <https://www.bloomberg.com/news/articles/2022-02-03/nyc-aims-to-close-stubborn-gender-pay-gap-with-salary-disclosure#xj4y7vzkg>.
- Gulyas, Andreas, Sebastian Seitz, and Sourav Sinha.** 2023. "Does Pay Transparency Affect the Gender Wage Gap? Evidence from Austria." *American Economic Journal: Economic Policy* 15 (2): 236–55.
- Hall, Robert E., and Alan B. Krueger.** 2012. "Evidence on the Incidence of Wage Posting, Wage Bargaining, and On-the-Job Search." *American Economic Journal: Macroeconomics* 4 (4): 56–67.
- Harris, Milton, and Bengt Holmstrom.** 1982. "A Theory of Wage Dynamics." *Review of Economic Studies* 49 (3): 315–33.
- Hauser, Oliver P., and Michael I. Norton.** 2017. "(Mis)perceptions of Inequality." *Current Opinion in*

- Psychology* 18: 21–25.
- Holmström, Bengt.** 1999. “Managerial Incentive Problems: A Dynamic Perspective.” *Review of Economic Studies* 66 (1): 169–82.
- HR Dive.** 2022a. “Salary History Bans: A Running List of States and Localities That Have Outlawed Pay History Questions.” <https://www.hrdiver.com/news/salary-history-ban-states-list/516662> (accessed on November 7, 2023).
- HR Dive.** 2022b. “A Running List of States and Localities That Require Employers to Disclose Pay or Pay Ranges.” <https://www.hrdiver.com/news/pay-transparency-law-tracker-states-that-require-employers-to-post-pay-range-or-wage-range/622542> (accessed on November 7, 2023).
- Hvidberg, Kristoffer B., Claus Kreiner, and Stefanie Stantcheva.** 2020. “Social Positions and Fairness Views on Inequality.” NBER Working Paper 28099.
- Illinois State Comptroller.** 2021. “Salary Database.” Illinois State Comptroller. <https://illinoiscomptroller.gov/financial-reports-data/data-sets-portals/salary-database?IssueYear=2021> (accessed on November 7, 2023).
- International Labour Organization.** 2022. *Pay Transparency Legislation: Implications for Employers’ and Workers’ Organizations*. Geneva, Switzerland: International Labour Organization.
- Jäger, Simon, Christopher Roth, Nina Roussille, and Benjamin Schoefer.** 2021. “Worker Beliefs about Outside Options.” NBER Working Paper 29623.
- Jensen, Robert.** 2010. “The (Perceived) Returns to Education and the Demand for Schooling.” *Quarterly Journal of Economics* 125 (2): 515–48.
- Johanson, Mark.** 2021. “Why Companies Don’t Post Salaries in Job Adverts.” *BBC*, September 22. <https://www.bbc.com/worklife/article/20210921-why-companies-dont-post-salaries-in-job-adverts>.
- Kiatpongsan, Sorapop, and Michael I. Norton.** 2014. “How Much (More) Should CEOs Make? A Universal Desire for More Equal Pay.” *Perspectives on Psychological Science* 9 (6): 587–93.
- Kluegel, James R., and Eliot R. Smith.** 1986. *Beliefs about Inequality: Americans’ Views of What Is and What Ought to Be*. New Brunswick: Aldine Transactions.
- Kreps, David M., and Robert Wilson.** 1982. “Reputation and Imperfect Information.” *Journal of Economic Theory* 27 (2): 253–79.
- Krishna, Vijay.** 2009. *Auction Theory*. Burlington, MA: Academic Press.
- Krueger, Alan B., and Andreas I. Mueller.** 2016. “A Contribution to the Empirics of Reservation Wages.” *American Economic Journal: Economic Policy* 8 (1): 142–79.
- Kuhn, Peter, and Wulong Gu.** 1998. “A Theory of Holdouts in Wage Bargaining.” *American Economic Review* 88 (3): 428–49.
- Kuhn, Peter, and Wulong Gu.** 1999. “Learning in Sequential Wage Negotiations: Theory and Evidence.” *Journal of Labor Economics* 17 (1): 109–40.
- Kuziemko, Ilyana, Michael I. Norton, Emmanuel Saez, and Stefanie Stantcheva.** 2015. “How Elastic Are Preferences for Redistribution? Evidence from Randomized Survey Experiments.” *American Economic Review* 105 (4): 1478–1508.
- Lawler, Edward E.** 1965. “Managers’ Perceptions of Their Subordinates’ Pay and of Their Superiors’ Pay.” *Personnel Psychology* 18 (4): 413–22.
- Lazear, Edward.** 2018. “Compensation and Incentives in the Workplace.” *Journal of Economic Perspectives* 32 (3): 195–214.
- Lazear, Edward P., and Sherwin Rosen.** 1981. “Rank-Order Tournaments as Optimum Labor Contracts.” *Journal of Political Economy* 89 (5): 841–64.
- Littman, Margaret.** 2001. “The Silent Treatment: When it comes to salaries, what women don’t know can hurt them. What they do know can hurt your business.” *Working Woman* 26 (7): 38–43.
