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Working paper

The Sustainability Wage Gap

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RSM

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Abstract

Using administrative employer-employee matched data, we provide evidence that workers earn substantially lower wages in more sustainable firms. Examining both cross-sectional and time-series heterogeneity, we find that the wage gap is larger for high-skilled workers and increasing over time. We hypothesize that this *Sustainability Wage Gap* arises because workers with preferences for sustainability accept lower wages to work in more environmentally sustainable firms. Using a battery of additional tests, we argue that our results are difficult to reconcile with many alternative interpretations suggested in prior research such as a better work-life balance or better career opportunities.

Keywords: Wage differentials; Allocation of talent; Human capital; Sustainability; ESG; CSR; Preferences; Work-life balance; Career opportunities

JEL Codes: J24; J31; Q56; G32

1 Introduction

There is an ongoing debate about whether and how a firm's environmental, social, and governance (ESG)[1] characteristics contribute to its financial performance. Meta-analyses summarizing the existing body of research (see, for instance, Margolis, Elfenbein, and Walsh, 2007; Friede, Busch, and Bassen 2015; or Atz et al., 2023) typically suggest that a firm's ESG or sustainability performance correlates positively with its financial performance, especially research studies focusing on the firm rather than the investor level. Overall, however, the interpretation of the existing evidence remains difficult as reverse causation or alternative explanations based on omitted variables are also consistent with correlations between corporate ESG characteristics and financial performance. Moreover, less is known about the exact mechanisms through which ESG would translate into firm financial performance or corporate value.

Looking at the question of ESG's potential impact on firm value from a Finance 101 perspective presents several possible explanations for a relation. First, firms with better ESG performance might enjoy lower discount rates, perhaps because they exhibit lower exposure to systematic risk. This idea is modelled and tested in Albuquerque, Koskinen, and Zhang (2019). Alternatively, investors may also have explicit preferences for holding companies with strong ESG profiles (e.g., Bonnefon et al., 2022; Pastor, Stambaugh, and Taylor, 2021, 2022). Finally, ESG might also provide hedges against climate risk (Engle et al., 2020), all of which would suggest lower discount rates for firms with better ESG profiles. Taken together, all of the above would suggest that ESG affects firm value through a cost of capital channel.

Apart from an ESG valuation effect originating from a discount rate channel, firm value might also be associated with a firm's ESG performance because firms with better ESG profiles have higher free cash flows (FCFs). One explanation for such a FCF effect could be that customers care about the ESG characteristics of firms and are, for instance, inclined to pay higher prices for products from firms with better ESG credentials (e.g., Servaes and Tamayo, 2015; Meier et al., 2023). Customers could also be more loyal to more sustainable firms, a mechanism that has been explored in the context of mutual funds in Bollen (2007). Moving beyond a possible customer related FCF effect of ESG, prior research has also shown that firms with more satisfied employees exhibit both more positive earnings surprises and positive risk- adjusted excess returns (Edmans, 2011). The evidence presented in Edmans (2011) is also consistent with idea that ESG is related to firm value through a FCF channel.

In this paper we explore a novel and concrete FCF channel through which ESG affects firm value. Specifically, we argue that firms with better sustainability credentials can reduce

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[1] As discussed more comprehensively in Online Appendix (Section 3), Sustainability, Corporate Social Responsibility (CSR), and the recently popularized umbrella concept ESG (Environmental, Social and Governance) are all related and difficult to delineate exactly. We believe that these concepts are ultimately concerned with similar matters, namely how firms address social and environmental issues—or more generally— firms' overall societal impact. In our paper, we assume that measures of sustainability, "ESG", and "CSR" tend to be positively correlated and we choose to refer to them collectively as "Sustainability" or "ESG."

labor costs (and thus increase FCFs) because workers have explicit preferences for ESG and positively value the environmental sustainability of the companies or sectors in which they work. As a result, workers are willing to accept *lower* wages to work in more sustainable firms and sectors, which allows such firms to hire the same human capital at a lower cost (or, equivalently, more productive human capital at the same cost). Consequently, firms with better ESG profiles can, all other things equal, increase FCFs by lowering their wage bill.

Using detailed employer-employee matched data from Sweden, we provide novel evidence that workers indeed have preferences for environmental sustainability and are willing to accept lower wages to work in more sustainable firms and sectors. We coin this empirical regularity the *Sustainability Wage Gap*. The sustainability wage gap is 8.7% in our baseline specification, comparing workers in the top quintile of our sustainability measure with the remaining workforce. Compared to the wage gap of social workers, a profession known for employing workers who are mission-/purpose-driven as well, we find the sustainability wage accounting for about half of the "social worker wage gap".

Additional cross-sectional and time-series analyses show that this Sustainability Wage Gap is larger for more skilled workers and increasing over time, consistent with survey and anecdotal evidence that preferences for protecting the environment are more pronounced among highly skilled individuals and younger birth cohorts such as Generation Y (Millennials) and Generation Z. The more pronounced sustainability wage gap for younger and more skilled workers carries important implications for firms' human resource and competitive policies and thus for firm value, because our evidence suggests that to attract and retain the most productive workers, firms' ESG profiles play an increasingly important role. Last, using a large labor force survey, we also show that workers in more sustainable sectors exert more effort measured by the number of working hours per week.

We start our analysis by motivating the Sustainability Wage Gap using an online survey. The survey produces several pieces of evidence consistent with our main hypothesis: first, more than half of the surveyed individuals care about the environmental sustainability of their jobs and these preferences tend to be more pronounced for more skilled individuals. The survey also demonstrates that individuals are willing to accept lower wages to work for more sustainable firms. Specifically, the Sustainability Wage Gap is almost 20% conditional on willingness to accept a wage cut to work for a more environmentally sustainable employer and about 10% unconditionally. Using (self-reported) relative academic performance as an indicator for skill (or talent), we find that preferences for more sustainable jobs are more pronounced for more skilled individuals. Moreover, close to 82% of the survey participants in our survey also state that they would be willing to work harder in more sustainable firms.[2]

While the evidence based on our survey is consistent with the main premise of our paper— i.e., people are willing to work for less in more sustainable organizations—it is not clear if survey responses capture intentions only, or whether stated intentions also translate

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[2] Our survey results are also consistent with a representative labor market survey from the International Social Survey Programme (ISSP). For more details on the ISSP evidence, please refer to Section 7 of the Online Appendix.

into true labor market outcomes. To overcome this concern, our main analysis uses administrative employer-employee matched data from Sweden. This data contains highly detailed information on wages, standard Mincerian controls such as age and education, as well as information on occupation, and detailed measures of cognitive as well as non-cognitive skills from military enlistment tests. To test whether workers do indeed accept lower wages to work in firms that are considered more sustainable, we combine the administrative labor data with a host of different sustainability measures, both at the firm- and the sector-level. Specifically, we use (i) standard firm-level best-in-class ESG ratings produced by a commercial data provider, (ii) ESG news data, (iii) industry-level greenhouse gas emissions data from the Swedish Environmental Protection Agency, and (iv) a novel survey-based measure that quantifies the environmental sustainability of economic activities.

Using firm-level ESG ratings, which nowadays figure prominently in financial economics research (see, for example, Lins, Servaes, and Tamayo, 2017; Dyck et al., 2019), we show that firms with better environmental ratings pay lower wages. Based on our analysis using environmental ratings, we find that, on average, the most sustainable firms in a sector pay between 2-4% less. In those tests, we can also control for social and governance ratings, addressing the concern that more environmentally sustainable firms in a sector are also more likely to offer other non-wage benefits.

Another potential concern with our finding could be related to unobserved worker heterogeneity. For instance, individuals who self-select to work for more sustainable firms might be less skilled than workers in other firms, which, in turn, could explain lower wages. Given our detailed employer-employee matched data, we can control for many worker characteristics such as education and experience as well as for—*usually unobservable*—talent measures such as a worker's cognitive and non-cognitive skills, which we obtain from military enlistment tests. Note that our tests also control for the occupation of the individual (e.g., secretary, lawyer, etc.), and thus our analysis compares the wages of two otherwise similar workers in the same occupation and the same *sector,* one of which works for firms having better ESG performance.

In further firm-level tests, we analyze whether wages react to negative firm-specific ESG shocks using negative ESG news data from RepRisk, a data provider specialized in monitoring negative firm-specific ESG news events (Gantchev and Gianetti, 2022; Derrien et al., 2023). Using news-based shocks to firms' ESG performance, we document that firms subject to negative ESG news tend to increase wages (which include bonus payments) by 6.5% in the year following the negative ESG news incidents. This evidence is again consistent with the Sustainability Wage Gap hypothesis. In a last test using firm-level ESG ratings, we provide some suggestive evidence that the Sustainability Wage Gap is relatively larger for the most skilled individuals, consistent with our motivational survey evidence.

Nonetheless, employing firm-level ESG ratings comes with certain drawbacks. For instance, there are known methodological issues with ESG ratings related to divergence and backfilling (see, for example, Berg, Koelbel and Rigobon, 2022; Berg, Fabisik, and Sautner, 2021; Gibson, Krueger, and Schmidt, 2021). Furthermore, it is not always obvious how these

ratings are constructed ("black box") and it remains unclear whether workers in fact know and/or understand firms' ESG ratings. Last, firm-level ESG ratings are generally only available for large and listed firms in the most recent past, which is a limitation as Sweden's stock market is small and hence the cross-section of listed firms relatively limited. To overcome these limitations, we complement the previous analysis using two sector-based measures of sustainability.

The first sector-level measure is based on objective greenhouse gas emissions (GHG) data collected by the Swedish Environmental Protection Agency. We use sector-level GHG emissions intensity, which is defined as total GHG emissions of a sector scaled by its total number of employees.

The second sector-level sustainability measure comes from a survey that we develop explicitly for the analysis in this paper. To construct this measure, we ask a sample of online survey participants to classify 95 different economic sectors (covering 98% of the Swedish private sector worker population) in terms of their environmental sustainability but also their social and governance practices, the two other dimensions of an "ESG" measure. Moreover, we use the same survey to also elicit participants' explicit perceptions on other job-related dimensions of a sector such as, for instance, work-life balance, career opportunities, or the extent to which work in the sector is physically demanding. We consider this survey-based measures particularly suitable for our analysis: (i) In our setting, workers' *perceived* sustainability performance of a firm is most relevant, as workers' perceptions are most likely to shape their job choices. (ii) In contrast to the potential problems with ESG ratings, the survey- based sector-level measures are based on an intuitive, straightforward, and transparent methodology. (iii) Given that it is an industry measure, our perceived sustainability measure is also available for private companies. (iv) Another key advantage of our survey-based measure is that the environmental sustainability of a firm's main economic activity is likely to be more comprehensible for potential workers than information captured by commercially available ESG ratings (and to some extent GHG emissions as well). (v) In order to address the concern that the environmental sustainability of a sector could be correlated with other sector-level job characteristics, we also ask about other characteristics such as social and governance practices, work-life balance and career opportunities. Even experimental studies that apply random assignment of ESG to firms but do not fix the other dimensions cannot address this issue. Indeed, an ESG component of a sector sends a signal to workers about other dimensions of that firm or job as well. In contrast, the richness of our survey measures allows to estimate the impact of ESG on wages holding fixed the level of other industry characteristics. On top of providing external validity to experimental evidence, we consider this an important contribution of our paper on aspects of internal validity as well.

In the sector-level tests, we compare two otherwise similar workers, in the same occupation, in the same municipality, in the same year – one who works in a firm that is part of a sustainable sector vs. one who works in a firm that belongs to an unsustainable sector. We would like to stress that this analysis does not compare wages for *Green Jobs* with wages for *Polluting Jobs* or *Non-Green-task jobs* (see OECD, 2023) but rather, compares

the wages of otherwise similar workers in the *same* occupation but in different sectors.[3] In addition, we also estimate regressions focusing on samples of "generic jobs", i.e., occupations that are independent of a specific sector and, literally, exist in all firms and sectors (and with potentially deeper labor markets). Examples of such occupations are, for instance, secretaries, human resource officers, legal specialists, or IT professionals. For instance, when comparing wages for some of those selected occupations (e.g., secretaries, lawyers, or human resource professionals) we find that the Sustainability Wage Gap for these occupations ranges from about -7.2 % for executives and directors to -18.6 % for human resources professionals. In estimations using *all* occupations, we find robust evidence that workers in firms that belong to the most sustainable sectors earn about 9-15% lower wages, a figure that is remarkably similar in magnitude to the Sustainability Wage Gap that we find in our survey (i.e., about 10 percent). Importantly, in all the regressions we control for cognitive and non-cognitive skills, detailed occupational information, as well as for regional differences addressing the concern that more sustainable industries are clustered in areas with lower living costs, for instance.

In further tests, we also analyze how wages of workers *change* after workers switch sectors. We conduct two types of tests. First, we exploit the panel structure of our data and include worker fixed effects. One concern with this specification is that it implicitly assumes that workers randomly move between firms and sectors, an assumption that is unlikely to be true since job changes are likely to be correlated with time-varying characteristics of workers such as expected changes in household compositions or changes in preferences. Thus, in a second set of tests using event study type regressions, we investigate job switches that happened for arguably more exogenous reasons, i.e., job switches resulting from firms going bankrupt or being subject to mass layoffs. Consistent with the wage gap hypothesis, we find that workers who move from more (less) sustainable to less (more) sustainable sectors experience a wage increase (decrease).

We also examine heterogeneity in the documented Sustainability Wage Gap and find that the wage gap is larger for workers with high cognitive or non-cognitive skills. Further analysis also points to a widening of the Sustainability Wage Gap over time, and even more so for the most skilled workers. The latter evidence is consistent with the intuitive notion of environmental sustainability having become more important recently. Thus, our findings are particularly relevant for firms today as younger cohorts are climbing the corporate ladder. Accommodating the sustainability preferences of these younger workers might be a decisive factor for firms to attract the most skilled workers, including workers with high non-cognitive skills, a component of skill that has been found to be of growing importance in the workplace (Deming, 2017).

In a last set of tests, we also examine the hypothesis that workers in more sustainable sectors are more willing to exert higher effort. Making use of a large labor force survey, we proxy for effort by the number of hours a worker usually works per week. We find that

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[3] Interestingly, the OECD report documents a green-task job wage premium which can almost be fully explained by experience and education. We, however, keep all those dimensions constant and compare two workers in more vs. less environmentally sustainable firms or sectors.

workers in more sustainable sectors do work more hours per week and are more likely to work more extreme hours (i.e., more than 50 or 60 hours per week), again consistent with the main premise of our paper.

The Sustainability Wage Gap channel has important implications for firms. Benabou and Tirole (2010) argue that one reason for why firms engage in sustainable business practices is that such behavior can contribute positively to firm value, and thus firms can "do well by doing good." We believe that our analysis makes a step forward in identifying a novel channel through which a firm's sustainability policies can affect its FCFs and thus create value for shareholders, namely through the reduction of a firm's wage bill. Overall, our results are consistent with the idea that adopting better sustainability policies at the firm-level can increase a firm's bottom line and hence firm value. The firm-level benefits resulting from the Sustainability Wage Gap are potentially big as labor costs can represent a sizeable fraction of total costs and are also often large when compared to a firm's asset base. For instance, in our sample, Swedish firms in the middle of the sustainability distribution have a ratio of labor expenses to total costs of 31.5%. Similarly, the ratio of labor expenses to total assets is 52.3%. Back-of-the-envelope calculations suggest that the relative increase in return on assets (ROA) is 17.5% when a firm moves from the middle to the top of the sustainability distribution, and, by doing so, saves about 10% of its labor costs. While our evidence suggests that more sustainable firms face lower labor costs and possibly higher ROA, we cannot observe the net effects of the Sustainability Wage Gap on a firm's FCFs as we are unable to observe the direct costs associated with adopting more sustainable policies. In a sense, it might prove disproportionally costly for firms to improve their ESG credentials, which could completely offset any positive FCF effect resulting from a lower wage bill. The specific limitation of not observing the cost of improving ESG policies is not unique to our setting but applies more generally to research concerned with firms' sustainability practices given that detailed firm-level measures quantifying the costs associated with improving ESG policies do not exist.