- Luttmer, Erzo F. P.** 2005. “Neighbors and Negatives: Relative Earnings and Well-Being.” *Quarterly Journal of Economics* 120 (3): 963–1002.
- Manning, Alan.** 2003. *Monopsony in Motion: Imperfect Competition in Labor Markets*. Princeton: Princeton University Press. <https://doi.org/10.1515/9781400850679>.
- Mas, Alexandre.** 2016. “Does Disclosure Affect CEO Pay Setting? Evidence from the Passage of the 1934 Securities and Exchange Act.” Princeton University Industrial Relations Section Working Paper 632.
- Mas, Alexandre.** 2017. “Does Transparency Lead to Pay Compression?” *Journal of Political Economy* 125 (5): 1683–1721.
- Matthews, Dylan.** 2019. “In Norway, You Can Look Up Your Neighbor’s Income on the Internet. That’s a Great Idea.” *Vox*, April 8. <https://www.vox.com/2016/5/19/11705746/tax-records-public-norway>.

- Midorikawa, Yoshie.** 2022. “New Rules Require Japanese Companies to Disclose Their Gender Wage Gap.” Society for Human Resource Management, August 4. <https://www.shrm.org/resourcesandtools/hr-topics/global-hr/pages/japan-gender-wage-gap.aspx>.
- Milgrom, Paul R.** 1981. “Good News and Bad News: Representation Theorems and Applications.” *Bell Journal of Economics* 12 (2): 380–91.
- Milgrom, Paul, and Robert Weber.** 1982. “A Theory of Auctions and Competitive Bidding.” *Econometrica* 50 (5): 1089–1122.
- Minami, Takero.** 2018. “Japan to Require Listed Companies to Disclose Executive Pay Rules.” *Nikkei Asia*, December 5. <https://asia.nikkei.com/Business/Companies/Japan-to-require-listed-companies-to-disclose-executive-pay-rules>.
- Minnesota Management and Budget.** 2011. “Payroll Data.” Transparency MN. <https://mn.gov/mmb/transparency-mn/payrolldata.jsp> (accessed on November 7, 2023).
- Mortensen, Dale T.** 1982. “The Matching Process as a Noncooperative Bargaining Game.” In *The Economics of Information and Uncertainty*, edited by John J. McCall, 233–58. Chicago: University of Chicago Press.
- Mortensen, Dale T.** 2005. *Wage Dispersion: Why Are Similar Workers Paid Differently?* Cambridge, MA: MIT Press.
- Mueller, Andreas I., Johannes Spinnewijn, and Giorgio Topa.** 2021. “Job Seekers’ Perceptions and Employment Prospects: Heterogeneity, Duration Dependence, and Bias.” *American Economic Review* 111 (1): 324–63.
- Nadworny, Katie.** 2022. “Israel: Equal Pay Reporting Obligations.” Society for Human Resource Management, May 12. <https://www.shrm.org/resourcesandtools/hr-topics/global-hr/pages/israel-equal-pay-reporting-obligations.aspx>.
- National Women’s Law Center (NLWC).** 2020. “Promoting Pay Transparency to Fight the Gender Wage Gap.” <https://nwlc.org/wp-content/uploads/2018/06/International-Pay-Transparency-Models-v2.pdf>.
- New Jersey Department of Labor (NJDOLE).** 2018. New Jersey Equal Pay Act. <https://www.nj.gov/oag/dcr/downloads/Equal-Pay-Act.pdf>.
- Norton, Michael I., and Dan Ariely.** 2011. “Building a Better America—One Wealth Quintile at a Time.” *Perspectives on Psychological Science* 6 (1): 9–12.
- Obama, Barack.** 2014. “Executive Order—Non-retaliation for Disclosure of Compensation Information.” Executive Order 13665. <https://obamawhitehouse.archives.gov/the-press-office/2014/04/08/executive-order-non-retaliation-disclosure-compensation-information>.
- Obloj, Tomasz, and Todd Zenger.** 2022. “The Influence of Pay Transparency on (Gender) Inequity, Inequality, and the Performance Basis of Pay.” *Nature Human Behavior* 6 (5): 646–55.
- Ockenfels, Axel, Dirk Sliwka, and Peter Werner.** 2015. “Bonus Payments and Reference Point Violations.” *Management Science* 61 (7): 1496–1513.
- O’Donoghue, Julie.** 2023. “Louisiana Will Make State Government Salaries Available to the Public.” *Louisiana Illuminator*, February 21. <https://lailluminator.com/briefs/louisiana-will-make-state-government-salaries-available-to-the-public/>.
- Percivalle, Uberto.** 2021. “Italy: Gender-Equality Reporting and Certification Bill Passed.” Society for Human Resource Management, November 16. <https://www.shrm.org/resourcesandtools/hr-topics/global-hr/pages/italy-gender-equality-reporting-and-certification.aspx>.
- Perez-Truglia, Ricardo.** 2020. “The Effects of Income Transparency on Well-Being: Evidence from a Natural Experiment.” *American Economic Review* 110 (4): 1019–54.