While we rely on non-experimental data, we would like to point out that even if there was random assignment of ESG policies to firms (or random assignment of sustainability levels to sectors), an interpretation of the estimated coefficients of ESG/sustainability on wages or other labor outcomes remains challenging. Indeed, firms may experience other changes because of changes in ESG policies or changes of sector level sustainability. For instance, changes in ESG might be associated with higher profitability, which directly affect wages or retention but are unrelated to changes in the worker-value alignment. In a similar spirit, workers might form beliefs regarding a firm's likelihood of offering other job amenities depending on a firm's ESG policies. Experimental research in this domain usually randomizes the ESG profile and other amenities of a company/job descriptions (see, for instance, Burbano (2016) or Colonnelli et al. (2023)). Those ESG characteristics can act as signals for other amenities as well. For instance, perceptions of work-life-balance characteristics or career opportunities might depend on the ESG or sustainability profiles of firms and sectors.

We believe that our setup is a step forward in addressing those types of concerns as well. First of all, let us stress again that what is most relevant for worker's job choices are the

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worker- level *perceptions* of specific firm and sector attributes. In the case of the sustainability of a sector, we convincingly capture this perceived sustainability through our survey measure. Another important strength of our approach is that we can *explicitly control for perceptions of other industry characteristics* that might be associated with the perceived sustainability of a sector. Specifically, we leverage the same survey to obtain the worker perceptions of other industry characteristics that might be associated with sustainability (e.g., work life balance, job security, career opportunities, etc.).

Based on our analysis, we argue that the proposed Sustainability Wage Gap channel is more difficult to reconcile with reverse causation or other already proposed channels through which sustainability may explicitly (or implicitly) affect wages. We discuss these in what follows: First, many alternative explanations would predict *higher*, or at least not lower wages for workers of firms with better sustainability. Second, our survey reveals heterogeneous preferences for the sustainability of employers among different subpopulations of the labor force (i.e., by skill). Any alternative explanation would need to explain such differences as well. Econometrically, these additional hypotheses exploring cross-sectional differences across worker skill are important as well since they allow us to exploit within firm-year-variation and control for unobserved time-varying firm heterogeneity by including firm-year fixed effects. An example of such firm-year heterogeneity is profitability, for instance. Importantly, in the tests focusing on worker heterogeneity, we still find strong evidence consistent with the Sustainability Wage Gap hypothesis.

One possibility could be that high sustainability sectors offer non-wage amenities that are associated with lower wages. For instance, workers in more sustainable sectors could benefit from better work-life balance, e.g., by working fewer actual hours. Alternatively, sustainable sectors could offer better career opportunities, which would also be consistent with firms in these sectors paying lower wages. As discussed before, it is unlikely that high sustainability sectors exhibit higher work-live benefits given that workers in more sustainable sectors appear to work longer hours. We also explicitly test whether more sustainable sectors offer better career opportunities. Exploiting the long time-series dimension of our data, we do not find evidence that wages of those workers eventually catch up.

One might also be concerned with other known inter-industry wage differentials, as documented by the rich literature in labor economics (see, for instance, Krueger and Summers, 1988). We address this concern in several ways.

First, we proxy for known wage differentials at the sector-level using our rich set of demographic information and labor market outcomes. For instance, we calculate the yearly firing rate in each sector to proxy for firing risk. Our results remain robust to the inclusion of these additional controls.

Second, to further address the issue of compensating differentials and alternative explanations for our findings, we leverage our online survey: since we ask the survey respondents to rate sectors in terms of other known compensating differentials (e.g., work-life benefits or career opportunities), we can explicitly control for other perceived job amenities. When we use these survey-based assessments of sector-level compensating

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differentials alongside our main sustainability measure, we find that that the Sustainability Wage Gap remains highly significant and orders of magnitude larger than the wage gaps (or premiums) associated with the other sector characteristics (e.g., work-life benefits or dangerous working conditions).

Last, and importantly, we would like to highlight that the firm-level tests using best-in-class ESG ratings also address the concern of unobserved industry heterogeneity given that in those tests we compare workers within the same sector (at the 3-digit level), alleviating concerns that the documented wage differences are not driven by sustainability, but rather due to other sectoral differences.

The rest of the paper is organized as follows: In the next section, we discuss our contribution to the literature. Section 3 uses the data from our online survey to motivate our analysis and develop the main hypotheses. Section 4 introduces the main data sources and explains how we construct our measures for sustainability. Section 5 presents the main evidence on the Sustainability Wage Gap based on firm-level sustainability measures. Section 6 uses sector- level measures of sustainability to investigate labor market consequences of sustainability for the most skilled workers and also examines whether there are time trends in the Sustainability Wage Gap. Section 7 takes stock and presents a battery of additional tests aimed at ruling out leading alternative interpretations for our findings. In section 8, we present some back of the envelope calculations to better understand the implications of the magnitude of the Sustainability Wage Gap on a firm's financial performance. **Section 9 concludes.**

2 Related literature

In this paper, we contribute primarily to the labor and finance literature. We also add novel insights to research concerned with the financial performance implications of ESG by documenting a new channel through which sustainability could potentially affect the bottom line of firms. Second, we add to the debate on how to measure sustainability by proposing an intuitive and straightforward way of quantifying the sustainability of sectors. Our paper also connects to the rich labor-economics literature on across firm and inter-industry wage differentials and non-monetary incentives as well as the meaning of work.

Our paper contributes to the literature that studies the relation between sustainability policies and firms' financial performance. The evidence in this literature is ambiguous. For example, early meta-studies such as Margolis, Elfenbein, and Walsh (2007) show evidence of positive, negative, and no relation between financial performance and sustainability policies. However, more recent and comprehensive meta-studies argue in favor of a predominantly non- negative correlation between financial performance and sustainability characteristics (e.g., Friede, Busch, and Bassen, 2015; Atz et al., 2023), in particular when studies are conducted at the firm-level. Firms' sustainability efforts could translate into higher firm value either by lowering discount rates or by increasing FCFs. Several papers provide evidence that firms with better ESG performance exhibit lower cost of capital (e.g., Dunn, Fitzgibbons, and Pomorski, 2018; Albuquerque, Koskinen, and Zhang, 2019). In

contrast, prior research has been less able to identify exact channels and mechanisms through which ESG policies would affect a firm's cash flows. Servaes and Tamayo (2017) and Meier et al. (2023) are notable exceptions in this respect. They provide evidence consistent with the view that consumer care about ESG and that firms with better ESG policies can have higher firm value, possibly due to such firms being able to sustain higher margins by catering to sustainability aware customers and exploiting their willing to pay higher prices. While more sustainable companies might attract customers with sustainability preferences willing to pay higher reservation prices, it cannot be ruled out that products of more sustainable firms also exhibit higher quality and thus command higher prices. In relation to these papers, our paper identifies another, novel channel through which sustainability can potentially positively affect cash flows, namely through lowering a firm's wage bill.[4] Relative to the abovementioned consumer channel, we can control more directly for the quality dimension given that we have detailed demographic information including cognitive- and non-cognitive skills of the workers.

Another dimension along which we contribute to the literature is that many of the papers that study the question of whether firms can do well by doing good (see Benabou and Tirole 2010) fail to provide causal evidence of the respective channels. In particular, a simple reverse causation explanation, i.e., well-performing firms having more financial slack to invest into sustainability, appears to be an alternative explanation that is usually difficult to rule out. The availability of very granular data at the worker-level as well as additional predictions on specific subpopulations, derived from heterogeneity of workers' preferences for jobs in sustainable sectors, allows us to rule out many other explanations. Hence, we believe that our paper makes a step forward in identifying a specific channel through which sustainability can affect cash flows, namely lower labor costs.

Our paper also contributes to the discussion on the measurement of sustainability. There is an ongoing debate about the divergence, opaqueness, and methodological issues concerning commercially available ESG ratings (Berg, Koelbel, and Rigobon, 2022; Gibson, Krueger, and Schmidt, 2021). Recent research also points to ESG data providers "rewriting history" by changing historical ESG ratings (see Berg, Fabisik, and Sautner, 2021). We offer a novel and intuitive sector-wide measure of the environmental sustainability of firms based on a simple survey that can be easily replicated and applied in other, related domains. Using our measure, we also show that individuals form meaningful expectations about the sustainability of different sectors and that those expectations have real consequences.

We also contribute to the rich labor economics literature on wage differentials. A large body of work starting at least with Slichter (1950) documents significant industry-differences in wages paid to workers (Schweitzer, 1969; Dickens and Katz, 1987; Krueger and Summers, 1988; Katz and Summers, 1989; Murphy and Topel, 1990). Our analysis

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[4] While our evidence shows that more sustainable firms face lower labor costs and possibly higher ROA, we cannot observe the net effects of the Sustainability Wage Gap on a firm's profitability as we are unable to observe the direct costs associated with investments in more sustainable policies. This specific limitation is not unique to our setting but applies more generally to research concerned with firms' sustainability practices given that detailed firm-level measures quantifying the costs of improving sustainability do not exist.

suggests that some of these inter-industry wage differentials can potentially be attributed to the environmental sustainability characteristics of different industrial sectors, in particular since we explicitly control for typically unobservable ability measures which have been thought to be behind some of the observed wage differences across sectors (Gibbons and Katz, 1992; Gibbons et al., 2005).

Last, we also add to a large literature on non-monetary incentives and the meaning of work or status in labor economics. In a sense the environmental sustainability of an employer could be seen as a component of the meaning or status of a job. Ex-ante it is not clear whether meaning of work (or the status of a job) and monetary compensation are substitutes or complements. For instance, high pay in environmentally sustainable jobs may weaken the signal that an individual cares for the environment (e.g., Frey, 1997; Benabou and Tirole, 2006; or Ariely, Bracha, and Meier, 2009). On the contrary, the economic literature on status typically assumes that the value of an extra dollar (or consumption) is higher for workers with higher status (e.g., Ferreira and Nikolowa, 2023; Hopkins and Kornienko, 2004; Becker, Murphy, and Werning, 2005; Auriol and Renault, 2008; Ray and Robson, 2012; and Auriol, Friebel, and von Bieberstein, 2016). Cassar and Meier (2018) summarize the literature and point out that, "in principle, job meaning could be either a substitute or a complement to monetary compensation, which in turn will influence whether people accept lower pay for a meaningful job, or whether job meaning and pay tend to rise together. The evidence on this point is mixed." Our findings show that workers accept lower wages to work for more environmentally sustainable employers, suggesting that in our setting *meaning* or *status*— as proxied by the environmental sustainability of the job— acts as a substitute to wages.

Dur and van Lent (2019) show that most workers care about having a socially useful job and suffer when they consider their job useless. We show that workers are willing to "pay" to work in a more environmentally useful job by accepting lower wages and thus foregoing compensation. Relatedly, Gong and Grundy (2019) argue that lower wages act as coordination mechanism that allows socially conscious employees to achieve their preferred combination of private and public good consumption. Our paper is also closely related to Burbano (2016), Hedblom, Hickman, and List (2022), Colonnelli et al. (2023), Bunderson and Thakor (2020), or Schneider, Brun, and Weber (2020) who use mainly surveys and experiments to show that workers are willing to give up parts of their wages to work in more sustainable, more meaningful, or less immoral jobs. For instance, Hedblom, Hickman, and List (2022) make use of a very rich natural field experiment to show, among other results, that workers in socially responsible firms are more productive. Our analysis using observational data is complementary to their analysis and shows consistent results.

One reading of our findings is that more sustainable firms can recruit better (that is, more skilled) workers, for the same wage. This is also broadly consistent with recent work by Cen et al. (2022) who show that socially responsible firms are better at retaining workers. Relatedly, Burbano (2016) and Colonnelli et al. (2023) use online experiments to show workers accept lower wage bids for the same job after learning about the employer's social responsibility (e.g., up to lower 44% wages in Burbano (2016)). Those papers provide empirical evidence of revealed preferences for social responsibility in the workplace and of workers' willingness to give up pecuniary benefits for nonpecuniary benefits. They

also show stronger social preferences among the highest performers (more skilled workers), a point that our analysis also makes.

While the internal validity of such experiments appears high, they face at least two challenges. First, even if there was random assignment of social responsibility policies to firms, an interpretation of changes in wages or retention, for instance, remains challenging. Indeed, firms may experience changes unrelated to a worker-value alignment of the new policy, such as higher (expected) profitability, that affect wages or retention. Second, it remains unclear whether these findings generalize and transfer to workers in fact accepting lower wages. Our paper uses non-experimental data from the whole Swedish private sector working population to show the external validity of such preferences for sustainable jobs. At the same time, the internal validity of our analysis remains arguably high as we can include a set of very detailed worker-, occupation-, and sector-level controls, including detailed measures of skill and measures of expected or perceived other amenities. Moreover, we make use of an online survey to uncover important heterogeneities in the preferences for sustainable jobs. The insights on heterogeneous preferences for sustainable jobs also generate additional predictions regarding the Sustainability Wage Gap channel that we can test in our administrative wage data, and which are more difficult to reconcile with alternative explanations. On the empirical side, we make use of unique and granular measures of different dimensions of skills to show that the Sustainability Wage Gap is higher for workers with high cognitive, but also with high non- cognitive skills, a component of skill that has been found to be of growing importance in the workplace (see Deming, 2017).

3   The Sustainability Wage Gap – Survey evidence and hypotheses development

We argue that firms' sustainability policies can benefit their bottom lines by lowering labor costs. The main idea is that more sustainable firms can hire workers with explicit sustainability preferences at lower wages, or, equivalently, by offering a certain wage, they can hire workers that are more skilled. Two central assumptions underlying our main hypothesis are that

(i)   workers exhibit preferences for the environmental sustainability of their jobs and

(ii)   these preferences affect their labor market choices.

To motivate our analysis and illustrate that workers do indeed have preferences for the environmental sustainability of their jobs consistent with our main hypothesis we use data for 300 participants collected through a Prolific survey, which we ran in November 2021.[5]

Table 1 reveals that workers exhibit sustainability preferences related to their labor

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[5] The main hypotheses can also be motivated using the representative labor market survey from the International Social Survey Programme (ISSP). The ISSP is a cross-national collaboration that runs annual surveys on topics important to the social sciences and includes the Work Orientations Survey, which seeks to collect data on attitudes toward work and working conditions (see Dur and van Lent, 2019). For brevity, we explain this data and our tests in detail in Section 7 of the Online Appendix.

choices. In the survey, we ask participants in Question 7 how important it is for them to have an environmentally sustainable job. Our analysis reveals that 65% of the respondents state that it is either *Very important* or *Important* to them. Second, we demonstrate that individuals also display labor choices consistent with our main hypothesis. We do so by asking survey participants if they would consider accepting a lower wage to work for a more environmentally sustainable firm. We also ask the survey participants if they would be willing to work harder for an environmentally sustainable firm. The analysis shows that about 52% of the participants state that they would be willing to accept a wage cut to work for a more environmentally sustainable firm. The average wage concession is almost 20% (median of 15%) conditional on willingness to accept a wage cut and about 10% unconditionally. Consistent with the evidence from the Prolific survey we formulate our first hypothesis on the Sustainability Wage Gap:

Hypothesis 1: Workers in more sustainable firms are paid less.

Using our survey, we can also analyze whether preferences for sustainability aspects of employers are systematically related to the skill of workers. We posit that more highly skilled workers care more about the environmental sustainability of their jobs. Documenting such heterogeneity would be interesting for two reasons. First, accommodating the preferences of more skilled workers to attract and retain the most skilled workers is increasingly important for firms to remain competitive, in particular in today's knowledge-based economy. Second, heterogeneity in sustainability preferences leads to additional predictions which we can test in the administrative wage data, and which allow us to rule out possible alternative explanations. Our survey provides evidence that preferences for environmental aspects of jobs are systematically related to the skills (or talent) of a worker. To measure the skills of our survey respondents we ask them to answer the following two questions: "In high school, how was your academic performance relative to your classmates?" (Q5) and "Where did you rank in terms of your grades in high school?" (Q6). When conditioning responses to the question of "How important is it to have a job that is environmentally sustainable" (Q7) on high values of the survey-based proxies for skills, we generally find that more skilled respondents also exhibit stronger environmental preferences for their jobs. For instance, Table 1, Panel B shows that 78.5% of respondents who stated to have ranked in the Top 10 percent of their high-school class answered that it is important or very important to have an environmentally sustainable job. This figure is only 61.7% in the group of respondents outside of the Top 10. The difference in the responses between the two groups is significant at the five percent level. Secondly, the respondents who state that their academic performance in high school was much better relative to their classmates also attach more importance to the environmental sustainability of jobs. While 77.1% of respondents with above average high-school performance state that it is important or very important that their job is environmentally sustainable, this figure is only 47.9% in the group of respondents with below average performance. The difference in responses is statistically significant. Based on this, we formulate

Hypothesis 2: The Sustainability Wage Gap (Hypothesis 1) is larger for workers that are more skilled.

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Next, we explore the issue of trends in the Sustainability Wage Gap. For instance, anecdotal evidence suggests that firms find it increasingly difficult to retain talent and that Generation Y ("Millennials") and Z (i.e., cohorts born after 1990) have strong preferences for the meaning or purpose in their jobs. While we would like to test the prediction that environmental preferences vary across birth cohorts in the Prolific survey data, we do not have enough variation in terms of birth cohorts: the median age of our respondents is 24 years (see Online Appendix Table B.1) and the 95 percentile is 45 years. Given that we only have one single survey run, we can also not compare changes in sustainability preferences over time. However, other research suggests that environmental issues, in particular those related to climate change, have become more important over time. For example, Sautner et al. (2023) provide evidence that since the early 2000s, the extent to which climate change issues are discussed in corporate earnings conference calls has increased. In addition, our analysis of a representative labor market survey from the International Social Survey Programme (ISSP) (see the Online Appendix Section 7) also provides evidence that is consistent with the notion that preferences for sustainable jobs have increased over time. In line with this evidence, we state the following hypothesis:

Hypothesis 3: The Sustainability Wage Gap is increasing over time.

Last, the survey evidence also reveals that an economically large fraction of 82% state that—for the same wage—they would be willing to work harder for an environmentally sustainable firm (see Table 1, Panel A).[6] Accordingly, we hypothesize that

Hypothesis 4: Workers in more sustainable firms work harder.

While the evidence from the Prolific survey on the Sustainability Wage Gap hypothesis is suggestive (and also consistent with additional analysis of a representative labor market survey from the International ISSP)[7], it is not clear whether survey responses capture intentions only, or whether they also translate into true labor market outcomes. Thus, we will test Hypothesis 1 and to a certain extent Hypothesis 2 using detailed employer-employee matched data from Statistics Sweden and firm-level ESG ratings. We will then test all four hypotheses using two complementary, sector-level measures of sustainability (our own survey-based measure of sustainability and administrative data on greenhouse gas emissions across different sectors) in the entire population with a longer time-series component (Hypotheses 1 to 3) and making use of a representative labor force survey with information on working hours (Hypothesis 4).

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[6] This hypothesis is also in line with recent theoretical research by Geelen, Hajda, and Starmans (2023) who show that engagement in sustainability can benefit the owners when sustainability drives effort.

[7] See Section 7 of the Online Appendix.

4 Sustainability measures and administrative data

4.1 Measuring the sustainability of firms and sectors

In our empirical analysis, we use different ways to quantify the sustainability of firms and sectors. While we are agnostic about the precise definition of sustainability (see also our discussion in Section 3 of the Online Appendix), we do think that an increasingly important component of sustainability is the impact of firms on the environment. This is why we focus our analysis primarily on the environmental dimension of sustainability. In total, we use three different types of sustainability measures: First, we rely on traditional ESG data from commercial data providers that cover mostly large and listed firms. Second, we use our own survey in which participants evaluate sectors in terms of their environmental sustainability. Given its availability, simplicity, and its construction, we consider the survey-based measure most relevant for the decision making of workers and use it as our main measure. Most importantly, we believe that our survey measure best captures the *perceived* sustainability of a firm, which we believe is most relevant for workers' job choices. Last, we use objective greenhouse gas emissions data at the sector-level to distinguish sustainable and unsustainable sectors. In the following, we introduce the different measures and discuss the advantages and disadvantages of those in more detail at the end of this section.

4.1.1 Commercial ESG data and shocks to firms' ESG profiles

We start our analysis of the administrative data using standard commercial ESG ratings. These measures aim to evaluate if firms' policies and practices are compliant with ESG considerations. There are now many commercial data providers that rank and score firms in terms of their ESG policies, practices, and processes. Typically, these measures are "best in class", meaning that ESG policies of firms are examined relative to industry peers.

Despite the recognition that ESG ratings for the same firm can disagree across data providers (see Gibson, Krueger, and Schmidt, 2021; Berg, Koelbel, and Rigobon, 2022) such measures are now widely used in finance research (see, for example, Lins, Servaes, and Tamayo, 2017; Liang and Renneboog 2017). In our empirical tests, we use ESG ratings from MSCI. We focus on MSCI for two reasons: Studying the extent to which U.S. mutual funds holdings with an explicit ESG mandate are related to ESG ratings from five different data providers, Berg, Heeb, and Koelbel (2022) find that MSCI is likely to be the most influential ESG rating provider. We do not use Refinitiv, because Berg, Fabisik, and Sautner (2021) provide evidence that the Refinitiv data is subject to backfilling issues. One limitation of the MSCI ratings is that they are generally only available for publicly listed companies and in more recent periods. Note, however, that this criticism applies generally for most ESG ratings and is not unique to those issued by MSCI. Panel A of Table 2 reveals that depending on the granularity of the sector definition of peer firms (2- or 3-digit industry codes) we have between 227 and 400 firm-years of data. One big advantage of our sector-level measure(s), which we will discuss later in this section, is that we can use data on thousands of firms, covering 98% of our employment data.

In second set of tests leveraging commercial firm-level ESG data we use "event-driven"

ESG news data from RepRisk. This company identifies and tracks negative firm-level ESG news reported by third parties. The news is collected from media sources including newspapers, social media, online news, blogs, and NGOs using artificial intelligence and human analysis. Using proprietary methodology, RepRisk combines these news and event data into a reputational risk index (RRI) which falls in the interval of 0 and 100. The index increases when negative ESG news is reported for a firm. Higher values indicate higher negative ESG news flow. In case no further negative ESG news is published, the RRI decays naturally over time until it reaches zero. We use this data to identify negative "shocks" to a firm's ESG performance.

4.1.2 Survey based measure of the environmental sustainability of economic activities

One way of assessing a firm's sustainability performance is through assessing the quality of the firm's ESG policies and practices. Another way of thinking about a firm's sustainability is to examine whether a firm's primary economic activity is harmful to the environment. For instance, an oil company might obtain a good best-in-class ESG rating. Yet, the primary economic activity of drilling oil is arguably environmentally unsustainable in the long run. To assess the environmental sustainability of economic activities we make use of an online survey via Prolific, a participant recruitment tool for online surveys. In the survey, which we run in November 2021, participants are asked to (i) answer several questions regarding the importance of environmental aspects in choosing an employer and (ii) classify economic sectors both in terms of their environmental sustainability (1=unsustainable, 5=sustainable) and other dimensions (e.g., social responsibility, work-life-benefits).

In Online Appendix Table A.5, we show some demographic and other information of the survey participants. In total, we recruit 300 survey participants and balance male and female participants ex-ante. Our sample of 300 survey participants contains 50.33% male and 47.33% female participants. About 2.34% identify as Non-binary or Other in terms of gender. The mean age of the participants is 26 years. The respondents are mainly from developed countries (as defined by the OECD). On average, the respondents take about 26 minutes to complete the survey.

In Panel A (B) of Online Appendix Table A.6, we provide an overview of the ten most sustainable (unsustainable) industries according to the 300 survey participants. We focus on 95 economic sectors that cover 98% of employment in our matched worker-firm data. Section 4.2 in the Online Appendix shows the survey questions. Each survey participant is asked to classify 30 randomly drawn economic sectors in terms of sustainability, which leads to about 90 survey responses for each sector. Hence, we use about 90 individual survey responses to calculate the averages at the sector level. The average responses are highly plausible with mostly unsustainable activities such as extraction of crude petroleum and natural gas, manufacture of rubber and plastic products, or mining of coal being classified as unsustainable. In contrast, activities such as recycling of metal waste and scrap as well as

education are classified as being more sustainable.[8]

Classifying sectors in terms of environmental sustainability might be obvious for some economic activities, but difficult for others. Therefore, we always allow survey participants to choose the response "Do not know" (DNK). We examine the issue of DNK responses more systematically by plotting the percentage of DNK answers for a given sector against the average sustainability of the sector. Intuitively, the chart displayed in Online Appendix Figure A.3 suggests a hump-shape, indicating that sectors that end up in the middle of the environmental sustainability distribution are more difficult to classify in terms of their environmental sustainability (i.e., exhibit a higher fraction of DNK responses). In contrast, there is less uncertainty about the most sustainable and unsustainable sectors in the tails, as evidenced by a lower fraction of DNK answers. In particular, survey respondents appear most certain (low percentage of DNK answers) about the most sustainable industries (right tail). Hence, our empirical analysis will use primarily specifications that focus on the tails and thus the most informative parts of the distribution of the survey-based environmental sustainability measure. In the survey, we also explicitly ask the respondents to characterize sectors in terms of other potential compensating differentials. Similar in spirit to the sector-level sustainability classifications, each survey respondent is asked to rate ten randomly selected sectors in terms of several other dimensions. Section V of the survey (see Section 4.2. of the Online Appendix) lists the dimensions the survey respondents were asked to evaluate. For instance, we ask respondents to state their agreement (or disagreement) with statements like *Working in sector [xyz] is physical demanding or dangerous (high risk of accidents)* or *working in sector [xyz] allows for a good work-life balance.* We also ask the survey participants to evaluate the corporate governance or social responsibility of the sectors. Given that it could be difficult for survey respondents to rate certain sectors in terms of these other dimensions, we again allow for the answer of "Do not know". Based on about 30 survey evaluations per sector and evaluated dimension, we calculate the average sector characteristics, which we use as controls in some of the wage regressions later on. Given the possible correlation between sustainability and other sector amenities it is important to control for these dimensions in our tests.

4.1.3   Greenhouse gas emissions data

We also use greenhouse gas emissions data to construct an alternative measure of the environmental sustainability of a sector. There are several different greenhouse gases (e.g., carbon dioxide (CO_2), nitrous oxide (N_2O), Methane (CH_4), Sulphur hexafluoride (SF_6), etc.).

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[8] We also ran pilot surveys on a sample of second year Bachelor students in Economics and Management enrolled in a Corporate Finance lecture in December 2019 and 2020. Online Appendix Figure A.1 shows a scatterplot of the sector-level sustainability measures obtained from the 2019 and 2020 student populations. We find that the assessments of the sustainability of different industries is very stable across the 2019 and 2020 student cohorts, with the correlation being 0.92. Online Appendix Figure A.2 shows a scatter plot between the average industry classifications resulting from the student surveys in 2019 and 2020 and the Prolific sample in 2021. The correlation between the sustainability classifications from the Prolific and the student populations is also high (0.9136). Overall, our analyses of industry classifications resulting from different survey populations show that classifications do not vary much across samples, suggesting relatively high external validity of our survey-based approach to measuring the sustainability of economic activities.

These greenhouse gases have different "Global Warming Potential" (GWP). The concept of GWP was developed to allow comparisons of the global warming impacts of different gases. Typically, greenhouse gases are measured in metric tons of CO2e (MTCO2e), where CO2e stands for "CO2 equivalent". CO2e is a quantity that describes, for a given mixture and amount of greenhouse gas, the amount of CO2 that would have the same GWP.

The Swedish Environmental Protection Agency produces statistics on territorial emissions and removals of greenhouse gases. This data is available from Statistics Sweden (SCB). More specifically, the greenhouse gas emissions data is available from both a consumption and a production perspective. The consumption perspective considers emissions caused directly and indirectly by consumption. This could also include emissions that occur outside of Sweden. In contrast, from the production perspective, emissions are reported by the industry in which they occur. GHG emissions data typically aggregate various greenhouse gases and is standardized using GWP and measured in MTCO2e (Metric tons of carbon dioxide equivalents). In this paper, we use total greenhouse gas emissions from the production perspective as our primary variable. We focus on total emissions by 57 two-digit industries for which data is available for the years 1990 to 2021.

Emissions can be expressed in absolute or relative terms. Absolute measures quantify emissions in metric tons of CO2 equivalents and provide an indication of the total amount of GHG emissions for which a sector is responsible. To adjust for the size of an economic sector, we calculate relative emissions (or intensities) as total greenhouse gas emissions scaled by employees at the sector-level.

4.1.4 Discussion of the different sustainability measures

As outlined above, we use several different ways of quantifying sustainability. In this section we provide additional discussion on the relative merits of each.

One of the main advantages of our survey measure (relative to ESG ratings and sector-level GHG emissions) is that it quantifies the *perceived* environmental sustainability of a sector. However, our survey-based measure also has other important benefits. For example, our measure captures the overall environmental impact of a sector, whereas sector-level GHG emissions focus only on measuring the climate impact of a sector. It turns out that some sectors are relatively good in terms of our survey-based environmental measure but exhibit high GHG emissions. An example of such a sector is "Water collection and purification".

Another reason why our survey measure is better than GHG emissions at capturing the environmental performance of a sector is related to supply chain issues. For instance, some sectors that score poorly in terms of our survey measure (e.g., "Manufacturing of Plastic and Rubber Products") have relatively low sector-level GHG emissions, but primarily because the GHG emissions occur at upstream suppliers. The GHG emissions resulting from plastics production are due to energy consumption and are thus only imperfectly captured by the GHG emissions of the sector, since emissions occur at entities separate from the plastic producers (i.e., energy suppliers). Another reason for our measure being better is that GHG emissions rarely capture the emissions generated by usage of the products and services

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produced by a sector. For example, the sector "Manufacturing of cars" scores poorly according to our measure, but, at the same time, exhibits low GHG emissions, because the GHG emissions of the automotive sector does not include emissions that occur downstream or later in the product cycle due to product use.

Despite the abovementioned shortcomings of the sector-level GHG emissions measure and the limitations of the firm-level ratings, we do think that using several different measures has advantages given that they capture different dimensions. For instance, using ESG ratings allows us to compare workers from firms within the same sector, ruling out that the Sustainability Wage Gap is primarily driven by sector differences. Using sector-level GHG emissions allow us to zoom in on an arguably increasingly important subdimension of a sector's environmental performance, which is likely to be increasingly relevant to employees, especially younger ones.

4.2 Worker and wage data

Our main data source for the administrative worker information is the Longitudinal Integration Database for Health Insurance and Labor Market Studies (LISA), provided by Statistics Sweden (SCB). LISA contains employment information (such as employment status, the identity of the employer, and occupation), tax records (including labor and capital income), and demographic information (such as age, education, and family composition) for all individuals 16 years of age and older, domiciled in Sweden, starting in 1990. Our main analysis focuses on male workers for which we have skill measures from a military enlistment test and on the period after 2000 as our tests make use of detailed occupational information which is not available for the period between 1991 and 2000. However, we show that our results hold also for the sample of female workers in which we predict their cognitive skills based on detailed schooling information such as grades.[9] We also exclude workers in the public sector from our analysis given that it may be special with respect to wage setting and job security, for instance.[10] In LISA, the sector in which an Individual works is reported according to the Swedish Standard Industrial Classification (SNI) code at the level of the establishment at which they are employed. We aggregate establishment-level information and assign industry classification at the firm-level, based on the most frequent industry code.[11] For labor income, we use reported annual earnings before tax. Importantly, this information is not censored or top-coded, and includes bonus payments.