- Perez-Truglia, Ricardo, and Ugo Troiano.** 2018. “Shaming Tax Delinquents.” *Journal of Public Economics* 167: 120–37.
- Phillips, Macon.** 2009. “Now Comes Lilly Ledbetter.” <https://obamawhitehouse.archives.gov/blog/2009/01/25/now-comes-lilly-ledbetter>.
- Pissarides, Christopher A.** 1985. “Short-Run Equilibrium Dynamics of Unemployment, Vacancies, and Real Wages.” *American Economic Review* 75 (4): 676–90.
- Postel-Vinay, Fabien, and Jean-Marc Robin.** 2002. “The Distribution of Earnings in an Equilibrium Search Model with State-Dependent Offers and Counteroffers.” *International Economic Review* 43 (4): 989–1016.
- Reese, Phillip.** 2019. “See How Far Union Membership Has Declined in California.” *Sacramento Bee*, January 29. <https://www.sacbee.com/news/california/article225087150.html>.
- Robinson, Joan.** 1933. *The Economics of Imperfect Competition*. London, UK: Macmillan.

- Rosen, Sherwin.** 1986. "Prizes and Incentives in Elimination Tournaments." *American Economic Review* 76 (4): 701–15.
- Roussille, Nina.** 2021. "The Central Role of the Ask Gap in Gender Pay Inequality." Unpublished.
- Shepherd, Leah.** 2022. "Ireland Requires Employers to Report Pay Disparities by Gender." Society for Human Resource Management, May 9. <https://www.shrm.org/resourcesandtools/hr-topics/global-hr/pages/ireland-pay-disparities-by-gender.aspx>.
- Skoda, Samuel.** 2022. "Directing Job Search in Practice: Mandating Pay Information in Job Ads." Unpublished.
- Spinnewijn, Johannes.** 2015. "Unemployed but Optimistic: Optimal Insurance Design with Biased Beliefs." *Journal of the European Economic Association* 13 (1): 130–67.
- State of New Hampshire.** 2009. "State Employee Pay Search." Transparent NH. <https://business.nh.gov/paytransparency/PayTransparencyResults.aspx> (accessed on November 7, 2023).
- State of New Jersey Transparency Center.** 2010. "Public Payroll." State of New Jersey Department of the Treasury. <https://www.nj.gov/transparency/payroll> (accessed on November 7, 2023).
- State of Oregon.** 2016. "State Salaries" Oregon Transparency. <https://www.oregon.gov/transparency/pages/state-salaries.aspx> (accessed on November 7, 2023).
- State of Vermont.** 2017. "State of Vermont Employee Salaries." Vermont Data Portal. <https://data.vermont.gov/Government/State-of-Vermont-Employee-Salaries/jgqy-2smf> (accessed on November 7, 2023).
- Stigler, George J.** 1962. "Information in the Labor Market." *Journal of Political Economy* 70 (5 Part 2): 94–105.
- Sun, Shengwei, Jake Rosenfeld, and Patrick Denice.** 2021. "On the Books, off the Record: Examining the Effectiveness of Pay Secrecy Laws in the U.S." Institute for Women's Policy Research Report C494.
- Toronto Stock Exchange.** 2020. *Guide to Security Based Compensation Arrangements*. Toronto: TSX Inc.
- Trachtman, Richard.** 1999. "The Money Taboo: Its Effects in Everyday Life and in the Practice of Psychotherapy." *Clinical Social Work Journal* 27 (3): 275–88.
- TWSE.** 2021. Securities and Exchange Act Article 14. <https://law.moj.gov.tw/ENG/LawClass/LawAll.aspx?pcode=G0400001>.
- US Census Bureau.** 2020. "Post-secondary Employment Outcomes (PSEO)." https://lehd.ces.census.gov/data/pseo_experimental.html (accessed on November 7, 2023).
- US Securities and Exchange Commission.** 2015. "SEC Adopts Rule for Pay Ratio Disclosure." <https://www.sec.gov/news/press-release/2015-160>.
- US Securities and Exchange Commission.** 2022. "SEC Adopts Pay versus Performance Disclosure Rules." <https://www.sec.gov/news/press-release/2022-149>.
- Valdez, José Antonio, and Lucianna Polar.** 2018. "Peru: New Legislative Protection for Equal Pay." Society for Human Resource Management, February 16. <https://www.shrm.org/resourcesandtools/legal-and-compliance/employment-law/pages/global-peru-equal-pay-legislation.aspx>.
- Williams, Steven R.** 1987. "Efficient Performance in Two Agent Bargaining." *Journal of Economic Theory* 41 (1): 154–72.
- Wiswall, Matthew, and Basit Zafar.** 2014. "Determinants of College Major Choice: Identification Using an Information Experiment." *Review of Economic Studies* 82 (2): 791–824.
- Women's Bureau.** 2022. "Equal Pay and Pay Transparency Protections." US Department of Labor. <https://www.dol.gov/agencies/wb/equal-pay-protections> (accessed on November 7, 2023).