We also make use of skills measures consisting of estimates of cognitive and non-cognitive abilities from military aptitude tests. Cognitive ability (similar to IQ) was assessed through subtests covering logic, verbal, spatial, and technical comprehension. The four test results were aggregated into an overall integer valued score ranging from 1 (lowest) to 9 (highest), according to a Stanine (standard nine) scale that approximates a normal

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[9] See Table A.4 in the Online Appendix.

[10] When we do include the public sector in the analysis, it increases the magnitude of the Sustainability Wage Gap estimates.

[11] Note that a firm can have establishments in different sectors, for instance, if it is a multi-segment firm. In robustness tests, we find qualitatively and quantitatively very similar results using establishment-based industry classifications.

distribution with a mean of about 5 and standard deviation of about 2. A certified psychologist assessed the non-cognitive ability score through a 25-minute semi-structured interview. The individual was graded on his willingness to assume responsibility, independence, outgoing character, persistence, emotional stability, and power of initiative. The psychologist would weigh these components together and assign an overall non-cognitive score on a 1 to 9 Stanine scale. We complement these measures with detailed information on secondary education, including high-school grades and track choices, which enables us to impute a corresponding skills measure for women. Please refer to Böhm, Metzger, and Strömberg (2023) for more information on the imputed ability scores for women as well as for a more extensive discussion on the Swedish data in general.

We also use additional data from the Swedish Labor Force Survey (LFS) that collects data on actual working hours. Please note that these data cannot be linked to the other administrative data and, hence, we have more limited information of workers in this sample.

Table 2, Panel A provides descriptive statistics of the ESG data at the worker and firm level. All variables are defined and described in Online Appendix Table A.1. The employer-employee matched data is described in further detail in Section 8 of the Online Appendix.

5   The Sustainability Wage Gap: Do more sustainable firms pay lower wages?

We start our analysis by running some basic tests relating wages to firm-level ESG ratings. We complement the tests based on firm-level ESG ratings with tests using "event-driven" ESG data by RepRisk that identifies and tracks negative news related to firms' ESG policies. This allows us to analyze how wages of workers change because of to negative firm specific ESG *shocks*.

5.1   Do more sustainable firms pay lower wages than their peers?

Given our main hypothesis, in our firm-level tests using ESG ratings of MSCI, we focus on the environmental pillar. Indeed, we believe that it is more straightforward to objectively quantify the quality of a firm's environmental policies and practices since aspects such as water and energy use or greenhouse gas emissions can be measured. In contrast, scoring firms regarding social and governance aspects requires more value judgements and is thus inherently more subjective. Moreover, as we discuss in more detail below, the impact of the social (S) or the governance score (G) on wages is not obvious.

As pointed out before, ESG ratings are often relative to industry and/or geographical peer groups. We observe that the granularity of the industry peer-groups for MSCI ESG ratings lies somewhere between a 2- or 3-digit industry classification. In our regressions, we use peer firms in the same 3-digit industry as our main specification, but we also investigate peer groups at the 2-digit level.

In Panel A of Table 2, we show summary statistics for the individual components (or pillars)

of the ESG ratings of MSCI. We use simple dummy variables as regressors. Specifically, the dummy variables identify for each industry-year combination the firm with the highest ESG score. For instance, the variable *Environ. (high, 3d)* marks the firms each year that have the highest environmental ratings relative to their 3-digit industry peers. The mean value of *Environ. (high, 3d)* is 42% for MSCI suggesting that there are about two to three firms available in each industry-year cell. This implies that in the regressions, we are going to compare the best-in- class firm with one or two firms in the same sector.[12]

Panel B shows the results from the wage regressions using the ratings from MSCI. We focus on the male worker population for which we have skill measures from a military enlistment test but show in the appendix that our results hold also for the sample of female workers. In column (1), we regress the *Ln(Wages)* on standard Mincerian controls, and the best-in-class dummy in terms of environmental sustainability *Environ. (high, 3d)*. Our specifications include occupation-year fixed effects, dummy variables for each level of cognitive and non-cognitive skills, as well as industry-year fixed effects. This means we are comparing two workers with the same level of education, with the same cognitive and non-cognitive skills, working in the same year in the same occupation and industry. One worker is working for the highest rated firm in terms of the environmental pillar of the MSCI ESG rating and the other in one of the peer firms. The best firms in terms of MSCI's environmental score pay about 2.1% lower wages. We repeat this analysis in column (2) by restricting the sample to "generic occupations", i.e., occupations that are most likely independent of an industry. Examples of such occupations include, but are not limited to, secretaries, lawyers, human resource specialists, or IT managers. We calculate "generic occupations" by calculating the concentration of an occupation with respect to 3-digit industries, i.e., we compute the corresponding Herfindahl–Hirschman index (HHI). We code an occupation as "generic" if the HHI is below 10%. Focusing our analysis on generic occupations addresses the concern that (i) specific occupations and industries may be interlinked and cannot be separated (e.g., think of a nurse and the medical sector) and (ii) that workers in more sustainable firms may have fewer outside options, possibly affecting wages.[13] Interestingly, the point estimate is even bigger when restricting the sample to generic occupations: -4.4%.

In columns (3) and (4), we include the "social pillar" and the "governance pillar" of the ESG rating as additional controls, addressing the concern that more environmentally sustainable firms in a sector are perhaps also more likely to offer other non-wage benefits. Indeed, workers might form beliefs regarding a firm's likelihood of offering other job amenities depending on a firm's environmental policies and it is important to control for these. While the point estimates remain largely unchanged for the environmental dummy in column 3 (-0.021 vs -0.021 and -0.044 vs -0.039), results are not or less statistically significant, respectively. This is likely to be driven by the positive correlation of the different

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[12] If we broaden the definition of industries to the two digit-level, there are, on average, four firms in an industry-year cell. We report basic tests on the two-digit industry-level as well but use the tighter definition at the three digit-level as our main specification.

[13] Please note that this concern is more relevant in our later tests that use sector-level definitions of sustainability. In this section, we compare workers within the *same* sector. Nevertheless, the general concern might also translate to the firm-level analysis if certain occupations are more likely to exist in more sustainable firms.

pillars and power issues given our relatively small sample of firms. The coefficient on *Social (high, 3d)* is small and non- significant. Theoretically, the correlation between the social pillar and wages is ambiguous. On the one hand, workers might be willing to give up parts of their wage to work for a company that is doing well in terms of social policies (e.g., does not engage in child labor). On the other hand, the S score could explicitly include (expected) wages.

The governance pillar appears to be economically more important, and also statistically more significant. The point estimate is 0.010 and 0.032, respectively, suggesting that well-governed firms pay higher wages. While we cannot be affirmative, we do *not* believe that the higher wages for firms with better governance are driven by a preference channel (i.e., preferences *against* good governance). It is more likely, that other mechanisms explain this association. For instance, we know from a large literature on corporate governance that good corporate governance is associated with higher firm performance (e.g., Gompers Ishii, and Metrick, 2003 or Bebchuk, Cohen, and Ferrell, 2009), maybe because good governance is causing high performance (Cunat, Gine, and Guadalupe, 2012) or maybe because of omitted variables or reverse causation (Hermalin and Weisbach, 1998; Adams, Hermalin, and Weisbach, 2010). In any case, the positive association between the G component of the ESG score and the wages might be reflective of the high performance of firms with high governance ratings.

In specifications (5) and (6), we change the granularity of the industry classifications (2-digits compared to 3-digits of before). In specification (5), we only broaden the peer group definition to 2-digits and by doing so we include additional control firms as well. In specification (6), we use 2-digit peer firms but keep the same sample of firms as in our main specifications. The coefficient estimates are very similar in magnitude, and if anything, standard errors are slightly smaller, which seems intuitive given that we have more power in these regressions given that the sample increases.

Overall, the evidence using a firm-level best-in-class measure of the quality of a firm's environmental policies is consistent with the main hypothesis of the Sustainability Wage Gap. An important implication of the firm evidence of this section is that firms can attract talent at lower wages by investing into environmentally friendly policies, and thus might be able to "do well by doing good."

5.2 How do wages react to negative ESG shocks?

In the next set of tests leveraging firm-level ESG data, we use data capturing negative ESG incidents from RepRisk. The data is available for nine years, i.e., between 2007 and 2015 and for a mix of public and private firms. Panel A of Table 2 shows that we have on average about 190 firms per year (1,708/9) for which the RRI measure is available. We define a dummy which identifies firm-years with a positive change of that index, which we denote as *Negative ESG news (d)*. We see that approximately 23% of the firm-year observations are subject to positive increases in the index, i.e., negative ESG related news. Given the shock nature of the variable, we are interested in examining if increases in the RRI measure are associated with *increases* in wages. Hence, we use wage changes (difference of log wages) of individual workers as the dependent variable. Consistent with the Sustainability Wage Gap channel,

Panel C of Table 2 shows that wages increase in years following positive shocks to the RRI (i.e., shock induced deterioration of a firm's ESG profile) by 6.8%. Please note that our wages include bonus payments as well. In other words, firms adjust wages upwards after they are hit by negative ESG news, which is consistent with the view that they need to pay higher wages to attract and retain workers given that their ESG performance has deteriorated. In those tests, we keep the worker-firm match constant and focus of wage changes of workers who stay in the same firm, mitigating the concern that wages are directly affected by changes in the allocation of workers due a deterioration of firm-level ESG quality (see Colonnelli et al. (2023)).

While existing research suggests that negative ESG-related news are associated with *lower* future firm performance (see, e.g., Krüger, 2015 or Derrien et al., 2023), the opposite might be true as well (at least in the short-run, using accounting-based measures).[14] To be specific, there is the concern that some firms might have engaged in unethical or environmentally damaging behavior or policies that could have led to higher profits and, at the same time, triggered the negative ESG shock. The increase in profits could then also explain the increase in wages. Hence, in columns (2) and (3), we control directly for changes (and lagged changes) of log of value added over total assets. The coefficient on changes in value added is close to zero and not significant when analyzing contemporaneous changes and positive and significant when considering lagged changes. Most importantly, the coefficient on the ESG shock remains largely unchanged in these additional specifications.

5.3   Is there heterogeneity in the Sustainability Wage Gap?

Last, we provide some evidence in support of Hypothesis 2, i.e., that the Sustainability Wage Gap is larger for workers who are more skilled. However, we consider this evidence merely suggestive due to the limitations of our data (i.e., the relatively small sample of firms for which ESG ratings are available). We test and discuss this hypothesis (together with Hypotheses 3 and 4)[15] more rigorously in the next section where we use sector-wide measures of sustainability allowing us to employ the full population of Swedish workers, over a longer period.

As discussed in Section 3, there exists substantial heterogeneity among workers with respect to preferences towards sustainability. Our survey suggests that more skilled people care more about the environmental aspects of their jobs. In our analysis, we quantify skills by using both measures for cognitive and non-cognitive skills. Compared to using the achievement of a university degree as a crude measure of skill, an advantage of the skill-based talent measures is that they are sufficiently detailed to allow analysis of the upper percentiles of the skills distribution. Another benefit of these detailed skills measures is that they are comparable over time since the distributions in the population are the same across

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[14] Temporary higher accounting profits (or value added) due to unsustainable behavior can still lead to a lower market value if investors expect lower profits in the future.

[15] Please note that we are unable to test Hypotheses 3 and 4 in this sample due to the short time-series component of the data and the lack of overlap with the Labor Force Survey (LFS) which includes our main measure of effort (number of hours worked per week).

cohorts.[16] Moreover, it has been documented that especially non-cognitive skills have been of growing importance in the workplace (see Deming 2017). We define dummy variables *Cog89 (Noncog89)* that are equal to one if cognitive skills (non-cognitive skills) are either 8 or 9, corresponding approximately to the top 10% of workers according to the skills distributions in the whole population.[17]

Panel D of Table 2 shows the results. Specifications (1) to (3) analyze the heterogeneity of the Sustainable Wage Gap with respect to non-cognitive skills, while specifications (4) to (6) with respect to cognitive skills. The specifications differ by the granularity of the included fixed effects. Specifications (1) and (4) include industry-year fixed effects, specifications (2) and (5) add occupation-year[18] fixed effects, and specifications (3) and (6) include firm-year fixed effects. In all specifications, the point estimates of the interaction terms between the best-in- class dummy and the skills measures are negative, and, hence, in line with Hypothesis 2. However, the estimates are mostly statistically insignificant. Thus, those results need to be interpreted with caution and should be treated as being merely indicative. We will revisit this hypothesis in the next section, employing the full sample of the Swedish work population allowing for higher-powered tests.

6 The Sustainability Wage Gap II: Do firms in sustainable sectors pay lower wages?

In the previous sections of the paper, we used commercially available ESG data to construct measures of sustainability at the firm-level. In this section, we will now move to sector-level measures of sustainability allowing us to employ the full population of Swedish firms and workers. As described in Section 4, we use a survey-based sector-level measure of sustainability as our baseline, but we will also make use of a sector classification that is based on greenhouse gas emissions.

While using firm-level ESG data has several advantages, it also comes with limitations. On the positive side, using firm-level ESG ratings (compared to sector-level measures) allows us to compare workers within the same sector, alleviating concerns that the sector-wide measures of sustainability may capture other sectoral differences, unrelated to sustainability. Indeed, the tests based on firm-level ESG ratings and ESG news shocks compare firms within the same sector, with different ESG ratings. The analysis using ESG-related news

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[16] As pointed out by Böhm, Metzger, and Strömberg (2023), using educational attainment as a proxy for talent is problematic in time-series comparisons. Due to a large expansion of education, the cohort of university graduates has increased sharply over the last decades, resulting in a substantial decline of average talent in the group of university graduates. For instance, as shown in Böhm, Metzger, and Strömberg (2023), during 1990–2014, post-secondary attainment rose from 21 % to 37% accompanied by a decline in average cognitive ability of more than a fifth of a standard deviation in the working population.

[17] Note that the in the firm sample skills, especially cognitive skills, are higher compared to the general population.

[18] We employ Swedish Standard Classification of Occupations (SSYK) at its finest level (*Ssyk4*, 4-digit), which corresponds to 354 unique occupations.

shocks compares workers within the same firm before and after salient episodes of deterioration of a firm's ESG policies.

However, using our sector-based measure has important advantages. First, the sustainability of sectors (compared to individual firms) can be easily assessed and judged by potential employees. Second, the methodology we used for the assessment of the sustainability of economic sectors is transparent. The interpretation of commercially available ESG ratings, on the contrary, is not always straightforward: such ratings are complex, their methodologies are often opaque ("black box"), and the ratings rely to a large extent on self-reported data by firms. Third, there is increasing evidence of relatively low correlations between the ESG ratings from different data providers (see Gibson, Krueger, and Schmidt 2021 or Berg, Koelbel, and Rigobon 2022). Fourth, recent research has also documented changes to the historical ratings by some ESG data providers (Berg, Fabisik, and Sautner 2021). Fifth, historic data on firm-level ESG ratings are available for publicly listed firms only, with the data often being available only for a relatively small number of years, which restricts the sample in both the time-series and the cross-section. In contrast, our survey-based measure allows us to cover firms representing 98% of Swedish private-sector employment and is more likely to capture the perceived sustainability of firm. Moreover, using the survey-based measure allows us to complement the worker data with information from a large labor force survey including information on working hours which we use as a proxy for effort. In particular, the latter points allow us to test Hypotheses 2 to 4, which was not (or only partially) feasible using firm-level ESG data.

6.1 Do more sustainable sectors pay lower wages?

To test the hypothesis that workers are willing to work for lower wages in more sustainable sectors, we again run standard Mincerian wage regressions augmented by an indicator variable capturing the environmental sustainability of the sector of employment of the individual. The dummy variable *Sustain. (high)* equals one if the sector belongs to the top sustainability quintile of all sectors, either based on our survey measure or based on sector-level greenhouse emissions. To set the stage, we estimate in Panel A of Table 4 the Sustainability Wage Gap for a selected set of occupations which exist in virtually all sectors (e.g., receptionists and secretaries, human resource professionals, or accountants, among others) using the survey-based measure of sustainability. The estimates show sustainability wage gaps ranging from about -7.0% for IT professionals to -16.2% for legal professionals. These regressions also include residential municipality-year fixed effects addressing the concern that more sustainable sectors might be clustered in regions with cheaper living costs, for instance.

In our main regression analysis (see Panel B, Table 4) we use the full sample of occupations as well as our more systematic approach to define "generic occupations", i.e., occupations that virtually exist in all sectors[19] [19]. Focusing our analysis on generic occupations addresses the concern that specific occupations and industries may be

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[19] Please refer to Section 5.1 on how we define generic occupations.

interlinked and cannot be separated, like for instance nurses and the medical sector. Please note that, although we control for education and experience, there is the concern that other omitted factors explain why workers or occupations in more sustainable sectors are less productive. For instance, education is a very broad measure of ability and there might be considerable variation among university graduates. Hence, like before, we also control for cognitive and non-cognitive skills from military enlistments tests. These measures have been found to be highly informative for labor related outcomes and (see Lindqvist and Vestman 2011 or Böhm, Metzger, and Strömberg 2023). We also include occupation-year fixed effects controlling for occupation-specific, time-varying heterogeneity. Hence, we compare two otherwise very similar workers, in the same occupation, located in the same municipality, in the same year who work in a sustainable versus an unsustainable sector.

Consistent with Hypothesis 1 (and the firm-level evidence presented before), Column (1) in Panel B of Table 4 shows that male workers in generic occupations earn about 12.6% less if they work in sectors considered to have high environmental sustainability.[20] To explore the functional form of the relation and possible non-linearities, we split, in Column (2), the continuous variable into quintiles. This analysis reveals two interesting facts: (i) the wage difference is growing (in absolute terms) almost monotonously; (ii) the results are mostly driven by the highest rated sectors (and to a certain extent by the sectors that are least sustainable). For instance, in Column (2) we see a sizeable difference between the least sustainable sectors (the omitted category) and the sectors in the middle of the distribution (-0.024 to -0.055). We then observe another, even bigger, jump between the most sustainable sectors and the other ones. The point estimate for the dummy identifying the most sustainable sectors is -0.159, suggesting a jump of about 10 percentage points between the most sustainable sectors and the sectors in the second most sustainable category.

In specifications (3) and (4), we include all occupations in the estimation. The results remain qualitatively unchanged, the point estimates are slightly smaller though: on average, workers in more sustainable sectors earn about 8.7% lower wages.

We believe that our survey-based measure of sustainability captures the *perceived* sustainability of a sector best. However, a dimension that is likely to be increasingly relevant for workers making job-related decisions is a sector's climate impact through GHG emissions. Hence, we also make use of an "objective" or "scientific" measure of sector-wide sustainability. We base this measure on sector level greenhouse gas emissions scaled by employees. Specifications (5) and (6) in Panel B of Table 4 show the corresponding tests using that measure, in which the dummy variable *Sustain. (high)=1* identifies the sectors with the lowest greenhouse gas emissions. Note that GHG emissions are not available for all industries, and we end up with a smaller sample. Workers in industries that exhibit the lowest greenhouse gas emissions earn on average 5.7% lower wages compared to workers in the other industries. Allowing for non-linearities and using quintile dummies, we also see monotonically decreasing wages when moving from industries with relatively high

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[20] We cluster standard errors at the firm-level. In Online Appendix Table A.2, we take several alternative structures for the error terms into consideration. Our results remain robust to various ways of clustering.

greenhouse gas emissions to industries with low levels: workers in the quintile with the lowest level of greenhouse gas emissions (*Sust. quintile = 5*) earn about 12.4% lower wages compared to otherwise similar workers in sectors that fall in the quintile with the highest level of greenhouse gas emissions.

To evaluate how plausible it is that workers are willing to forego parts of their salary to work for environmentally sustainable employers, some benchmarking might be informative. We compare our estimated Sustainability Wage Gap to wage gaps in other professions which are known for employing workers who are mission-/purpose-driven. To be concrete, we contrast the Sustainability Wage Gap with wage gaps of (i) social workers and (ii) teachers in Sweden.

The estimated wage gaps (after controlling for standard Mincerian controls, cognitive and non-cognitive skills, and location) are -28.7% for teachers and -18.7% for social workers.[21] The Sustainability Wage Gap is -13.3% when comparing workers in firms in the quintile of the most sustainable firms to otherwise similar workers in the quintile of the least sustainable ones (it is -8.7% when comparing workers in the quintile of the most sustainable firms to the remaining ones). In relative terms, the sustainability wage gap is between 46% to 71% (30% to 47%) of the teacher and social worker wage gap. To further gauge the plausibility of the estimated magnitudes, we can also compare the Sustainability Wage Gap with the gender wage gap. The latter turns out to be -13.5% in our sample. Depending on which estimate used (Column 3 or 4, Panel B, Table 3) the sustainability wage gap corresponds to 64% (100%) of the gender wage gap. Overall, the magnitude of the sustainability wage gap does not seem to be unplausible. While the Sustainability Wage Gap is substantial in absolute terms, it is smaller than the wage gap of teachers or social workers, and of similar size when compared to the gender wage gap.

As a last test, we combine the survey-based measure with the measure that is based on greenhouse gas emissions by interacting both. Specification (7) (See Table 4 Panel C) shows the results. The Sustainability Wage Gap is biggest if both measures agree that a sector belongs to the top quintile of the corresponding sustainability distribution. Workers in those sectors earn 11% lower wages compared to otherwise similar workers in sectors which both measures consider non-sustainable (baseline category). The Sustainability Wage Gap is about 9.9% (4.7%) if only one of the measures, the survey-based (emission-based) measure considers a sector sustainable. As explained in Section 4.1.4 the two measures differ in a few important dimensions which can also explain the differences in the wage gap. First, the emission-based measure ignores other non-greenhouse emissions such as chemical waste. As an example, the manufacturing of rubber and plastic products is considered sustainable using emission data, but survey participants classify it as non-sustainable. Second, while the emission-based measure might be more scientific and objective, it is the *perceived* sustainability that is likely to matter most for workers' labor decisions. Consequently, we use the survey-based measure as our baseline but "replicate" and report key analyses with the

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[21] Please note that the estimated Swedish teacher wage gap is comparable to the U.S. For instance, the Economic Policy Institute provides evidence that the relative teacher wage penalty in the U.S. was 35.2% for men in 2021. Including women, the wage penalty was 23.5%.

emission-based measure in Online Appendix Table A.2.

6.2 What happens to wages of workers who move across sectors?

One advantage of the sector-level measure of sustainability is the broader coverage of workers, which allows us to track workers over time and across firms. The richer data allows to exploit within-worker variation, analyzing job changes across sectors. In Column (1) of Table 5, we include worker fixed effects. The coefficient of working in a high sustainability sector is -5.6%, a bit smaller than the OLS results but still very sizeable. One concern with this specification is that it implicitly assumes that workers randomly move between firms and sectors. This assumption is unlikely to be true in general and is particularly difficult to defend in our setting. The (timing of) job changes across different sectors might be correlated with some time-varying characteristics of workers such as expected changes in household compositions or changes of preferences (e.g., due to a "midlife crisis"). We discuss the issue that job changes are non- random and predictable using important life-events in Section 5 of the Online Appendix. Specifically, the analysis shows that workers are more likely to move into *unsustainable* sectors when getting married or becoming parents and are more likely to move into a more *sustainable* sector around a divorce.

However, we partly address the concerns that moves between firms and sectors are not random by looking at "more" exogenous job changes. We focus on workers who had to change jobs because of their firms went bankrupt in the previous year (see Columns (2) and (3), Table 5) or because their firms experienced a massive layoff of more than 75% of their workforce (see Columns (4) and (5), Table 5). We analyze the wage changes (difference of log wages) of those workers by comparing the wage the worker received in the job he got laid off from and the wage he received in the new job. This means that we condition on workers who lost their job but had a smooth transition to the next job. Please also note that while the timing of changing jobs is reasonably exogenous, the decision which sector to join is endogenous and might still depend on time-varying omitted variables. We regress the wage changes on a variable that measures the changes in the sustainability of the firms between which the worker is switching. The variable takes the value of 1 if a worker moves from an unsustainable firm to a sustainable firm, the value of -1 if the worker moves from a sustainable firm to an unsustainable one, and the value of 0 if the level of sustainability remains the same. We denote this variable as *Ch. in sustainability* We also analyze increases/decreases in terms of sustainability using separate dummy variables. Columns (2) and (4) of Table 5 show that moving to a more sustainable (unsustainable) sector is, on average, related with a wage decrease (increase) of 4.3 − 6.5%. This holds for workers who changed jobs because their company went bankrupt (column 2) or underwent a mass layoff (column 4). When we investigate increases/decreases separately (columns 3 and 6), we observe that workers who move to more sustainable firms afterwards, experience a wage decrease of between 6.1 − 7.4% relative to workers who moved across firms of similar sustainability (omitted category). Workers who move to firms in less sustainable sectors, on the contrary, experience a wage increase of 2.4 − 4.9% relative to the omitted category. Overall, our switcher analysis shows robust evidence that workers in more sustainable firms earn less, exploiting within-worker variation.

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6.3 The Sustainability Wage Gap for highly educated workers and its evolution over time

As discussed in Section 3, we hypothesize that there exists substantial heterogeneity among workers with respect to preferences towards sustainability (Hypothesis 2) and over time (Hypothesis 3). Indeed, our survey suggests that more skilled people care more about environmental aspects of their jobs, and we have documented suggestive evidence using firm- level measures of sustainability in Section 5.3 (see Table 2, Panel D). These hypotheses lead to additional predictions, which we can test in our administrative data. We believe these tests are informative and important for at least three reasons.

First, they are helpful in terms of more credibly identifying the effect of sustainability on wages as any alternative explanation would also need to explain possible heterogeneity in the effect. For instance, if firing risk or hazardous work conditions were driving the results, it remains unclear why higher educated workers would be more affected by those. If anything, one would expect that higher educated workers could more easily find a new job or have white- collar jobs that expose them less to hazardous work conditions. Moreover, it remains unclear and would need to be explained why alternative channels such as firing risk or hazardous work conditions are becoming more important over time. Second, econometrically speaking, the tests exploiting cross-sectional worker heterogeneity are important because we can include firm-year fixed effects in some of our tests, addressing the concern that time-varying unobserved variables (e.g., profitability) at the firm-level explain our findings. Third, if preferences towards sustainability were indeed more relevant for younger cohorts, our findings are expected to become even more important for firms in the future. Younger cohorts (e.g., Generation Y (Millennials) and Generation Z) have entered the labor market and are climbing up the corporate ladder and, hence, accommodating their preferences might become increasingly important for firms to attract and retain the most skilled workers. In other words, given the generational changes in the composition of the worker population our analysis carries policy implications of increasing relevance in the future.

In the analysis exploiting heterogeneity, we again quantify skills using our cognitive and non-cognitive measures. In Table 6, we examine differential effects for groups with different levels of skills, and also explore time series variation in these effects. Columns (1) and (2) of Panel A test whether there are differences in the Sustainability Wage Gap for high vs. low-skilled workers. Given that there are workers with different levels of skills within the same firm-year, we can now also include firm-year fixed effects in our specifications, absorbing any time-varying firm-heterogeneity.[22] We define dummy variables *Cog89* (*Noncog89*) that are equal to one if cognitive skills (non-cognitive skills) are either 8 or 9, corresponding approximately to the top 10% of workers according to the skills distributions. Please note that we estimate positive and sizeable coefficients for the main effects of skills. The interaction term between the dummy variable identifying high-skilled individuals in terms of

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[22] We obtain consistent results when we use firm fixed effects instead of firm-year fixed effects.

cognitive skills *(Cog89)* and sustainability (*Sustain. (high)=1*) is -1.6%, suggesting a larger Sustainability Wage Gap (in absolute terms) for the most highly skilled individuals (see Column 1). In a similar spirit, the interaction between the sustainability dummy and high non-cognitive skills is -1.0% (see Column 2). Summing up, the evidence is consistent with Hypothesis 2, which states that the Sustainability Wage Gap is more pronounced for more skilled workers.

In Column (3), we investigate whether, as stipulated in Hypothesis 3, the documented Sustainability Wage Gap is indeed increasing over time. To test this hypothesis, we interact our sustainability dummy with time dummies for the periods 2001-2004 (omitted), 2005-2008, 2009-2012, and 2013-2017. The interaction terms are negative and increasing in absolute terms over time, implying that the Sustainability Wage Gap is increasing by about 2 percentage points per decade.

Given our previous findings and the growing importance of skill (especially, of non-cognitive skills (see Deming 2017), we also test whether the wage gap for the most skilled workers is higher in more recent periods. To this end, in Panel B of Table 6, we include besides the main effects, double and triple interaction terms between skills, our sustainability dummy, and the time period indictors. For space reasons, we only show the coefficients of the triple interaction terms. We document significantly negative estimates on the triple interaction terms, both for the cognitive skills measures (Column 4) and the non-cognitive measures (Column 5). For cognitive skills the effects are monotonously increasing over time, suggesting that the wage gap has become more important recently. We observe a similar pattern, albeit less monotonous pattern, for non-cognitive skills. Overall, the evidence is consistent with the intuitive notion that the Sustainability Wage Gap for the most skilled people has grown over time.

Taken together the results of Table 6 are supportive of the hypotheses that more skilled workers have stronger preferences toward sustainability and are willing to accept lower wages and that these effects are growing over time. These findings increase our confidence in a causal interpretation of the Sustainability Wage Gap as any alternative explanations would need to explain these documented heterogeneities as well. For instance, why would the Sustainability Wage Gap for the most highly skilled people increase over time? Importantly, from an identification perspective, the tests in Table 6 also allow us to include firm-year fixed effects, controlling for time-varying, unobserved variables at the firm-level such as profitability, for instance.

7 Interpretation and alternative explanations

In this section, we would like to take a step back and discuss potential interpretations and alternative explanations for our findings.

First, the decision for working in more sustainable firms or sectors might be driven by intrinsic preferences, considering work as a *source of meaning* (see Cassar and Meyer, 2018). It might also be the case that preferences for working in sustainable firms or sectors

is driven by external rewards within society, i.e., working in those types of firms or sectors comes with some kind of *status* or prestige. While some of our results on effort[23] hint towards an intrinsic motivation (if one believes that working hours are not perfectly observable for outsiders), we are generally agnostic regarding those two interpretations as (i) they are likely to be non- mutually exclusive and (ii) our setup does not allow to clearly disentangle the two.

Second, we would like to note that ex-ante it is not clear whether meaning/status of a job and monetary compensation are substitutes or complements. It might even be the case that low pay increases the status of a sustainable job.

Third, there is a large literature in financial economics suggesting different channels through which sustainability or more generally ESG policies can affect financial performance: increased cash flows, lower discount rate, or a generally larger "corporate pie" to be shared between all stakeholders (see Edmans 2020). Moreover, reverse causation, i.e., well performing firms being more able to invest into improving ESG policies, appears also consistent with most evidence presented in the previous literature. All those channels may also affect wages. However, most of those alternative channels would predict higher wages (or at least not lower wages) for workers in high ESG industries or firms and, in the case of risk reduction, they are not consistent with our heterogeneity results or additional tests.[24]

Fourth, a remaining source of concern with our analysis could be that heterogeneity at the worker-, job-, or industry-level might explain our findings. As discussed before (in the Introduction and the Literature Review), we would like to remark that even if there was random assignment of ESG policies to firms, it would still remain unclear to what extent changes in the worker value alignment drive changes in labor outcomes and to what extent those changes might be driven by other (expected) changes at the firm-level. For instance, changes in ESG policies may indeed affect firm profitability with direct implications for wages or retention.

The evidence presented so far allows us to rule out most of the alternative explanations presented above. We made use of our detailed administrative data to control for worker characteristics that are expected to be correlated with productivity: on top of standard Mincerian controls, we controlled for detailed cognitive and non-cognitive skills measures from military enlistment tests, variables that have been found to be highly informative in explaining labor market outcomes (see Lindqvist and Vestman, 2011 and Dal Bo et al. 2017, for instance). Moreover, using firm-level ESG ratings we have compared workers of firms within the same 3-digit industrial sector, working in the same 4-digit occupation. We also analyzed job switchers and exploited shocks to the sustainability of firms using negative news events, keeping the worker-firm match constant. Moreover, in the sector-level tests,

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[23] See Section 7.1 where we document that workers in more sustainable sectors do work more (not less) actual hours per week.

[24] In Section 6 of the Online Appendix, we discuss those potential alternative explanations in more detail. Moreover, in unreported tests, we also find that firing rates of workers in more sustainable sectors are *not* lower as expected if risk was driving the results.

exploiting heterogeneity in workers' preferences for sustainability, we compared workers within the same firm and year and showed that the Sustainability Wage Gap is more pronounced for more skilled workers and increasing over time. Any alternative explanation *would need to explain those heterogeneities as well.*

In a last set of tests, we aim to directly test two specific alternative explanations that—at first—appear consistent with the presented evidence so far. Sustainable firms or sectors may provide a better work-life balance or better career opportunities (e.g., by allowing workers to build up relevant human capital). Broadly speaking there is the concern that the "E" pillar (our measure of environmental sustainability) is highly correlated with certain elements of the "S" (and "G") dimension of firms' ESG policies such as policies related to work-life balance or career opportunities. Indeed, an ESG component of a sector sends a signal to workers about other dimensions of that firm or job as well. Even experimental studies that apply random assignment of ESG to firms but do not fix the other dimensions do not address this issue. We address those concerns in two steps:

First, we conduct two analyses to explicitly test the hypotheses that the Sustainability Wage Gap is driven by better work-life balance or by better career opportunities in more sustainable firms or sectors. While *Hypothesis 4* of the "Preference channel" predicts longer actual working hours, i.e., hours actually worked which may be different from the workload agreed in the contract, an explanation based on better work-life balance would predict the opposite. We can directly test those competing hypotheses. Moreover, making use of the long time-series dimension of our panel, we can also directly test whether working in more sustainable firms or sectors leads to better career opportunities over the lifetime of the workers. In those tests, we also further leverage the survey data collected through Prolific. In the survey, we explicitly ask the respondents to characterize sectors in terms of other dimensions related to compensating differentials. Similar in spirit to our sector-level sustainability classifications, each survey respondent was asked to rate ten randomly selected sectors in terms of issues such as whether working in the sector would, for instance, allow for good work-life balance or for good career opportunities (see Section V of the survey instrument in Online Appendix Section 4 for further background). In our tests, we include those sector-level assessments (or ratings) as additional controls.

In a second series of tests, we conduct additional implicit tests by including our set of sector-level assessments alongside our main sustainability measure in Mincerian wage regressions as explanatory variables. Running these "horse-race" type regressions allows us to further rule out alternative explanations.

7.1 Do workers in more sustainable sectors work harder? Work-life balance considerations.

We now examine the hypothesis that workers in more sustainable sectors are *Willing to work harder* (*Hypothesis 4)*. Importantly, this test will also directly address the competing hypothesis that the Sustainability Wage Gap is driven by a better *Work-Life balance* explanation. In our tests, we make use of a labor force survey (LFS) which provides data on actual hours worked per week. Please note that the data is only available for a smaller sample

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and cannot be matched with the other administrative data. This means that we cannot control for cognitive and non- cognitive skills in those tests. We focus on workers with full-time employment. Column (1) of Table 7 shows that workers in more sustainable sectors do *not* work less than workers in unsustainable sectors. Indeed, the estimates suggest that these workers work 0.3-0.4 hours per week *more* – economically, this number is relatively small though. Analyzing the distribution of working hours, we also analyze whether workers in more sustainable sectors are more likely to work extreme working hours per week (i.e., more than 50 or 60 hours per week). Columns (2) and (3) show that this is indeed the case. Workers in more sustainable sectors are more likely to work more extreme hours. The likelihood of working more than 50 hours (60 hours) is 1.4 percentage points (1.6 percentage points) higher than for workers in more sustainable sectors. These effects are economically sizeable, especially for working very extreme hours of 60h or above. Workers in more sustainable sectors are about 25% more likely to work more than 60 hours compared to workers in unsustainable sectors. In specifications (4) to (6), we include our sector survey-based proxies for work-life balance and career opportunities. Reassuringly in these specifications, the coefficients of working in more sustainable sectors *increase* for all outcomes, mitigating the concern that more sustainable sectors provide a better work-life balance. The coefficient identifying sectors with high work-life balance (i.e., *Work-life (high, 3d)*) is negative and, economically, in the same ballpark (with opposite sign) as the dummy identifying the sectors with the highest sustainability. Interestingly, workers in sectors with high career opportunities tend to work less as well. However, even though the coefficients for the career opportunities dummy are statistically significant, economically they are orders of magnitude smaller.[25]

Overall, we find direct support for the hypothesis that workers in more sustainable sectors are willing to work harder, consistent with Hypothesis 4. Those findings also directly address the concern that the Sustainability Wage Gap is driven by a better work-life balance.

7.2   Do sustainable sectors provide better career opportunities?

Another concern might be that more sustainable firms or sectors provide better training or, more general, better career opportunities. Indeed, workers in more sustainable firms or sectors may be willing to give up some parts of their wage early in their career to earn higher wages later. In other words, while there is a wage gap early on in their career, the present value of their lifetime income is higher. To test this competing hypothesis, we make use of the long time- series dimension of the data and test directly whether the wages of workers who started working in a sustainable firm or sector early on are indeed catching up and are higher at a later stage in the career.

In columns (1) to (4) of Panel A of Table 8, we test whether the wage gap is different for different age groups, i.e., we restrict our sample to workers of age 30, 40, 50, and 60. While

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[25] One concern is that our measure of career opportunities is not very informative. In general, it is not entirely clear that sectors with better career opportunities necessarily require longer working hours. Indeed, such sectors may provide better training or opportunities to build relevant human capital. We will show in subsequent tests that our measure of career opportunities is indeed related to higher wages (increases).

there are some differences across age groups, the overall picture remains. Workers in more sustainable sectors earn substantially lower wages at all ages. The point estimates vary between

-6.3% and -11.4%. However, it might be the case that workers build up relevant human capital that is (more) valuable in other sectors. We explicitly test for the possibility by following cohorts of 30-year-olds over their careers, that is we test how starting working in relatively more sustainable sectors affect wages of those workers when they are 40 or 50 years old. Importantly, we look at their wages irrespective of the sector they are working in at a later age. For instance, in Column (7) we analyze wages of 50 years old workers depending on whether they started their career in a sustainable sector (proxied by the sector they were working in at age 30). We find that the wage gap remains relatively stable over the lifecycle of the worker and, at age 50, there is still a sizeable wage gap of about 7.7%. Please keep in mind that in those types of tests, any age effect is contemplated by cohort effects as well.

One version of career opportunities as an alternative explanation is connected to working for a startup. Startups often pay lower salaries but compensate workers with equity or stock options.[26] It might be the case that startups are overrepresented in sustainable sectors. Indeed, climate and sustainability has been in the public and policy focus for a long time (e.g., UN Framework Convention on Climate Change of 1992 or the Kyoto Protocol of 1997) and might have stipulated entrepreneurship in related sectors. To address that concern, we run robustness tests in which we exclude startups from the sample. Startups are approximated by firm age measured since registration. Panel B of Table 8 shows the results. The Sustainability Wage Gap remains largely unchanged if we exclude firms that are younger than 5, 10, or 20 years.

Overall, we do not find supporting evidence that workers of sustainable sectors have better career opportunities, compensating them for lower wages in more sustainable sectors (and early in their career).

7.3 "S", "G", and other compensating differentials

In a last series of analyses, we run a battery of implicit tests, analyzing to what extent other components of sustainability—i.e., the social "S" or governance "G" characteristics of a sector— may affect the Sustainability Wage Gap. Specifically, we now also use measures on other work- related dimensions at the sector-level, which we collected using our survey. Examples of other dimensions are, for instance, the job security or physical demandingness of the working in a sector. In Table 9, we include those additional controls in the wage regressions. In Column (1), we start by exploring the role of the perceived social responsibility of the sector in which a company operates and the sector's perceived corporate governance. The tests on the social responsibility of the sector also help to

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[26] While according to tax rules equity and stock options are taxable income as well and, hence, included in our measure, the valuation of those might be less transparent. For that reason, we take a conservative approach and drop potential startups in this robustness test.

connect our findings to the literature documenting that companies included in the list of the "Best companies to work for" (BC) outperform other companies (see Edmans, 2011 and Edmans, Li, and Zhang, 2023). The predictions of being a BC (or a firm being "socially responsible") on wages are ambiguous. First, a company might be voted a BC by its workers because it pays higher wages. In that case, lower wages in more sustainable sectors are thus inconsistent with the hypothesis that our measure of sustainability is a proxy for BC.[27] Alternatively, it might also be the case that firms end up on the list of "Best companies to work for" because their employees like working in more environmentally sustainable firms. That would be fully consistent with our hypothesis of the Sustainability Wage Gap. However, BCs may also treat their workers better in non-pay dimensions, allowing these companies to pay lower wages. For instance, they may provide employees with mentorship, skills development, opportunities to step up, or a great corporate culture. We have already tested for some of these alternative explanations to the extent that those dimensions are correlated with our measures of compensating differentials, and we tested the aspects of skills development and opportunities explicitly in the preceding section. When we examine how wages are related to the perceived social responsibility of the sector, we find evidence consistent with the view that otherwise similar workers earn about 1.4% lower wages in high responsibility sectors. However, the effect is much smaller than the Sustainability Wage Gap, which we estimate to be -12.4% in the same specification.

Firms in sectors with perceived good governance seem to pay 6.5% higher wages. This might be related to firms with good governance also being more profitable. Interestingly, when we relate wages to commercially available firm-level governance ratings in Section 4.1.1 of the paper we find similar patterns of wages being positively related to the governance ratings of the firms. Potentially, the similarity of the results across different measures for governance could be seen as a validation test for our survey approach to quantifying sustainability.

We also include measures of work-life balance and career opportunities as controls. In columns (2) and (3), we find—as expected—that sectors that are associated with a better work- life balance pay indeed lower wage (-2.1%), while sectors with better Career Opportunities pay 2.2% higher wages. Importantly, when we control for those two measures in Column (4), the point estimate of the dummy for highly sustainable sectors is -10.0%. As mentioned before, we also collected additional information on the perceived riskiness and physical demandingness of different sectors. When we control for those dimensions as well in Column (5), alongside the other sector controls, we still find that sustainable sectors pay about 11.6% lower wages. Other ratings have the expected signs and are at least one order of magnitude smaller.

As a last step, we calculate proxies for different compensating differentials at the industry- level. For instance, we calculate firing rates to proxy for sector-level firing risk. We calculate the average number of sick days and the propensity of ending up in the hospital

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[27] Interestingly, however, we do not find a positive correlation between "Best companies to work for" and being a highly sustainable company. When we compare "Best companies to work for" (BC) to the universe of the Swedish public companies, we document negative correlations between BC and sustainability.

as proxies for health risk or work-life-balance. Similarly, we compute marriage and divorce rates, the average number of children, and the number of parental leave days as further proxies for a good work- life-balance (see, for example, Liu et al., 2023). We then include those industry averages (and their squares) as additional sector-level controls in our regression. Column (6) of Table 8 shows the results. The coefficient on Sustainability is -6.9%, a bit smaller than in our baseline regression but still very sizable.

Overall, we conclude that the alternative interpretations discussed in this section are more difficult to reconcile with the full set of presented results. On the contrary, the results are fully consistent with the set of hypotheses derived from worker preferences toward sustainability and their heterogeneities.

8 The Sustainability Wage Gap and corporate financial performance: Back of the envelope calculations

One of the contributions of our paper is to argue that the Sustainability Wage Gap can have important implications for a firm's FCFs and thus shareholder value as labor costs can represent a sizeable fraction of total costs and are also often large when compared to a firm's asset base. For instance, in our sample, Swedish firms in the middle of the sustainability distribution have a ratio of labor to total expenses of 31.5% and a labor expense to total assets ratio of 52.3%. Labor expenses are defined as salaries to workers and executives plus social security expenses. The magnitudes of the ratios are comparable to firms in Compustat North America that report labor expenses between 2000 and 2019, for which we find a median ratio of labor to total operating expenses of about 36%. North American firms from high sustainability sectors according to our industry-level sustainability measure also have comparable ratios of labor expenses to total asset: for instance, firms from sectors such as Health Services (SIC2=80), Educational Services (SIC2=82), and Social Services (SIC2=83) exhibit labor expenses to asset ratios between 32% and 91%.[28]

To illustrate the potentially sizeable firm-level financial implications of the Sustainability Wage Gap, we now conduct several back-of-the-envelope calculations based on the insights from the functional form analysis in Table 4, Panel B, Column (4). The estimates suggest that the difference in the Sustainability Wage Gap between firms in the 3rd and the 5th quintile of the sustainability distribution (i.e., medium versus high sustainability firms) is about 10 percentage points (=0.133-0.037). Hence, the estimates imply that if a firm in the middle of the sustainability distribution moves to the top, the firm could possibly lower its wage bill by about 10%. The median ROA for firms in the middle of the sustainability

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[28] To calculate the labor cost ratios for firms in the Compustat North America database between 2000 and 2019, we use firms for which Compustat items sich (Historical SIC code), xopr (Total Operating Expenses), at (Assets), and xlr (Total Staff Expense) are available between 2000 and 2019. Recent work in finance (see Hartman-Glaser, Lustig and Zhang, 2019; Donangelo, 2021) has used Compustat item xlr to proxy for labor expenses.

distribution is 0.087. We calculate for each firm in the middle of the sustainability distribution the relative increase in ROA that would result from a reduction of labor costs by about 10%. The median of these relative increases is about 17.5% illustrating the sizeable firm-level financial effects of the Sustainability Wage Gap.[29] A second alternative to illustrate economic magnitudes is to calculate the expected decrease of ROA for a firm that is moving from the top quintile of the sustainability distribution to the middle quintile. The expected relative (absolute) decrease of ROA in this case would be about 22%. Note that firms in the top quintile of the sustainability distribution have higher ROA (partly originating from a lower asset base) as well as a higher fraction of labor costs to total costs (about 56%). Overall, these back of the envelope calculations illustrate that more sustainable firms benefit from lower labor costs. However, and as noted before, we cannot observe the net effects of the Sustainability Wage Gap on a firm's profits as we are unable to observe the direct costs associated with investments in more sustainable policies. This specific limitation is not unique to our setting but applies more generally to research concerned with firms' sustainability practices given that detailed firm- level measures quantifying the costs of improving sustainability do not exist.

9 Conclusion

In this paper, we hypothesize that workers value the environmental sustainability of their jobs and accept lower wages to work in more environmentally sustainable firms and sectors. Using administrative employer-employee matched data from Sweden and both firm-level and sector- level sustainability measures, we provide evidence that firms with better sustainability characteristics tend to pay lower wages. We coin this empirical regularity the Sustainability Wage Gap.

We argue that workers are willing to give up part of their financial compensation because they derive nonpecuniary benefits related to their preferences to work in more sustainable firms or sectors. Our survey evidence suggests that those preferences are more pronounced for highly skilled workers. Consistently, we document important heterogeneities in the Sustainability Wage Gap itself: we show that the wage gap is indeed more pronounced for workers that are more highly skilled and increasing over time. We also show that workers in more sustainable sectors (are willing to) work harder.

Providing a battery of additional tests, we argue that our results are difficult to reconcile with many alternative interpretations suggested in prior research. Among those, we explicitly test the alternative hypotheses that more sustainable firms/sectors provide better career opportunities or a better work-life balance.

The Sustainability Wage Gap carries important implications for firm value. While many

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[29] Alternatively, we can calculate the median of the absolute increase of ROA for those firms, which is 0.051. Comparing this to the median ROA corresponds to a relative increase of almost 60%. Given the substantial heterogeneity in ROAs and costs structures, we believe that reporting the lower number of 17.5% is more accurate and still very sizeable.

prior studies document a positive correlation between a firm's sustainability characteristics and its financial performance, few studies manage to identify actual mechanisms through which sustainability translates into higher financial performance. We believe to provide evidence of a specific mechanism through which sustainability can positively affect firms' bottom line, namely through lowering a firm's wage bill.

Our findings are particularly relevant for firms today as younger cohorts such as generations Y (Millennials) and Z are entering the labor market and climbing the corporate ladder. Accommodating the sustainability preferences of these younger workers—who arguably care more about sustainability aspects than preceding generations such as Baby Boomers or the Silent Generation—might be a decisive factor for firms to attract and retain the most skilled workers and hence remain competitive in the future.

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Tables

Table 1: Survey responses: Labor choices and wages

Panel A of the table summarizes responses to selected survey questions related to labor choices and wages. Dummy Question 7 is a dummy variable based on the responses to *Question 7 - How important is it for you that your job is environmentally sustainable?* Responses to Question 8 and 9 can take on values of 0 (No) and 1 (Yes). Responses to Questions 8a range from 0 to 100 %. Panel B shows mean difference tests, which test if responses to survey responses differ across skill levels. Skill is assessed using responses to the following two survey questions: *Question 5 - In high school, how was your academic performance relative to your classmates? Question 6 - Where did you rank in terms of your grades in high school.* The group *Top* contains responses from individuals who state that their academic performance in high school was much better than average or who state to have ranked in the Top10 percent in terms of their academic performance in high school (Question 6). We test if the average response to a selection of questions in Panel A differs for the group *Top* relative to the rest.

Panel A: Questions related to labor choices and wages

	Count	Mean	Median
<u>Dummy Question 7:</u> Dummy variable equal to 1 if the answer to Question 7 is either Very important or Important.	300	0.65	1.00
<u>Question 8:</u> Would you consider accepting a lower wage to work for a firm that is environmentally sustainable?	300	0.52	1.00
<u>Question 8a:</u> If yes, what is the maximum reduction in wage you would accept in order to work for environmentally sustainable ("green") firm versus an environmentally unsustainable ("brown") firm (from 0% to 100%)? (Conditional responding yes to Question 2)	156	19.60	15.00
<u>Question 9:</u> For the same wage, would you be willing to work harder for an environmentally sustainable ("green") firm versus an environmentally unsustainable ("brown") firm?	300	0.82	1.00

Panel B: Mean difference tests: Labor choices and wages by different skills/skills group

	Grade performance is at the Top 10% (Q6)			Academic performance is much better than average (Q5)		
	Top	Rest	Diff	Top	Rest	Diff
<u>Question 7:</u> How important is it for you that your job is environmentally sustainable?						
Very important or important	78.50%	61.70%	16.8**	77.10%	47.90%	29.2***
Very important	32.30%	21.70%	10.6*	26.30%	20.70%	5.6
<u>Question 8:</u> Would you consider accepting a lower wage to work for a firm that is environ. sustain?						
Yes	61.50%	49.40%	12.2*	54.20%	48.80%	5.4
	65	235		179	121	

Table 2: Firm-level ESG data (MSCI / Reprisk) and wages

This table shows summary statistics for the firm-level ESG data from MSCI and Reprisk, as well as regression results relating wages to firm-level ESG measures. Panel A displays summary statistics of the ESG data for each data provider. The sample period for the data runs from 2002 to 2017 for the MSCI data, and 2007-2015 for Reprisk. Panel B shows Mincerian-like wage equations in which we relate wages to the ESG ratings from MSCI. In Panel B we use best-in-class dummy variables that identify the firm with the highest ESG score in a given industry. In columns (1) and (2) the main independent variable is best-in-class dummy based on the environmental pillar score. Columns (3) and (4) also include best-in-class dummy variables based on MSCI social and governance pillar ratings. In columns (5) and (6), we change the level of granularity of the industry classification from three to two digits (in specification (6), we keep the same sample based on three digits as of before). All regressions include *Year-Occupation* fixed effects, which are based on the 4-digit classification *Ssyk4*, corresponding to 354 unique occupations. The regressions also control for skill using fixed effects based on categories of cognitive and non-cognitive skills. In Panel C, the main independent variable is a dummy variable that takes on the value of 1 if Reprisk's RRI exhibits positive changes. In Panel D, we interact the Best-in-Class dummy with variables marking the most skilled workers. *Cog89* (*Noncog89*) identify roughly top 10% of workers according to the skills distributions in the whole population. All variables are defined in Online Appendix Table A.1. Standard errors are clustered at the firm-level. ***, **, * indicates statistical significance at the 1, 5 and 10% level, respectively.

Panel A: Summary statistics

MSCI – Worker:	Obs	mean	sd	p10	p25	p50	p75	p90
Age	539,793	42.79	10.16	29.00	35.00	43.00	51.00	56.00
Schooling	539,793	12.65	2.35	10.50	10.50	12.00	16.00	16.00
Pot. Exp.	539,793	23.51	10.53	9.00	15.00	23.50	32.00	38.00
Cog. Skills	539,793	5.44	1.82	3.00	4.00	5.00	7.00	8.00
Cog. = 8 or 9 (d)	539,793	14%	34%	0%	0%	0%	0%	100%
Non-cog. Skills	539,793	5.33	1.64	3.00	4.00	5.00	7.00	7.00
Non-cog. = 8 or 9 (d)	539,793	9%	28%	0%	0%	0%	0%	0%
Ln(Wages)	539,793	8.22	0.54	7.77	7.96	8.17	8.47	8.79
Environ. (high, 3d)	539,793	45%	50%	0%	0%	0%	100%	100%
Social (high, 3d)	539,793	46%	50%	0%	0%	0%	100%	100%
Gov. (high, 3d)	539,793	42%	49%	0%	0%	0%	100%	100%

MSCI – Firms:	Obs.	mean	sd	p10	p25	p50	p75	p90
Environ. (high, 3d)	227	42%	50%	0%	0%	0%	100%	100%
Social (high, 3d)	227	41%	49%	0%	0%	0%	100%	100%
Gov. (high, 3d)	227	41%	49%	0%	0%	0%	100%	100%
Environ. (high, 2d)	400	37%	48%	0%	0%	0%	100%	100%
Social (high, 2d)	400	37%	48%	0%	0%	0%	100%	100%
Gov (high, 2d)	400	37%	48%	0%	0%	0%	100%	100%

Reprisk – Firms:	Obs.	mean	sd	p10	p25	p50	p75	p90
RRI index	1,708	4.06	7.46	0	0	0	5.25	16.5
ΔRRI index	1,504	0.79	6.28	-5.5	0	0	0	10.17
Negative ESG news	1,504	23%	42%	0%	0%	0%	0%	100%
Δln(Value added)	1,110	-0.03	1.09	-0.83	-0.23	0	0.19	0.72
Lag Δln(Value added)	933	-0.06	1.09	-0.9	-0.24	-0.01	0.17	0.71

Panel B: Sustainability Wage Gap (Firm-level, MSCI)

	Ln(Wages)					
	(1)	(2)	(3)	(4)	(5)	(6)
Environ. (high, 3d)	-0.021*	-0.044**	-0.021	-0.039**	-0.022**	-0.030**
	(0.012)	(0.017)	(0.015)	(0.018)	(0.009)	(0.013)
Social (high, 3d)			0.001	-0.004		
			(0.017)	(0.017)		
Gov. (high, 3d)			0.010	0.032**		
			(0.019)	(0.013)		
Schooling	0.034***	0.054***	0.034***	0.054***	0.031***	0.034***
	(0.004)	(0.003)	(0.004)	(0.003)	(0.005)	(0.004)
Potential Experience	0.050***	0.057***	0.050***	0.057***	0.048***	0.050***
	(0.006)	(0.004)	(0.006)	(0.004)	(0.004)	(0.006)
Pot. exp. (squared)	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	539,196	101,681	539,196	101,681	787,950	539,196
Peer-group			Ind3			Ind2
Sample	All	Generic	All	Generic	All	All (Ind3)
Occupation f.e.			Occ4 - Year			
Skills f.e.			Cog./Non-cog.			
R-squared	0.468	0.506	0.468	0.506	0.473	0.468

Panel C: Reaction of wages to (negative) sustainability news (Firm-level, Reprisk)

	ΔLn(Wages)		
	(1)	(2)	(3)
Negative ESG news (d)	0.068***	0.068***	0.065***
	(0.018)	(0.018)	(0.017)
ΔLn(VA/Assets)		-0.006	-0.004
		(0.010)	(0.008)
Lag ΔLn(VA/Assets)			0.236**
			(0.097)
Schooling	-0.001**	-0.001**	-0.001**
	(0.000)	(0.000)	(0.000)
Potential Experience	-0.010***	-0.010***	-0.010***
	(0.002)	(0.002)	(0.002)
Pot. exp. (squared)	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Obs	159,226	159,226	159,226
Sample		All	
Occupation f.e.		Occ4 - Year	
Skills f.e.		Cog./Non-cog.	
R-squared	0.059	0.059	0.061

Panel D: Heterogeneity of the Sustainability Wage Gap with respect to skills and time (Firm-level, MSCI)

	Ln(Wages)					
	(1)	(2)	(3)	(4)	(5)	(6)
Environ. (high, 3d)	-0.012	-0.019*		-0.012	-0.019*	
	(0.014)	(0.011)		(0.014)	(0.011)	
Noncog89=1	0.206***	0.137***	0.131***			
	(0.022)	(0.026)	(0.024)			
Noncog89=1 # Environ. (high, 3d)	-0.036*	-0.026	-0.021			
	(0.020)	(0.025)	(0.023)			
Cog89=1				0.099***	0.072***	0.067***
				(0.012)	(0.017)	(0.016)
Cog89=1 # Environ. (high, 3d)				-0.025	-0.014	-0.007
				(0.018)	(0.019)	(0.018)
Schooling	0.080***	0.039***	0.039***	0.079***	0.039***	0.038***
	(0.003)	(0.005)	(0.005)	(0.003)	(0.005)	(0.005)
Potential Experience	0.074***	0.050***	0.050***	0.074***	0.050***	0.050***
	(0.007)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)
Pot. exp. (squared)	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	583,195	539,196	539,196	583,195	539,196	539,196
Peer-group			Ind3			
Sample			All			
Occupation f.e.	No	Occ4 -Year	Occ4 -Year	No	Occ4 -Year	Occ4 -Year
Firm-year f.e.	No	No	Yes	No	No	Yes
R-squared	0.324	0.464	0.473	0.317	0.461	0.471

Table 3: Descriptive statistics (Administrative employer-employee matched data)

This table reports descriptive statistics of the main variables used in the worker-level analysis. Public sector workers are excluded. Panel A examines the wage-related data for the sample of the whole universe of private sector firms for which our survey measure of sustainability is available. Panel B shows corresponding summary statistics for the sample of firms for which we have sector-level greenhouse gas emission data. Please note emission data is only available for a subset of 57 two-digit sectors. Detailed definitions and explanations of all variables are provided in Online Appendix Table A.1.

Panel A: Demographic and education variables (Survey sample)

	Obs in millions	mean	sd	p10	p25	p50	p75	p90
Age	17.15	41.26	10.60	27.00	33.00	41.00	49.00	56.00
Schooling	17.15	12.24	2.39	9.00	10.50	12.00	13.50	16.00
Pot. Exp.	17.15	22.20	10.72	8.00	14.00	22.00	30.50	37.00
Cog. Skills	17.15	5.20	1.89	3.00	4.00	5.00	7.00	8.00
Cog. = 8 or 9 (d)	17.15	12%	33%	0%	0%	0%	0%	100%
Non-cog. Skills	17.15	5.11	1.70	3.00	4.00	5.00	6.00	7.00
Non-cog. = 8 or 9 (d)	17.15	8%	26%	0%	0%	0%	0%	0%
Ln(Wages)	17.15	7.92	0.57	7.32	7.70	7.95	8.21	8.52
Sustain. (high)	17.15	31%	46%	0%	0%	0%	100%	100%
Sustain. (quint.)	17.15	3.37	1.36	2.00	2.00	3.00	5.00	5.00
Physical demanding. (high)	17.15	13%	34%	0%	0%	0%	0%	100%
Work-life balance (high)	17.15	34%	47%	0%	0%	0%	100%	100%
Career opportunities (high)	17.15	33%	47%	0%	0%	0%	100%	100%
Job security (high)	17.15	38%	49%	0%	0%	0%	100%	100%
Governance (high)	17.15	37%	48%	0%	0%	0%	100%	100%
Social responsibility (high)	17.15	33%	47%	0%	0%	0%	100%	100%

Panel B: Demographic and education variables (Emission sample)

	Obs in millions	mean	sd	p10	p25	p50	p75	p90
Age	10.81	43.54	10.49	29.00	36.00	44.00	52.00	58.00
Schooling	10.81	12.36	2.40	9.00	10.50	12.00	13.50	16.00
Pot. Exp.	10.81	24.42	10.72	9.50	16.00	25.00	33.00	39.00
Cog. Skills	10.81	5.21	1.88	3.00	4.00	5.00	7.00	8.00
Cog. = 8 or 9 (d)	10.81	12%	33%	0%	0%	0%	0%	100%
Non-cog. Skills	10.81	5.10	1.69	3.00	4.00	5.00	6.00	7.00
Non-cog. = 8 or 9 (d)	10.81	7%	26%	0%	0%	0%	0%	0%
Ln(Wages)	10.81	8.01	0.54	7.47	7.80	8.02	8.28	8.58
Sustain. (high)	10.81	26%	44%	0%	0%	0%	100%	100%
Sustain. (quint.)	10.81	2.58	1.11	1.00	2.00	3.00	4.00	4.00

Table 4: The Sustainability Wage Gap – Baseline results

The table shows results from estimating Mincerian-like wage regressions. The dependent variable is log of wage. The main independent variable is the dummy variable *Sustain. (high)* which equals one if the industry belongs to the top quintile of the sustainability distribution (i.e., most sustainable sectors) in terms of our survey measure or based on sector-level greenhouse gas emissions. Panel A estimates the Sustainability Wage Gap for a selected set of occupations that exist in virtually all sectors (e.g., secretaries or receptionists, human resource professionals, accountants, etc.). In the regressions, we control for years of schooling and potential experience, year fixed effects, and fixed effects capturing different levels of cognitive and non-cognitive skills. Panel B uses the full sample of male workers. In columns (1) to (4), the sustainability dummy is based on our survey measure. In columns (5) and (6) on sector-level GHG emissions. In Panel C we use individual dummies *Survey=1* and *Emission=1* (and their interactions) that identify whether the sector belongs to the top sustainability sectors based on the survey and the greenhouse gas emissions measures. All variables are described and explained in Online Appendix Table A.1. Standard errors are clustered at the firm-level. ***, **, * indicates statistical significance at the 1, 5 and 10% level, respectively.

Panel A: Selected occupations

	Ln(Wages)					
	(1)	(2)	(3)	(4)	(5)	(6)
Sustain. (high)=1	-0.127***	-0.190***	-0.070***	-0.113***	-0.162***	-0.115***
	(0.018)	(0.016)	(0.027)	(0.016)	(0.024)	(0.012)
Schooling	0.014***	0.026***	0.023***	0.049***	0.037***	0.094***
	(0.003)	(0.003)	(0.002)	(0.002)	(0.005)	(0.002)
Potential Experience	0.059***	0.051***	0.054***	0.066***	0.067***	0.073***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)
Pot. Exp. (squared)	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	40,103	41,656	31,888	91,919	24,420	156,026
Sustain. Measure			Survey			
Sample	Receptionists	HR	IT	Accountants	Legal	Executives
Municipality f.e			Municipality – Year			
Skills f.e.			Cog./Non-cog.			
R-squared	0.359	0.377	0.422	0.287	0.293	0.277

Panel B: Full sample

	(1)	(2)		(3)	(4)		(5)	(6)
	Ln(Wages)						
Sustain. (high)=1	-0.126***			-0.087***			-0.057***	
	(0.008)			(0.005)			(0.007)	
Sust. Quintile = 2		-0.030***			-0.037***			-0.025***
		(0.008)			(0.007)			(0.008)
Sust. Quintile = 3		-0.024***			-0.037***			-0.062***
		(0.008)			(0.007)			(0.007)
Sust. Quintile = 4		-0.055***			-0.073***			-0.088***
		(0.009)			(0.008)			(0.007)
Sust. Quintile = 5		-0.159***			-0.133***			-0.124***
		(0.010)			(0.009)			(0.009)
Schooling	0.047***	0.047***		0.027***	0.027***		0.024***	0.024***
	(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
Potential Experience	0.052***	0.052***		0.046***	0.046***		0.044***	0.044***
	(0.001)	(0.001)		(0.000)	(0.000)		(0.000)	(0.000)
Pot. Exp. (squared)	-0.001***	-0.001***		-0.001***	-0.001***		-0.001***	-0.001***
	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
Obs	2,538,809	2,538,809		17,148,693	17,148,693		10,813,955	10,813,955
Sustain. Measure	\multicolumn{2}{c}{Survey}			\multicolumn{2}{c}{Survey}			\multicolumn{2}{c}{Emission}
Sample	\multicolumn{2}{c}{Generic}			\multicolumn{2}{c}{All}			\multicolumn{2}{c}{All}
Occupation f.e.				Occ4 – Year				
Municipality f.e				Municipality – Year				
Skills f.e.				Cog./Non-cog.				
R-squared	0.466	0.466		0.429	0.430		0.383	0.384

Panel C: Combination of survey and emission measure

	Ln(Wages) (7)
Survey = 1 & Emission = 1	-0.110***
	(0.008)
Survey = 1 & Emission = 0	-0.099***
	(0.006)
Survey = 0 & Emission = 1	-0.047***
	(0.008)
Schooling	0.025***
	(0.001)
Potential Experience	0.044***
	(0.000)
Pot. Exp. (squared)	-0.001***
	(0.000)
Obs	10,603,425
Sample	All
Occupation f.e.	Occ4 – Year
Municipality f.e	Municipality – Year
Skills f.e.	Cog./Non-cog.
R-squared	0.388

Table 5: The Sustainability Wage Gap – Fixed Effects & Turnovers

In column (1), we estimate a worker fixed-effects model. The dependent variable is log of wage which is regressed on the dummy variable *Sustain. (high)*, which equals one if the industry belongs to the top quintile of the sustainability distribution (i.e., most sustainable sectors). In columns (2) to (4) we examine job switchers after bankruptcies and mass layoffs. The dependent variable is the change in log wage. *Ch. in sustainability* is a variable that takes on the value of -1 if a worker moves into a sector of lower sustainability, 0 if the worker remains in a sector of the same sustainability, and +1 if the worker moves into a sector of higher sustainability. *Sustain. (high) – up* is a dummy variable that takes on the value of 1 if the worker switches to a sector of higher sustainability and 0 otherwise. *Sustain. (high) – down* is a corresponding dummy variable which is equal to one if following the bankruptcy or layoff the worker switches into a sector of lower sustainability. All variables are described and explained in Online Appendix Table A.1. Standard errors are clustered at the firm-level. ***, **, * indicates statistical significance at the 1, 5 and 10% level, respectively.

	Ln(Wages)	Change in wages (log-diff,[-1,+1])		Change in wages (log-diff,[-1,+1])	
	(1)	(2)	(3)	(4)	(5)
Sustain. (high)=1	-0.056***				
	(0.003)				
Ch. in sustainability		-0.043***		-0.065***	
		(0.002)		(0.019)	
Sustain. (high) - up			-0.061***		-0.074***
			(0.004)		(0.025)
Sustain. (high) - down			0.024***		0.049*
			(0.003)		(0.027)
Schooling	0.044***	0.002***	0.002***	-0.005	-0.005
	(0.003)	(0.000)	(0.000)	(0.004)	(0.004)
Potential Experience	-0.008***	-0.010***	-0.010***	-0.004	-0.004
	(0.003)	(0.000)	(0.000)	(0.003)	(0.003)
Pot. exp. (squared)	-0.001***	0.000***	0.000***	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	17,055,018	439,991	439,991	11,800	11,800
Sustain. measure			Survey		
Sample			All		
Event	No	First position after mass layoff		First position after bankruptcy	
Occupation f.e.			Occ4 – Year		
Municipality f.e			Municipality - Year		
Skills f.e.	No		Cog./Non-cog.		
Person f.e.	Yes		No		
R-squared	0.710	0.049	0.050	0.316	0.316

Table 6: Skills and cohort effects

This table explores cross-sectional and time-series heterogeneity in the Sustainability Wage Gap. Specifically, the table displays differential effects of sustainability on wages for groups with various skill levels and over time. Panel A focuses on groups of different levels of cognitive and non-cognitive skills (columns 1 and 2) and over time (column 3). The dummy variables *Cog89* (*NonCog89*) identify the 5% workers with the highest cognitive (non-cognitive) skills. *2005-2008, 2009-2012*, and *2013- 2017* are time period indicators (*2001-2004* is the omitted period). In Panel B, we estimate specifications with triple interactions to test the hypothesis that the Sustainability Wage Gap for highly skilled workers is increasing over time. All variables are defined and explained in Online Appendix Table A.1. Standard errors are clustered at the firm-level. ***, **, * indicates statistical significance at the 1, 5 and 10% level, respectively.

Panel A: The Sustainability Wage Gap for skilled workers *and* over time

	Ln(Wages)		
	(1)	(2)	(3)
Cog89=1	0.023***		
	(0.002)		
Cog89=1 # Sustain. (high)=1	-0.016***		
	(0.004)		
Noncog89=1		0.071***	
		(0.002)	
Noncog89=1 # Sustain. (high)=1		-0.010***	
		(0.00)3	
2005-2008 # Sustain. (high)=1			-0.015***
			(0.003)
2009-2012 # Sustain. (high)=1			-0.022***
			(0.004)
2013-2017 # Sustain. (high)=1			-0.033***
			(0.005)
Schooling	0.023***	0.023***	0.021***
	(0.001)	(0.001)	(0.001)
Potential Experience	0.045***	0.045***	0.044***
	(0.000)	(0.000)	(0.000)
Pot. Exp. (squared)	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
Obs	16,211,824	16,211,824	17,026,993
Sustain. measure		Survey	
Sample		All	
Occupation f.e.		Occ4 – Year	
Municipality f.e		Municipality – Year	
Skills f.e.	No	No	Yes
Firm-year f.e.		Firm-year	Firm
R-squared	0.577	0.578	0.557

Panel B: The Sustainability Wage Gap for skilled workers over time

	ln(Wages)	
	(4)	(5)
Cog89=1 # Sustain. (high)=1	-0.007	
	(0.006)	
Cog89=1 # Sustain. (high)=1 # 2005-2008	-0.007**	
	(0.003)	
Cog89=1 # Sustain. (high)=1 # 2009-2012	-0.011***	
	(0.004)	
Cog89=1 # Sustain. (high)=1 # 2013-2017	-0.015***	
	(0.006)	
Noncog89=1 # Sustain. (high)=1		-0.001
		(0.004)
Noncog89=1 # Sustain. (high)=1 # 2005-2008		-0.010**
		(0.004)
Noncog89=1 # Sustain. (high)=1 # 2009-2012		-0.010**
		(0.004)
Noncog89=1 # Sustain. (high)=1 # 2013-2017		-0.012***
		(0.005)
Obs	16,211,824	16,211,824
Sustain. measure	Survey	
Sample	All	
Occupation f.e.	Occ4 – Year	
Municipality f.e	Municipality – Year	
Skills f.e.	No	
Firm-year f.e.	Firm-year	
R-squared	0.565	0.566

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Table 7: Effort and Work-Life Balance

This table presents evidence on the relation between hours worked and our sector-level sustainability measure. The data on hours worked used in columns (1)-(3) comes from a large labor force survey. In columns (4) to (6), we add sector-level ratings for work-life balance and career opportunities. These measures are collected through our Prolific survey. In the survey, we ask the respondents to characterize sectors in terms of other compensating differentials. Similar in spirit to the sector-level sustainability classifications, each survey respondent is asked to rate ten randomly selected sectors in terms of issues such as whether working in the sector would, for instance, allowed for good work-life balance (see Section V of the survey instrument in Online Appendix Section 4 for further background). All variables are described and explained in Online Appendix Table A.1. Standard errors are clustered at the firm- level. ***, **, * indicates statistical significance at the 1, 5 and 10% level, respectively.

	#hours	>50h (d)	>60h (d)	#hours	>50h (d)	>60h (d)
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Sustain. (high)=1	0.334***	0.014***	0.016***	0.444***	0.023***	0.020***
	(0.055)	(0.003)	(0.002)	(0.057)	(0.003)	(0.002)
Work-life balance (high, 3d)				-0.354***	-0.024***	-0.012***
				(0.042)	(0.002)	(0.001)
Career opp. (high, 3d)				-0.074*	-0.008***	-0.005***
				(0.042)	(0.002)	(0.001)
Schooling	0.341***	0.018***	0.004***	0.341***	0.018***	0.004***
	(0.027)	(0.001)	(0.001)	(0.027)	(0.001)	(0.001)
Potential Experience	0.197***	0.010***	0.004***	0.196***	0.010***	0.004***
	(0.009)	(0.000)	(0.000)	(0.009)	(0.000)	(0.000)
Pot. exp. (squared)	-0.003***	-0.000***	-0.000***	-0.003***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	487,584	487,584	487,584	487,584	487,584	487,584
Sample	Labor force survey			Labor force survey		
Skills	N/A			N/A		
Occ. - year f.e.	Hunyk83/Husky4			Hunyk83/Husky4		
R-squared	0.117	0.111	0.066	0.118	0.112	0.067

Table 8: Career Opportunities

Panel A of this table presents evidence on the relation between our sector-level sustainability measure and different measures of wage profiles. Columns (1) to (4) analyse the Sustainability Wage Gap for different age groups (age group of 30, 40, 50, and 60, respectively – see third row). Columns (5) to (7), follow cohorts of 30-years old and analyse their wages at the ages of 30, 40, and 50, respectively. The sector allocation is, hence, measured at the age of 30 years. Importantly, we do not condition that workers remain in the same sector. Besides standard Mincerian controls, we also include sector-level ratings for work-life balance and career opportunities. These measures are collected through our Prolific survey. In the survey, we ask the respondents to characterize sectors in terms of other compensating differentials. Similar in spirit to the sector-level sustainability classifications, each survey respondent is asked to rate ten randomly selected sectors in terms of issues such as whether working in the sector would, for instance, allowed for good work-life balance (see Section V of the survey instrument in Online Appendix Section 4 for further background). In Panel B, we exclude workers who potentially work for startups. Startups are approximated by the age of the firm measured since registration. We use various thresholds of firm age (5, 10, and 20 years) in our definition of a startup. All variables are described and explained in Online Appendix Table A.1. Standard errors are clustered at the firm-level. ***, **, * indicates statistical significance at the 1, 5 and 10% level, respectively.

Panel A: Wage Profiles

	Ln(Wages)						
at age:	(1) 30	(2) 40	(3) 50	(4) 60	(5) 70	(6) 80	(7) 90
Sustain. (high)=1	-0.081***	-0.063***	-0.089***	-0.114***	-0.089***	-0.051***	-0.077**
	(0.005)	(0.006)	(0.007)	(0.008)	(0.006)	(0.007)	(0.036)
Work-life (high, 3d)					-0.009*	-0.015***	-0.020
					(0.005)	(0.006)	(0.031)
Career opp. (high, 3d)					0.027***	0.038***	0.057*
					(0.005)	(0.006)	(0.029)
Schooling	0.017***	0.006***	0.004***	0.006***	0.017***	0.018***	0.025**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.012)
Potential Experience	-0.369***	-0.160***	-0.163***	-0.335***	-0.369***	-0.125***	0.301*
	(0.018)	(0.020)	(0.031)	(0.060)	(0.017)	(0.018)	(0.173)
Pot. exp. (squared)	0.020***	0.004***	0.002***	0.004***	0.020***	0.005***	-0.016*
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.009)
Obs	398,971	541,567	489,277	191,183	398,971	162,637	3,982
Sustain. measure	All 30 yrs.	All 40 yrs.	All 50 yrs.	All 60 yrs.	All 30 yrs.	All 30 yrs.	All 30 yrs.
Sample	All	All	All	All	All	All	All
Cog. / Noncog. skills f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation-year f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-year f.e	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.254	0.397	0.438	0.376	0.283	0.280	0.302

Panel B: Excluding Startups

	Ln(Wages)		
	(1)	(2)	(3)
Sustain. (high)=1	-0.070***	-0.071***	-0.070***
	(0.007)	(0.008)	(0.010)
Schooling	0.027***	0.026***	0.026***
	(0.001)	(0.001)	(0.001)
Potential Experience	0.047***	0.047***	0.047***
	(0.001)	(0.001)	(0.001)
Pot. exp. (squared)	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
Obs	10,804,404	9,656,236	7,277,501
Sustain. measure	Survey	Survey	Survey
Firm age	>5	>10	>20
Sample	All	All	All
Cog. / Noncg. skills f.e.	Yes	Yes	Yes
Occupation-year f.e.	Yes	Yes	Yes
Municipality-year f.e	Yes	Yes	Yes
R-squared	0.434	0.444	0.464

Table 9: Compensating differentials and alternative explanations

In this table we address compensating differentials and alternative explanations. In columns (1)-(5) we control for survey-based measures for known compensating differentials and the perceived social and governance measures. These measures are collected through our Prolific survey. In the survey, we ask the respondents to characterize sectors in terms of other compensating differentials. Similar in spirit to the sector-level sustainability classifications, each survey respondent is asked to rate ten randomly selected sectors in terms of issues such as whether working in the sector would, for instance, be considered physically demanding or allowed for good work-life balance (see Section V of the survey instrument in Online Appendix Section 4 for further background). In Column (6) we include proxies for different compensating differentials at the industry-level. We calculate the average firing rate at industry-level. We also calculate, at the industry-level, the average number of sick days and the propensity of ending up in the hospital as proxies for health risk or work-life balance. Finally, we compute marriage and divorce rates, the average number of children, and the number of parental leave days as proxies for a good work-life-balance. We then include the industry averages (and their squares) of all these measures as additional sector-level controls in the regression in column (6). We include these sector-level assessments (or ratings) as additional control variables. All variables are described and explained in Online Appendix Table A.1. Standard errors are clustered at the firm-level. ***, **, * indicates statistical significance at the 1, 5 and 10% level, respectively.

	Ln(Wages)					
	(1)	(2)	(3)	(4)	(5)	(6)
Sustain. (high, 3d)	-0.124***			-0.100***	-0.116***	-0.069***
	(0.007)			(0.006)	(0.007)	(0.007)
Social resp. (high, 3d)	-0.014**				-0.031***	
	(0.006)				(0.007)	
Governance (high, 3d)	0.065***				0.061***	
	(0.006)				(0.007)	
Work-life (high, 3d)		-0.021***		-0.005	-0.025***	
		(0.006)		(0.005)	(0.005)	
Career opp. (high, 3d)			0.022***	0.042***	0.017***	
			(0.005)	(0.005)	(0.006)	
Job security (high, 3d)					0.008	
					(0.005)	
Physical dem. (high, 3d)					-0.001	
					(0.004)	
Schooling	0.027***	0.026***	0.026***	0.027***	0.027***	0.026***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Pot. exp.	0.046***	0.047***	0.047***	0.046***	0.046***	0.045***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Pot. exp. (sq.)	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	17,148,693	17,972,601	17,972,601	17,148,693	17,148,693	16,497,904
Sustain. measure	Survey	Survey	Survey	Survey	Survey	Survey
Sample	All	All	All	All	All	All
Industry controls	No	No	No	No	No	Polyn. of ind. avg.
Cog. / Noncg. skills f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Occupation-year f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-year f.e	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.430	0.423	0.423	0.430	0.430	0.415